

Fishery Management Series No. 03-05

**Fishery Management Report for Sport Fisheries in the
Northwest Alaska Management Area, 2000**

by
Fred DeCicco

February 2003

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.

Weights and measures (metric)		General		Mathematics, statistics, fisheries	
centimeter	cm	All commonly accepted abbreviations.	e.g., Mr., Mrs., a.m., p.m., etc.	alternate hypothesis	H_A
deciliter	dL	All commonly accepted professional titles.	e.g., Dr., Ph.D., R.N., etc.	base of natural logarithm	e
gram	g	and	&	catch per unit effort	CPUE
hectare	ha	at	@	coefficient of variation	CV
kilogram	kg	Compass directions:		common test statistics	F, t, χ^2 , etc.
kilometer	km	east	E	confidence interval	C.I.
liter	L	north	N	correlation coefficient	R (multiple)
meter	m	south	S	correlation coefficient	r (simple)
metric ton	mt	west	W	covariance	cov
milliliter	ml	Copyright	©	degree (angular or temperature)	°
millimeter	mm	Corporate suffixes:		degrees of freedom	df
		Company	Co.	divided by	÷ or / (in equations)
Weights and measures (English)		Corporation	Corp.	equals	=
cubic feet per second	ft ³ /s	Incorporated	Inc.	expected value	E
foot	ft	Limited	Ltd.	fork length	FL
gallon	gal	et alii (and other people)	et al.	greater than	>
inch	in	et cetera (and so forth)	etc.	greater than or equal to	≥
mile	mi	exempli gratia (for example)	e.g.,	harvest per unit effort	HPUE
ounce	oz	id est (that is)	i.e.,	less than	<
pound	lb	latitude or longitude	lat. or long.	less than or equal to	≤
quart	qt	monetary symbols (U.S.)	\$, ¢	logarithm (natural)	ln
yard	yd	months (tables and figures): first three letters	Jan,...,Dec	logarithm (base 10)	log
		number (before a number)	# (e.g., #10)	logarithm (specify base)	log ₂ , etc.
Time and temperature		pounds (after a number)	# (e.g., 10#)	mid-eye-to-fork	MEF
day	d	registered trademark	®	minute (angular)	'
degrees Celsius	°C	trademark	™	multiplied by	x
degrees Fahrenheit	°F	United States (adjective)	U.S.	not significant	NS
hour	h	United States of America (noun)	USA	null hypothesis	H_0
minute	min	U.S. state and District of Columbia abbreviations	use two-letter abbreviations (e.g., AK, DC)	percent	%
second	s			probability	P
				probability of a type I error (rejection of the null hypothesis when true)	α
Physics and chemistry				probability of a type II error (acceptance of the null hypothesis when false)	β
all atomic symbols				second (angular)	"
alternating current	AC			standard deviation	SD
ampere	A			standard error	SE
calorie	cal			standard length	SL
direct current	DC			total length	TL
hertz	Hz			variance	Var
horsepower	hp				
hydrogen ion activity	pH				
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT SERIES NO. 03-05

**FISHERY MANAGEMENT REPORT FOR SPORT FISHERIES IN THE
NORTHWEST ALASKA MANAGEMENT AREA, 2000**

by

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February 2003

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	iii
LIST OF FIGURES.....	iii
LIST OF APPENDICES.....	iv
PREFACE.....	1
INTRODUCTION.....	2
Region III Description.....	2
The Alaska Board of Fisheries.....	4
Advisory Committees.....	4
ADF&G Emergency Order Authority.....	4
Region III Sport Fish Division Research and Management Staffing.....	4
The Statewide Harvest Survey.....	5
SECTION I: NORTHWESTERN MANAGEMENT AREA OVERVIEW.....	5
Management Area Description and Its Fisheries Resources.....	5
Seward Peninsula/Norton Sound Sub-area.....	5
Kotzebue/Chukchi Sea Sub-area.....	12
Rural Alaska Sport Fishing.....	14
AYK Sport Fishing Regulations.....	15
Commercial Fisheries.....	15
Subsistence Fisheries.....	21
Alaska Board of Fisheries Activities.....	21
Established Management Plans and Policies.....	29
Major Issues for the Northwestern Management Area.....	30
Access Program.....	31
SECTION II: SEASON SUMMARY FOR 2001.....	31
Commercial and Subsistence Fisheries.....	31
Pink Salmon.....	32
Chum Salmon.....	32
Chinook Salmon.....	32
Coho Salmon.....	33
Arctic Grayling.....	33
Sheefish.....	33
Dolly Varden.....	34
SECTION III: SPORT FISHING EFFORT IN THE NORTHWESTERN MANAGEMENT AREA.....	34
Sport Angling Effort.....	34
SECTION IV: MAJOR NORTHWESTERN AREA FISHERIES OVERVIEW.....	37
Northwestern Alaska Salmon Fisheries.....	39
Regulatory History.....	39
Unalakleet River Salmon Fisheries.....	42
Fishery Description and Historical Perspective.....	42
Recent Fishery Performance.....	42
Sport Fishery Management Objectives.....	45
Current Issues.....	45

TABLE OF CONTENTS (Continued)

	Page
Recent and Ongoing Research and Management Activities	46
Nome Area Roadside Salmon Fisheries	47
Fishery Description and Historical Perspective	47
Recent Fishery Performance	47
Sport Fishery Management Objectives	58
Management History and Recent Board of Fisheries and Management Actions	58
Current Issues	59
Ongoing Research and Management Activities	60
Northwestern Alaska Dolly Varden and Arctic Char	60
Fishery Description and Historical Perspective	60
Recent Fishery Performance	65
Fishery Objectives and Management	66
Fishery Outlook	66
Recent Board of Fisheries and Management Actions	66
Current Issues	68
Ongoing Research and Management Activities	68
Northwestern Alaska Arctic Grayling	69
Fishery Description and Historical Perspective	69
Recent Fishery Performance	72
Fishery Objectives and Management	72
Fishery Outlook	73
Recent Board of Fisheries and Management Actions	73
Current Issues	74
Ongoing Research and Management Activities	74
Kotzebue Sound Sheefish	74
Fishery Description and Historical Perspective	74
Recent Fishery Performance	78
Fishery Objectives and Management	78
Fishery Outlook	78
Recent Board of Fisheries and Management Actions	78
Current Issues	78
Ongoing Research and Management Activities	80
Northwestern Alaska Northern Pike	80
Fishery Description and Historical Perspective	80
Recent Fishery Performance	82
Fishery Management Objectives	84
Fishery Outlook	84
Recent Board of Fisheries and Management Actions	84
Current Issues	84
Ongoing Research Activities	84
ACKNOWLEDGMENTS	84
LITERATURE CITED	84
APPENDIX A: NATIONAL WILD AND SCENIC RIVER IN NWMA	89
APPENDIX B: NORTHWESTERN AREA SPORT FISHING REGULATIONS SUMMARY FOR 2000	91
APPENDIX C: SPORT FISH EMERGENCY ORDERS ISSUED DURING 2000 AND 2001	95

LIST OF TABLES

Table	Page
1. Historic commercial salmon harvests by subdistrict from the Norton Sound district 1980-2000	17
2. Kotzebue district chum salmon commercial harvests and incidental Dolly Varden harvests 1980-2001	22
3. Recent chum salmon escapements in Nome subdistrict streams, 1995-2000	23
4. Salmon biological escapement goals (BEGs) for Norton Sound area streams, 2000	25
5. Subsistence salmon harvests by subdistrict for the Norton Sound district 1980-2000	26
6. Subsistence salmon harvests for the Port Clarence and Kotzebue districts 1980-2000	28
7. Sport fishing effort in the A-Y-K region by management sub-areas 1982-2000	35
8. Sport fishing effort in angler-days for major rivers by sub-area in the Northwest Management Area, 1983-2000	38
9. Northwest Management Area historic salmon harvests by sub-area, 1977-2000	40
10. Sport fish effort, harvest, and catch estimates by species for the Unalakleet River, 1990-2000	43
11. Sport fish effort and harvests by species from the Nome River 1983-2000, and catches 1990-2000	48
12. Sport fish effort and harvests by species from the Fish/Niukluk River 1983-2000, and catches 1990-2000	49
13. Sport fish effort and harvests by species from the Pilgrim River 1983-2000, and catches 1990-2000	51
14. Sport fish effort and harvests by species from the Snake River 1983-2000, and catches 1990-2000	52
15. Sport fish effort and harvests by species from the Solomon River 1983-2000, and catches 1990-2000	53
16. Sport fish effort and harvests by species from the Kuzitrin River 1983-2000, and catches 1990-2000	54
17. Sport fish effort and harvests by species from the Penny River 1983-2000, and catches 1990-2000	55
18. Sport fish effort and harvests by species from the Cripple River 1983-2000, and catches 1990-2000	56
19. Sport fish effort and harvests by species from the Sinuk River 1983-2000, and catches 1990-2000	57
20. Documented subsistence harvests of Dolly Varden in Noatak and Kivalina	62
21. Historic Dolly Varden harvests and catches in NWMA by sub-area, 1977-2000	63
22. Aerial counts of Dolly Varden spawning in the Noatak River and overwintering in the Wulik and Kivalina rivers, 1968-2000	64
23. Historic Dolly Varden and Arctic char harvests in the NWMA by sub-area and river, 1987-2000	67
24. Historic Arctic grayling harvests and catches in Seward Peninsula/Norton Sound waters, 1987-2000	70
25. Historic Arctic grayling harvests and catches in the Kotzebue Sound/Chukchi Sea sub-area, 1989-2000	71
26. Reported subsistence sheefish harvests, Kotzebue district, 1966-2000	77
27. Historic sheefish sport fish harvests and catches from northwest Alaska waters, 1977-2000	79
28. Historic northern pike sport fish harvests and catches in the NWMA by sub-area, 1977-2000	83

LIST OF FIGURES

Figure	Page
1. Map of the sport fish regions in Alaska and the six Region III management areas	3
2. The Northwestern Management Area with lines depicting reporting areas W and X	6
3. The Seward Peninsula/Norton Sound sub-area	7
4. Eastern Norton Sound	8
5. Southern Seward Peninsula with road accessible waters	10
6. National Parks Preserves and Wildlife Refuges in NWMA	11
7. Kotzebue Sound Chukchi Sea sub-area	13
8. Commercial salmon fishing subdistricts in Norton Sound	16
9. The Port Clarence commercial fishing district	19
10. The Kotzebue commercial salmon fishing district	20
11. Sport fishing effort in angler-days within the NWMA by sub-area, 1978-2000	36
12. Dolly Varden and Arctic char distribution in the NWMA	61
13. Sheefish distribution in the NWMA	75
14. Northern pike distribution in the NWMA	81

LIST OF APPENDICES

Appendix	Page
A. National Wild and Scenic Rivers in the NWMA.....	90
B. Northwestern Area sport fishing regulations summary for 2000.	92
C1. Sport Fish emergency order issued at Nome August 31, 2000.....	96
C2. Sport Fish emergency order issued at Fairbanks August 27, 2001.....	97
C3. Sport Fish emergency order issued at Fairbanks August 23, 2001.....	99
C4. Sport Fish emergency order issued at Fairbanks August 20, 2001.....	101
C5. Sport Fish emergency order issued at Nome July 31, 2001.....	103
C6. Sport Fish emergency order issued at Fairbanks June 14, 2001.....	105

PREFACE

The goals of the Sport Fish Division of the Alaska Department of Fish and Game (ADF&G) are to conserve wild stocks of sport fish, to provide a diversity of recreational fishing opportunities, and to optimize social and economic benefits from recreational fisheries. In order to implement these goals the Division has in place a fisheries management process.

This report provides information for the Northwestern Alaska Management Area (NWMA) and is one in a series of reports providing an annual update of fisheries management information about important sport fisheries within Region III. The report is written to make that information available to the State Board of Fisheries, Fish and Game Advisory Committees, the general public, and other interested parties. It presents fisheries assessment information and the management strategies that are developed from that information. In addition, the report includes a description of the fisheries regulatory process, the geographic, administrative, and regulatory boundaries, funding sources, and other information concerning Sport Fish Division management programs within this area.

An annual regional Area Review is conducted in mid-winter during which the current status of important area fisheries are considered and research needs are identified. Fisheries stock assessment research projects are developed, scheduled, and implemented to meet information needs identified by fisheries managers. Projects are planned within a formal operational planning process. Biological information gathered during the course of these research projects is combined with effort information and input from user groups and is used to assess the need for and to develop fisheries management plans and propose regulatory strategies.

Sport Fish Division management and research activities are primarily funded by a combination of State of Alaska Fish and Game (F&G) and Federal Aid in Fisheries Restoration (D-J) monies. The F&G funds are from the sale of fishing licenses. The D-J (Dingle-Johnson, named after the congressmen who wrote the Act) funds are from a Federal tax on fishing tackle and equipment. D-J funds are provided to the states at a match of up to three-to-one with the F&G funds. There is also an amendment to the D-J Act (W-B, for Wallop-Breaux) that provides money to states for boating access projects at the same three-to-one match with F&G funds. Funding Source for W-B money is a tax on boat gas and equipment. Other, additional funding sources can include contracts with various government agencies and the private sector.

This report provides fisheries information for 2000 with preliminary information from the 2001 season. Following the introduction, which includes an overview of the region, this report is organized into four major sections. **Section I** provides an overview of the Northwestern Alaska Management Area. Included is a description of the management area and sub-areas, Board of Fish activities, and management information and activities within the area. **Section II** provides a summary of the most recent fishing season. **Section III** provides effort and harvest results for the management area and sub areas. **Section IV** provides more detailed summaries of major fisheries and activities occurring during the reporting period. Included in these summaries are a fishery description; a description of recent performance of the fishery; a description of recent Board of Fishery actions related to the fishery; a discussion of social or biological issues that may be associated with each fishery; and a description of ongoing research and management activities related to each fishery.

INTRODUCTION

REGION III DESCRIPTION

The Alaska Board of Fisheries (BOF) divides the state into ten regulatory areas for the purpose of organizing the sport fishing regulatory system by drainage and fishery. These areas (different from Regional Management Areas) are described in Title 5 of the Alaska Administrative Code (5 AAC). The Sport Fish Division of the Alaska Department of Fish and Game (ADF&G) divides the state into three administrative Regions with boundaries roughly corresponding to groups of the BOF regulatory areas (Figure 1). Region I is Southeast Alaska. Region II covers portions of Southcentral Alaska, Kodiak, Southwestern Alaska, and the Aleutian Islands. Region III includes two and most of a third of the BOF fishery regulatory areas. They are the Upper Copper and Upper Susitna regulatory area, the Arctic-Yukon-Kuskokwim (AYK) regulatory area, and the Tanana River drainage. The lower Yukon and lower Kuskokwim drainage from the Aniak River downstream and Kuskokwim Bay were added to the region in spring 2000.

Region III is the largest region, encompassing the majority of the landmass of the state of Alaska (Figure 1). The region contains over 1,251,300 km² (485,000 mi²) of land, some of the state's largest river systems (the Yukon, portions of the Kuskokwim, the Colville, Noatak, Kobuk and upper Copper River and upper Susitna River drainages), thousands of lakes, and thousands of miles of coastline and streams. Regional coastline boundaries extend from Sheldon Point in the southwest, around all of western, northwestern and northern Alaska to the Canadian border on the Arctic Ocean. Region III as a whole is very sparsely populated, with the most densely populated center located in the Tanana River valley. Fairbanks (population about 31,000) is the largest community.

For administrative purposes Sport Fish Division has divided Region III into five fishery management areas. They are:

- (1) The Upper Copper/Upper Susitna Management Area (the Copper River drainage and the Susitna River drainage above the Oshetna River).
- (2) The Upper Tanana River Management Area (The Tanana River drainage upstream from Banner Creek and the Little Delta River).
- (3) The Lower Tanana River Management Area (The Tanana River drainage downstream from Banner Creek and the Little Delta River).
- (4) The Northwestern Management Area (Norton Sound, Seward Peninsula and Kotzebue Sound drainages).
- (5) The AYK Management Area (the North Slope drainages, the Yukon River drainage except the Tanana River drainage, and the Kuskokwim River drainage upstream from the Aniak River).
- (6) The Lower Yukon/Lower Kuskokwim (LYLK) Management Area (the Yukon Drainage downstream from Paimute and the Kuskokwim drainage downstream from and including the Aniak River Drainage), which was created and added to Region III in 2000.

Area offices for the six management areas are in Glennallen, Delta Junction, Fairbanks, Nome/Fairbanks, Northwest/Fairbanks, and Bethel.

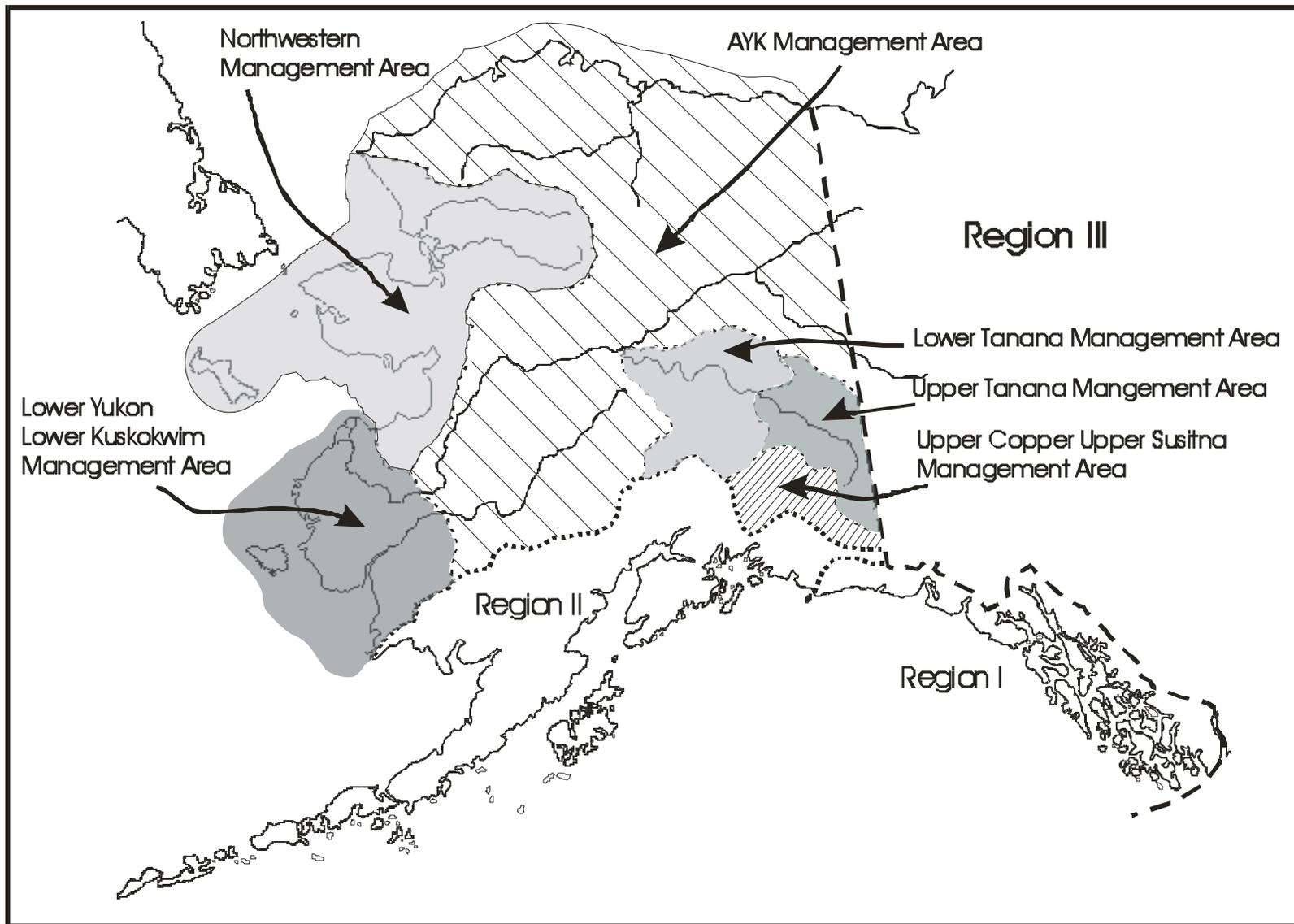


Figure 1.-Map of the sport fish regions in Alaska and the six Region III management areas.

THE ALASKA BOARD OF FISHERIES

The Alaska Board of Fisheries (BOF) is the seven-member board that sets fishery regulations and harvest levels, allocates fishery resources, and approves or mandates fishery conservation plans for the State of Alaska. Board members are appointed by the Governor and must be confirmed by the legislature. Board members are appointed for three years.

Statewide fisheries issues may be considered at any BOF meeting. Under the current operating schedule, the BOF considers fishery issues for regulatory areas or groups of regulatory areas on a 3-year cycle. The BOF meetings are usually in the winter, between early October and late March. Regulation proposals and management plans are received for evaluation by the BOF from ADF&G and the public (any Alaskan can submit a proposal to the BOF), and during its deliberations the BOF receives input and testimony through oral and written reports from staff of the Alaska Department of Fish and Game, members of the general public, representatives of local fish and game Advisory Committees, and special interest groups such as fishermen's associations and clubs.

ADVISORY COMMITTEES

Local Fish and Game Advisory committees have been established throughout the state to assist the Boards of Fish and Game in assessing fisheries and wildlife issues and proposed regulation changes. Advisory committee members are individuals from the local public who are nominated and voted on by all present during an advisory committee meeting. Most active committees in urban areas meet in the fall and winter on a monthly basis; rural committees have generally only one fall and one spring meeting due to funding constraints. Advisory meetings allow opportunity for direct public interaction with department staff who answer questions and provide clarification concerning proposed regulatory changes. The Boards Support Section within the Division of Administration provides administrative and logistical support for the BOF and Fish and Game Advisory Committees. During 2000, the department had direct support responsibilities for 56 Advisory committees in the state.

ADF&G EMERGENCY ORDER AUTHORITY

The ADF&G has emergency order (EO) authority (5 AAC 75.003) to modify time, area, and bag/possession limit regulations. EOs are implemented to deal with conservation issues that are not adequately controlled by existing regulations. In that scenario, they deal with the issue until it is resolved or the BOF can formally take up the issue. EOs are also the mechanism by which "in-season" management of fisheries is accomplished. In-season management is in accordance with a fisheries management plan approved by the BOF when such plans exist.

REGION III SPORT FISH DIVISION RESEARCH AND MANAGEMENT STAFFING

The Region III Sport Fish Division staff biologists are organized into a research group and a management group. The management group consists of a management supervisor, an area management biologist for each of the six management areas, one or more assistant area management biologists, and two stocked waters biologists. The area biologists evaluate fisheries and propose and implement management strategies through plans and regulations in order to meet division goals. A critical part of these positions is interaction with the BOF, Advisory Committees, other agencies, and the general public. The stocked waters biologists plan and implement the regional stocking program for recreational fisheries. The research group consists of a research supervisor, research biologists, and various field assistants. The research biologists

plan and implement fisheries research projects in order to provide information needed by the management group to meet division goals.

The Statewide Harvest Survey

Recreational angling effort, catch and harvest of important sport fish species in Alaska has been estimated and reported annually since 1977 (Mills 1979-1994, Howe et al. 1995, 1996, 2001a-d). The Statewide Harvest Survey (SWHS), a questionnaire mailed out to a random selection of sport fish license holders, is the instrument that provides the data analyzed to make these estimates. Estimates for a particular year usually become available in August and September of the following year. Effort, catch, and harvest are estimated on a site-specific basis, but estimates of effort directed toward a single species and the resulting species-specific catch-per-unit-effort (CPUE) information could seldom be derived from the report. Utility of the estimates is strongly dependant on the number of responses for a site (Mills and Howe 1992). Estimates based on 12 or fewer responses are useful only to document that fishing occurred. Twelve to 29 responses produce estimates useful for indicating relative order of magnitude and for assessing long-term trends, and estimates based on 30 or more responses are generally the most useful in tracking harvest trends.

SECTION I: NORTHWESTERN MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION AND ITS FISHERIES RESOURCES

The Northwest Alaska sport fish management area (Figure 2) includes all waters north of the Yukon River drainage, in Norton Sound, the Seward Peninsula, Kotzebue Sound including the major drainages of the Kobuk and Noatak rivers, and the eastern Chukchi Sea to Point Hope. The total land area consists of approximately 67,800 sq mi (173,500 km²). The management area is comprised of two sub-areas, the Seward Peninsula/Norton Sound sub-area in the south and the Kotzebue /Chukchi Sea sub-area to the north. Fish species present in the Northwest Management Area include anadromous Dolly Varden *Salvelinus malma*, chinook *Oncorhynchus tshawytscha*, coho *O. kisutch*, chum *O. keta*, sockeye *O. nerka* and pink salmon *O. gorbuscha*; Bering cisco *Coregonus laurettae*, humpback whitefish *Coregonus pidschian*, as well as freshwater resident Arctic grayling *Thymallus arcticus*, Dolly Varden *Salvelinus malma*, Arctic char *Salvelinus alpinus*, northern pike *Esox lucius*, sheefish *Stenodus leucichthys*, round whitefish *Prosopium cylindraceum*, least cisco *C. sardinella*, humpback whitefish *C. pidschian*, broad whitefish *C. nasus*, burbot *Lota lota* and lake trout *Salvelinus namaycush*. Most of these species are harvested in sport, personal use or subsistence fisheries. In addition, marine species such as red king crab *Paralithodes camtschatica*, Pacific herring *Clupea harengus*, rainbow smelt *Osmerus mordax*, saffron cod *Eleginus gracilis*, and starry flounder *Platichthys stellatus* are harvested.

Seward Peninsula/Norton Sound Sub-area

The Seward Peninsula-Norton Sound sub-area (statewide harvest Area W; Figure 3) includes all westerly flowing waters and adjacent marine (salt) waters, north of the Yukon River drainage and south of the Selawik River in the Kotzebue Sound/Chukchi Sea sub-area (ADF&G 1984).

Streams in eastern Norton Sound (Figure 4) include the Golsovia, Unalakleet, Egavik, Shaktoolik, Inglutalik, Ungalik and Koyuk rivers. All but the Koyuk, drain the Nulato Hills which separate Norton Sound from the Yukon and Koyukuk River valleys. Of these, the

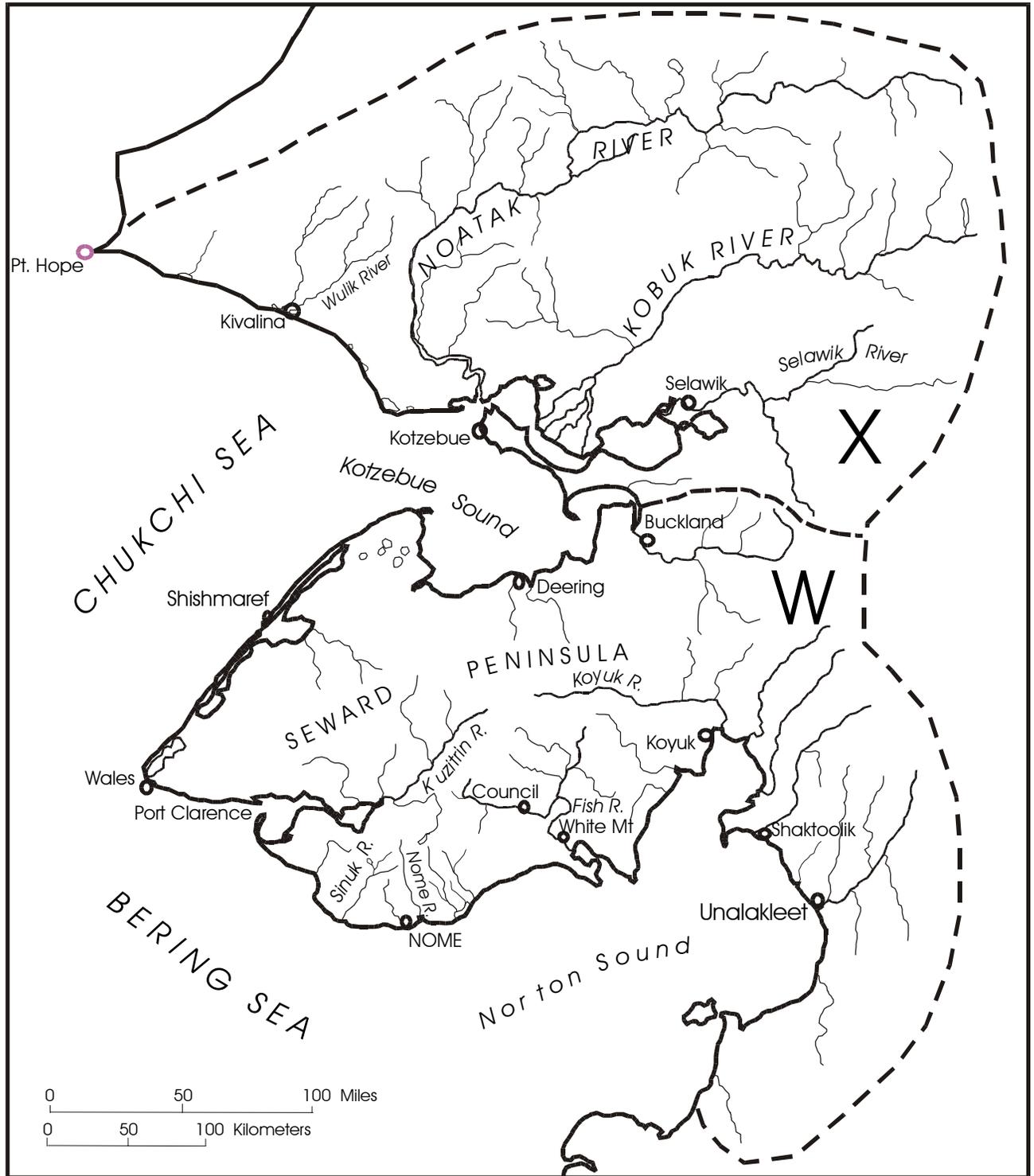


Figure 2.-The Northwestern Management Area with lines depicting reporting areas W and X.

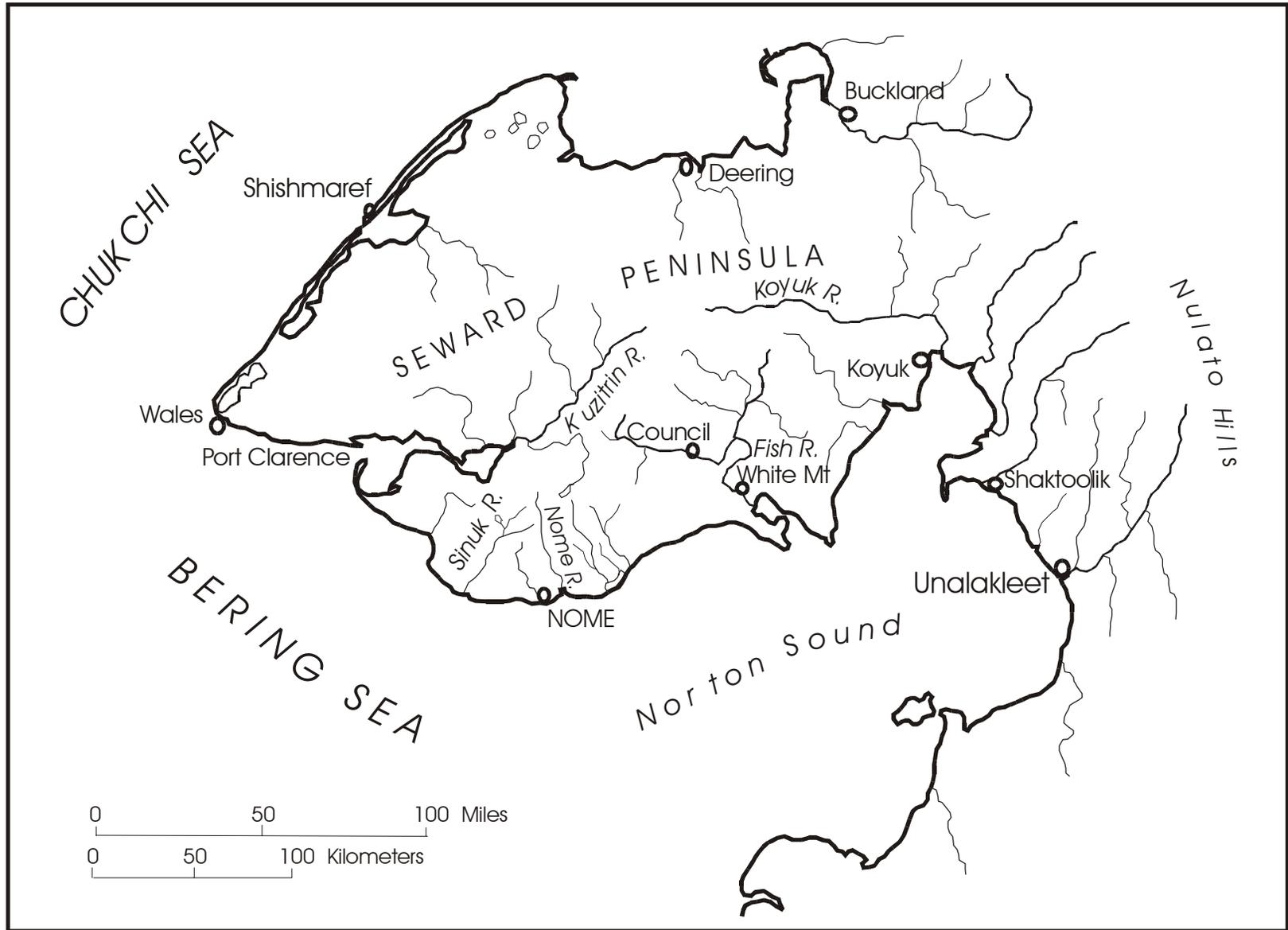


Figure 3.-The Seward Peninsula/Norton Sound sub-area.

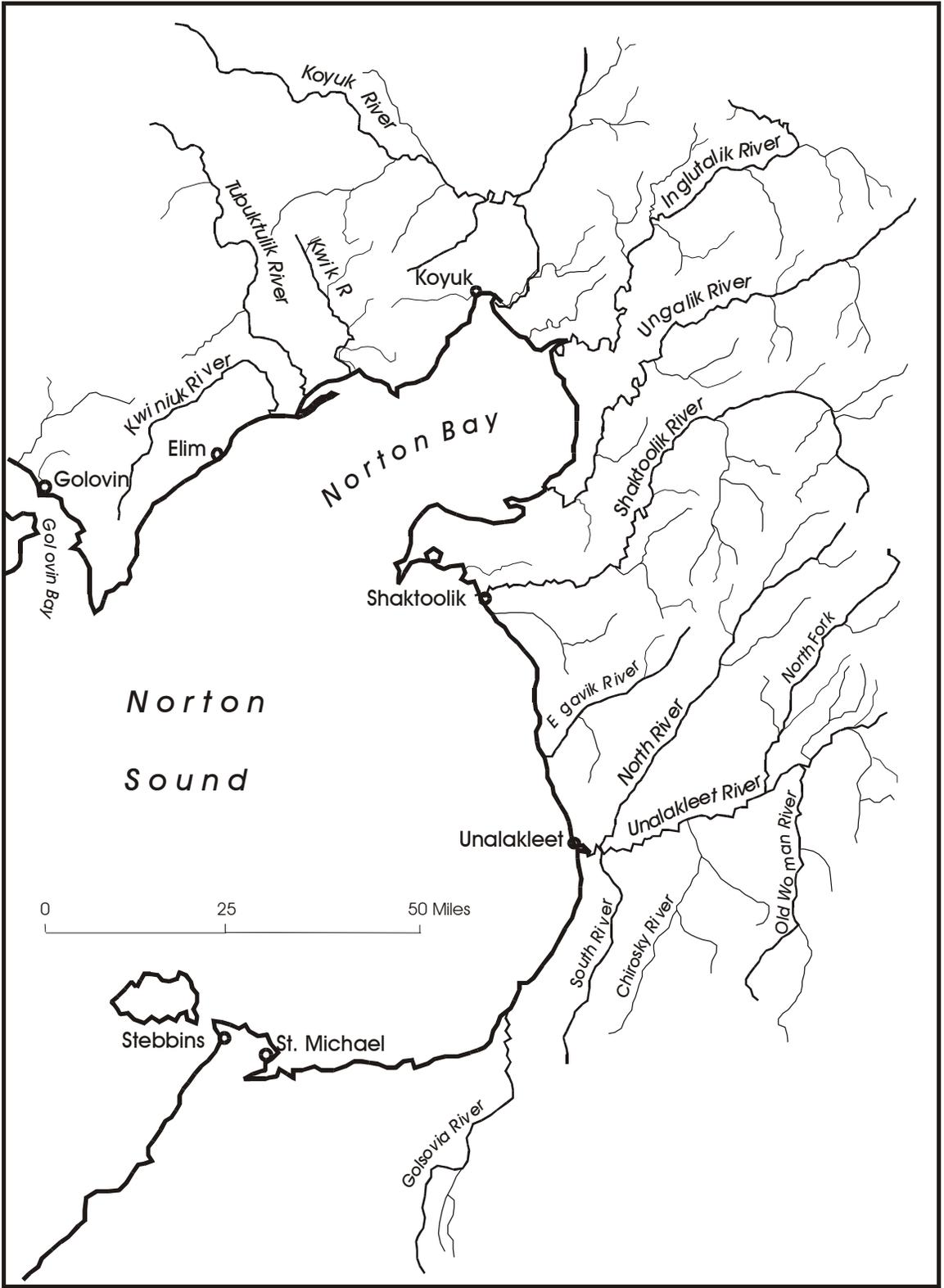


Figure 4.-Eastern Norton Sound.

Unalakleet River is the largest and most heavily utilized. The village of Unalakleet is located at the mouth of this river. The Unalakleet River has been designated a National Wild and Scenic River (Appendix A1) and supports anadromous populations of Dolly Varden, chinook, coho, chum and pink salmon and resident populations of Dolly Varden, Arctic grayling and whitefish *Coregonus sp.* Other area streams provide the opportunity for high quality fisheries for the same species, but are not as intensively fished because of their remote nature and difficult access.

Many streams located along the southern half of the Seward Peninsula between Koyuk and Teller, (Figure 5) including the Fish, Niukluk, Bonanza, Eldorado, Nome, Snake, Sinuk, Feather, Tisuk, Pilgrim, and Kuzitrin rivers, are accessible via the Nome road system and offer sportfishing opportunity for Arctic grayling, Dolly Varden, salmon and northern pike (Fish, Pilgrim and Kuzitrin rivers). Small sockeye salmon runs occur in the Pilgrim and Sinuk rivers, and a few remnant late run sockeye are present in most other locations while chinook salmon are present in the Pilgrim and Fish rivers. Trophy Arctic grayling, larger than 1.4 kg (3 lbs), are present in many Seward Peninsula waters and some of Alaska's largest Arctic grayling have been taken there. Of the 110 largest Arctic grayling registered in the ADF&G trophy fish program, 30 were taken from Seward Peninsula waters, and 20 of those were taken from the Sinuk River. Remote streams such as the Koyuk, Tubutulik, Kwiniuk, and Agiapuk rivers are accessible by aircraft or boat from nearby villages. These rivers receive little sport fishing effort but provide opportunity for remote high quality fisheries.

Most of the streams draining the northern half of the Seward Peninsula have never been visited by division personnel but likely have limited sport fishing potential due to relatively small flow volumes and difficult access. Much of the northwestern Seward Peninsula is part of the Bering Land Bridge National Preserve (Figure 6).

Other than thaw lakes on the northern side of the Seward Peninsula, there are few lakes in the sub-area. Unique lake formations include five maar lakes south of Cape Espenberg. These lakes were formed by sub-permafrost steam explosions and contain a combination of Arctic char, least cisco and sticklebacks. The largest inland water body is Imuruk Lake in the north-central portion of the Seward Peninsula. It is approximately 32 km² in area, and drains northward via the Inmachuk River. This lake is very shallow with a heavy load of suspended volcanic ash. It contains a small population of resident Arctic grayling.

Some small alpine lakes in the Kigluaik Mountains northeast of Nome contain lake resident Arctic char, (Kretsinger 1987) while others contain Dolly Varden (Phillips et al. 1999). Glacial Lake in the Sinuk River drainage contains sockeye salmon and round whitefish while Salmon Lake, located about 150 km northeast of Nome in the headwaters of the Pilgrim River, contains sockeye salmon, Arctic grayling, round whitefish, least cisco, slimy sculpin, ninespine stickleback, burbot and Dolly Varden which use it as a migration corridor (DeCicco 1995). Even though this lake can be reached by road, it receives little sport fishing use. However, during the first half of the century it was an important fishing area for gold miners in the area and sockeye were nearly extirpated from the drainage. Subsistence fishing for salmon in Salmon Lake has been prohibited for many years because the sockeye stock was practically eliminated by early fisheries. The sockeye population has been recovering during recent years, however, fishing for salmon in the lake and its tributaries is prohibited.

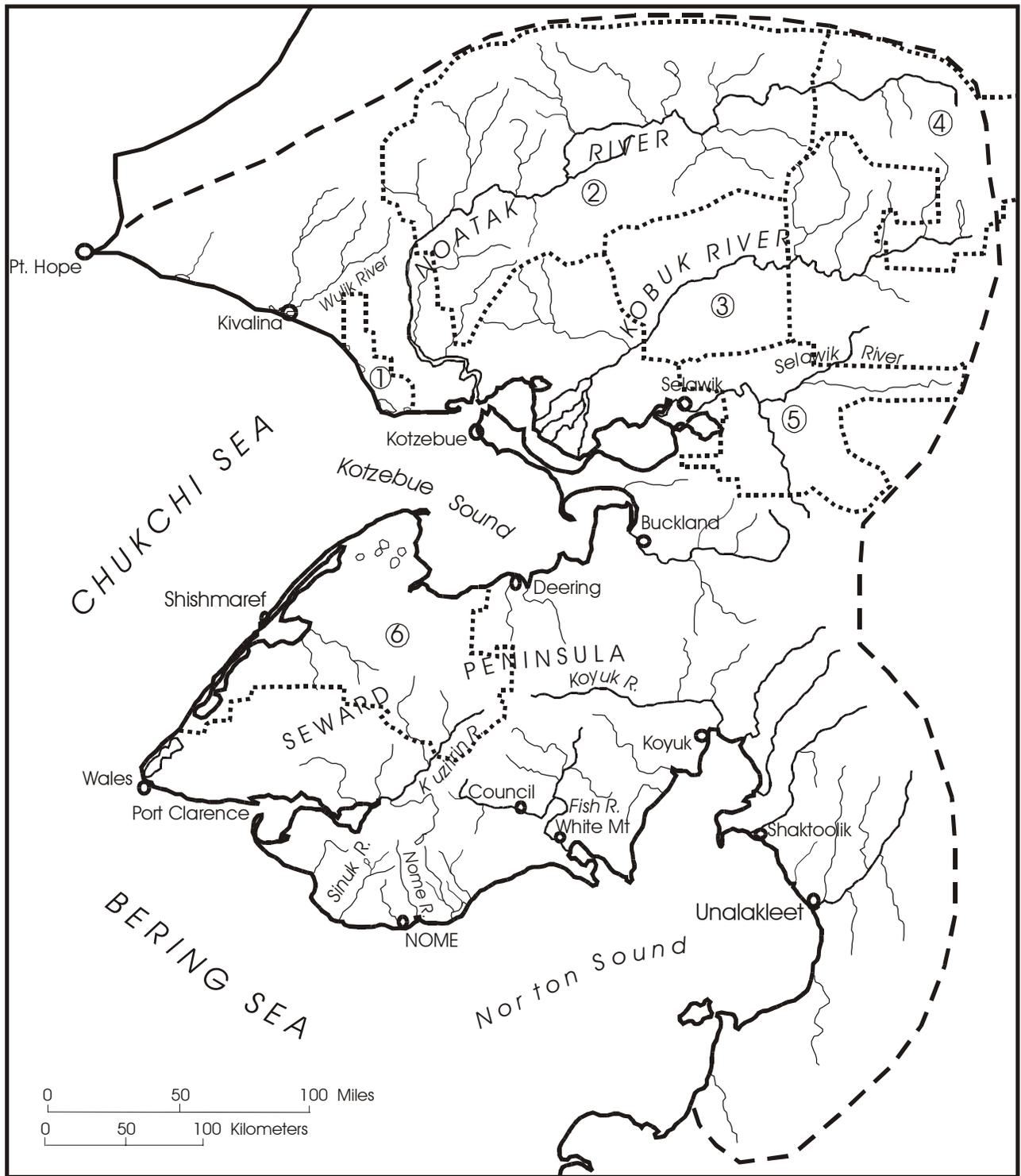


Figure 6.-National Parks Preserves and Wildlife Refuges in NWMA. 1) Cape Krusenstern National Monument, 2) Noatak National Preserve, 3) Kobuk Valley National Park and Preserve, 4) Gates of the Arctic National Park, 5) Selawik National Wildlife Refuge, and 6) Beringland Bridge National Preserve.

Kotzebue/Chukchi Sea Sub-Area

The Kotzebue/Chukchi Sea sub-area, statewide harvest Area X, includes all waters and drainages of the Selawik, Kobuk, Noatak, Wulik, Kivalina and Kukpuk rivers (Figure 7). The area also includes all salt waters from the northern half of Eschscholtz Bay, including the Chamisso Island area and the northern half of Kotzebue Sound to and including Point Hope (ADF&G 1984).

The most important streams of Kotzebue/Chukchi Sea sub-area are the Noatak and Kobuk rivers, each of which drains approximately 12,000 sq mi (31,000 km²) of the southern and western slopes of the western Brooks Range. Both rivers are approximately 400 mi (640 km) in length (U.S. Army Corps of Engineers 1967). The third largest drainage is that of the Selawik River, with an approximate area of 4,600 sq mi (11,700 km²). Aquifers provide groundwater that serves to stabilize flow and water temperature fluctuations on the lower main stem of the Noatak River and in tributaries of the Kobuk River. These areas provide important overwintering and spawning habitats for many species of fish.

The Noatak River is a National Wild and Scenic River (Appendix A1) and most of the drainage is included in the Noatak National Preserve (Figure 6). The extreme upper headwaters of both the Noatak and Kobuk rivers are included in the Gates of the Arctic National Park. A portion of the lower Kobuk Valley between the villages of Kiana and Ambler is included in the Kobuk Valley National Park, and the Salmon River tributary, as well as the upper main stem of the Kobuk River are National Wild and Scenic Rivers as is the Selawik River. Much of the Selawik River valley is part of the Selawik National Wildlife Refuge. These three large river systems contain abundant fisheries resources.

The Noatak River produces a large run of chum salmon that contributes to a Kotzebue-based commercial fishery. Many thousands of anadromous Dolly Varden overwinter the lower 300 km of the river and spawn in some of the river's tributary streams. During the commercial salmon fishery in August a significant incidental harvest of adult Dolly Varden is sometimes taken. This system is known for its trophy size Dolly Varden. The fish that held the State of Alaska record for Dolly Varden/Arctic char from 1991 to 2000 (19.75 lbs.) was taken from the Kelly River in the Noatak River drainage. Whitefish, Arctic grayling, Dolly Varden, lake trout, Arctic char, burbot and northern pike are resident in the Noatak River drainage. Sheefish use the lower reaches of the river for feeding during the spring of the year, but are not known to spawn there (Alt 1987).

The Kobuk River also supports a large run of chum salmon that contributes to the Kotzebue commercial fishery. Major spawning areas are located in many of the Kobuk's tributary streams and in the upper part of the main stem of the river. The Kobuk River contains the largest spawning population of sheefish in northwestern Alaska. Sheefish migrate upstream 300 to 400 miles to spawn in the upper reaches of the drainage. Hotham Inlet, Selawik Lake and the delta system at the river's mouth serve as winter feeding areas for juvenile and adult sheefish. The Alaska state record sheefish, 24 kg (53 lbs), was taken in 1986 from the upper Kobuk River. Abundant whitefish (*C. sardinella*, *C. nasus*, *C. pidschian*) utilize the river, including Selawik Lake and Hotham Inlet (Kobuk Lake). Whitefish support important subsistence fisheries in villages along the river. Dolly Varden, northern pike, Arctic grayling, burbot, lake trout and Arctic char inhabit various parts of the Kobuk watershed.

The Selawik River also supports a spawning population of sheefish that shares rearing and winter feeding areas with the Kobuk population. Sheefish in both populations are slower growing, but

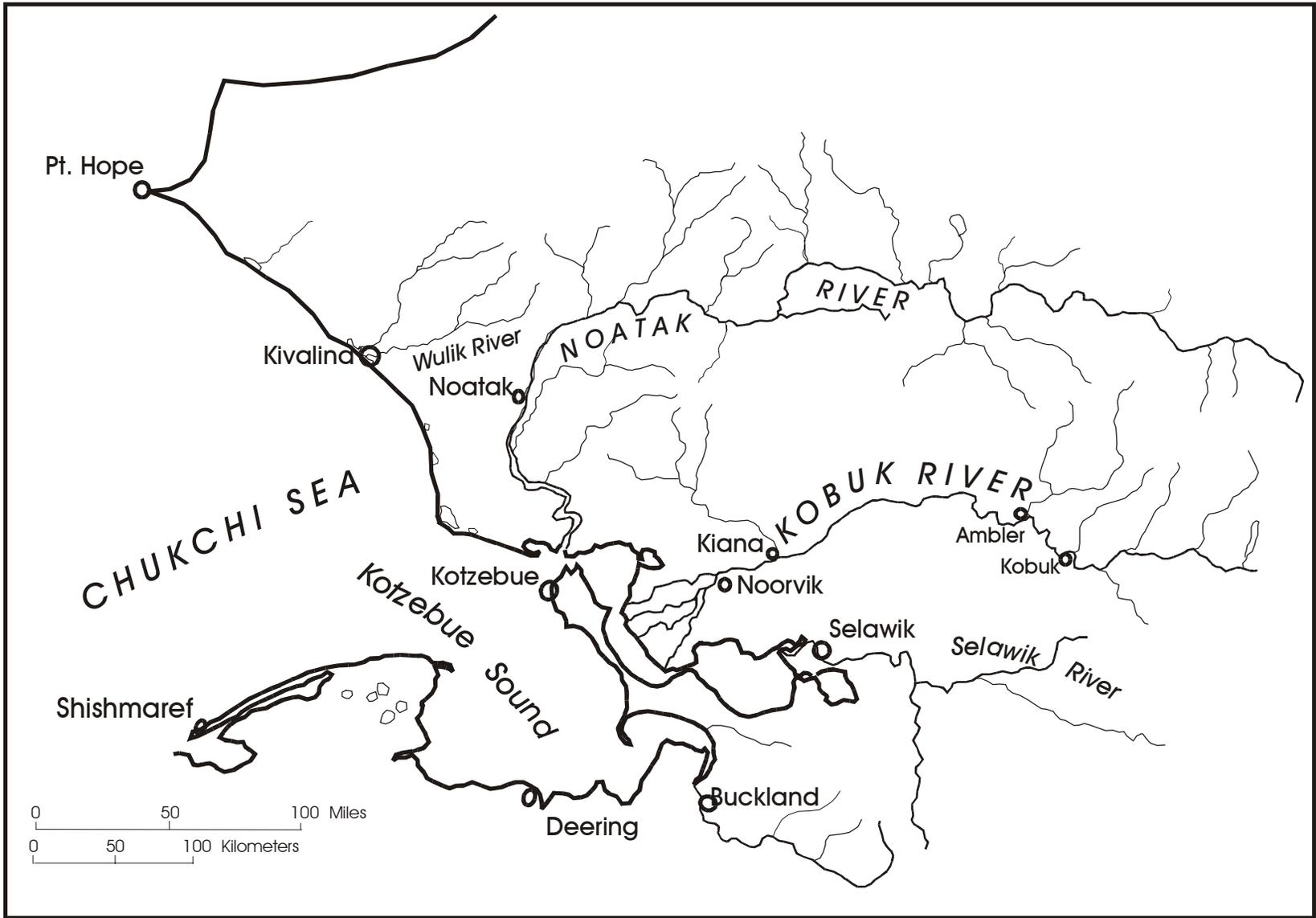


Figure 7.-Kotzebue Sound Chukchi Sea sub-area.

attain a larger size than those in other areas of Alaska (Alt 1987). The Selawik River drainage and associated wetlands provide abundant habitat for whitefish (*C. sardinella*, *C. nasus*, *C. pidscian*) and northern pike.

Other important waters in the sub-area include the Wulik and Kivalina rivers, that drain into the Chukchi Sea near the village of Kivalina. These drainages provide rearing, spawning and winter habitat for diadromous Chukchi Sea Dolly Varden. All five species of North American Pacific salmon, Arctic grayling, burbot and whitefish also occur in these relatively small drainages, but populations are not large.

Sport fishing effort in the northern part of the NWMA is relatively light compared to most other areas in the state with heaviest use on the Noatak, Kobuk, and Wulik rivers. Many visitors to Gates of the Arctic National Park and Kobuk Valley National Park participate in float trips on the Kobuk River from Walker Lake to Kobuk village (Alt 1984; ADF&G 1986; National Park Service (NPS) 1984, 1985). A small amount of shore based sport fishing for sheefish takes place near Kotzebue in the summer. Guided and unguided anglers and river floaters use the Noatak River as do Kotzebue area residents who boat or fly to different parts of the river to fish or hunt. The most popular fishing area on the Noatak River is the Kelly River, but other tributaries such as the Nimiuktuk and Kugururok rivers are also used occasionally for Dolly Varden fishing (Alt 1978). Raft, canoe, and kayak trips are becoming increasingly popular. Arctic grayling, Dolly Varden, northern pike and lake trout are available in the upper Noatak River, and downstream from the Nimiuktuk River, chum salmon also occur. Lake trout occur in Matcharak, Feniak, and Desperation lakes and in some other lakes in the middle and upper Noatak drainage. Some lakes also contain Arctic char or Dolly Varden. Most lakes in the area are accessible during summer months only by floatplane. Thirteen lakes surveyed by Alt (1978) in the upper Noatak River all contained fish. Round whitefish, lake trout and Arctic grayling were the most common species. Least cisco, northern pike, Arctic char, slimy sculpin *Cottus cognatus*, salmon (chum and sockeye), and ninespine stickleback *Pungitius pungitius* were also found. Of six lakes surveyed in 2000, two contained resident populations of Dolly Varden.

The lower floodplains of the Kobuk and Selawik rivers, especially in the vicinity of the Kobuk River delta, and the lower Noatak River contain hundreds of shallow thaw lakes of various sizes. Fisheries resources in this area have been poorly inventoried, but populations of whitefish, and northern pike are known to be seasonally present. Dolly Varden spawn in several Kobuk River tributary streams, including the Squirrel, Salmon, Tutuksuk, Hunt and Ambler rivers. The mountains in the upper Kobuk River drainage contain several relatively large, oligotrophic lakes. Lake trout, Arctic grayling, Arctic char, northern pike and several species of whitefish inhabit these lakes which include Walker Lake, Nutuvukti Lake, and Selby Lake.

Most sport fishing throughout the region is by unguided private individuals. The sport fish guiding industry, while present in many of the region's best fishing waters, is not as large or well developed as in other parts of the state. DeCicco and Barnes (1992) produced a list of guide services by area, species and fishery.

RURAL ALASKA SPORT FISHING

With the exception of the limited road system around Nome, waters of the Northwestern Management Area are not accessible from highways or roads of any kind. Small communities are scattered along the major river systems of the area and along the coast of western Alaska. The communities are invariably located on or near water because of the importance of fish as a

food source to native people historically and today. Native residents harvest a substantial amount of fish and game resources for personal subsistence use. Subsistence fishing is usually conducted using nylon gillnets or seines. Fishing with rod and reel is also practiced to some extent by rural residents, but most often as an extension of subsistence activities and less for recreational purposes. Consequently, harvest estimates of sport caught fish from rural Alaska are generally low, in part because local residents usually fish under subsistence regulations and because the small amount of sport fishing done by them is often considered as part of their normal subsistence activities. Since statewide harvest estimates are based upon surveys of licensed sport fishers, rural harvests may not be fully documented.

AYK SPORT FISHING REGULATIONS

Published regulations for the Northwestern Management Area for 2000 are reproduced as Appendix B.

COMMERCIAL FISHERIES

Although small when compared to the major commercial fisheries in southeast and southwest Alaska, the commercial fisheries in northwest Alaska form an economic base for income and employment in many local communities. Commercial harvests for salmon, herring, halibut and crab are much larger than sport harvests for those species. In addition, extremely limited commercial fisheries exist for freshwater species such as sheefish, Dolly Varden and whitefish. Although personal use fisheries are also allowed, there has been no participation in these fisheries in the NWMA largely because all Alaska residents qualify as subsistence users. Subsistence harvests of salmon, Dolly Varden, sheefish, whitefish and crab are very important to the economies of the many small villages in the NWMA, and are much larger than the sport fish harvests which make up the smallest component of overall use in most years.

The Division of Commercial Fisheries Management and Development (CFMD) manages commercial fisheries in the Northwestern Management Area. Commercial fisheries for salmon in the Norton Sound management district have been ongoing since 1961. The initial species of interest were chinook and coho, but fisheries have also developed for chum and pink salmon. The district is divided into six subdistricts to facilitate management of individual stocks or stock groups. Subdistricts include: 1) Nome, 2) Golovin, 3) Moses Point, 4) Norton Bay, 5) Shaktoolik, and 6) Unalakleet (Figure 8). Conservation concerns for chum salmon stocks have resulted in very little commercial salmon fishing in the Nome subdistrict since the early 1980s. There has likewise been little recent commercial fishing in the Norton Bay subdistrict, but this has largely been the result of limited markets in this remote area (Brennan et al. 2000). Average commercial harvests over the last five years (1995-1999) in the Norton Sound district have been 7,300 chinook, 38,000 coho, 22,000 chum, and 244,000 pink salmon (Table 1). Commercial harvests in 2000 were 752 chinook, 44,409 coho, 6,150 chum, 166,548 pink and 14 sockeye salmon. The Port Clarence District includes all waters from Cape Douglas north to Cape Prince of Wales, including the drainages of the Pilgrim and Kuzitrin rivers (Figure 9). Commercial salmon fishing was prohibited in this district in 1967. Few stocks are present and their run sizes are relatively small, however, the sockeye run into Salmon Lake that passes through the district has increased to over 10,000 fish in recent years. Because of the existence of important subsistence fisheries on these stocks, commercial fishing has never reopened. The Kotzebue Sound District includes all waters from Cape Prince of Wales to Point Hope (Figure 10) and is the northern most commercial fishing district in Alaska. The current

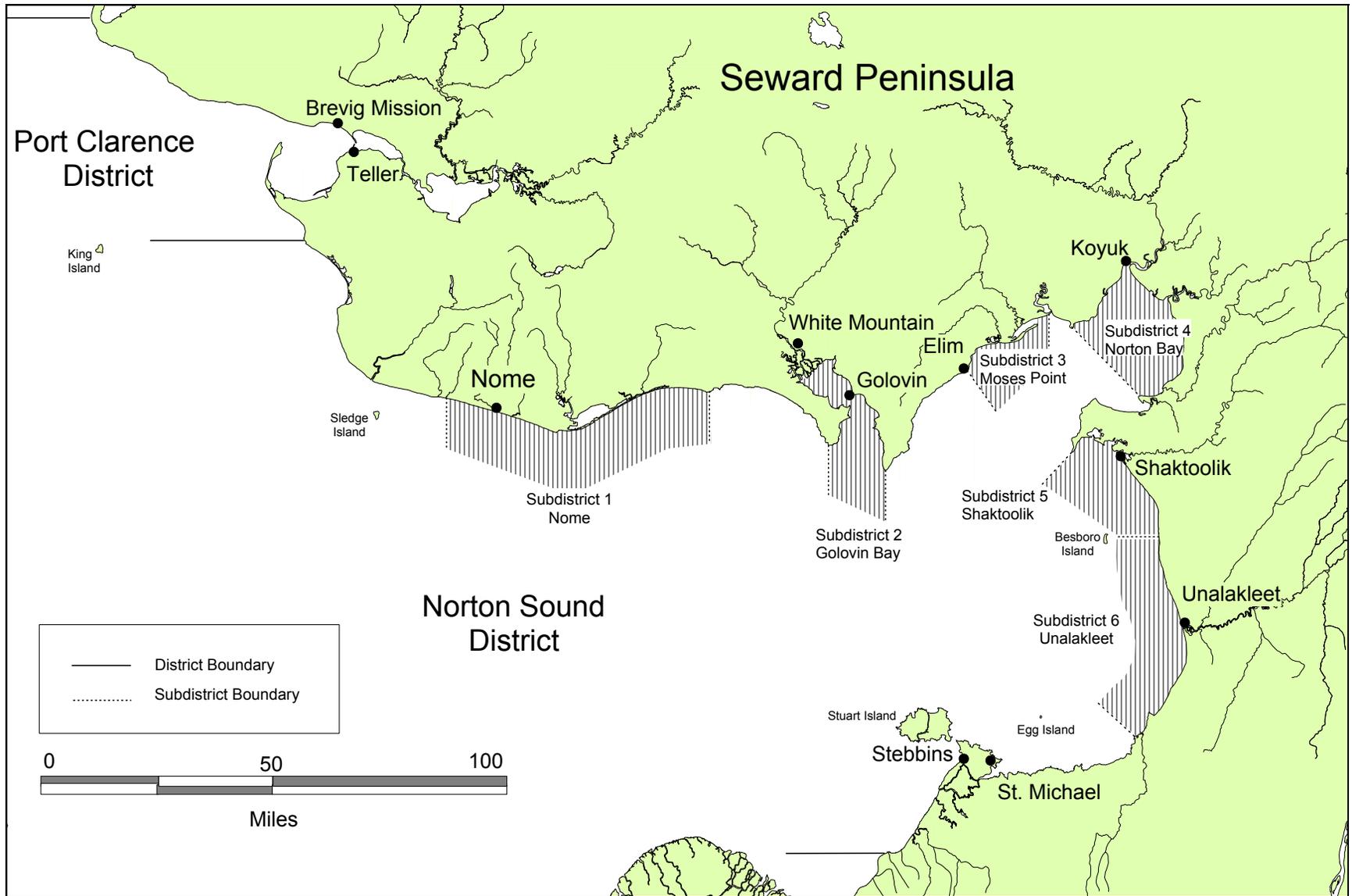


Figure 8.-Commercial salmon fishing subdistricts in Norton Sound.

Table 1.-Historic commercial salmon harvests by subdistrict from the Norton Sound district 1980-2000.

Year	Nome (Subdistrict 1)					Golovin (Subdistrict 2)					Moses Point (Subdistrict 3)				
	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum
1980	8			10,007	23,937	36	36	328	10,744	52,609	502			1,435	14,755
1981	4		508	3,202	22,380	23	5	13	49,755	58,323	198		5	26,417	29,325
1982	20		1,183	18,512	33,162	78	5	4,281	39,510	51,970	253		318	9,849	40,030
1983	23		261	308	12,283	52	10	295	17,414	48,283	254			17,027	65,776
1984	7		820		4,571	31		2,462	88,588	54,153			5,959	28,035	9,477
1985	21		356		6,596	193	113	1,196	3,019	55,781	816	32	1,803	559	24,466
1986	6		50		8,216	81	8	958	25,425	68,725	600	41	5,847	15,795	20,668
1987	3		577		6,226	166	51	2,203	1,579	44,344	907	15	64	568	17,278
1988	2		54	182	1,866	108	921	2,149	31,599	33,348	663	93	3,974	13,703	18,585
1989	2			123	617			0	0		62			0	167
1990	0	0				52	21	0	0	15,993	202	0	0	501	3,423
1991	0	0				49	1	0	0	14,839	161	0	0	0	804
1992	1	2	693	185	1,762	6	9	2,085	0	1,002	0	0	3,531	0	6
1993	0	2	611	0	745	1	4	2	8,480	2,803	3	0	4,065	0	167
1994	0	1	287	0	354	0	0	3,424	0	111	0	0	5,345	0	414
1995	0	1	369	0	492	0	0	1,616	4,296	1,987	4	44	3,742	2,962	1,171
1996	0	0	9	13	25	0	0	638	0	0	0	0	1,915	68,609	0
1997	0	0	0	0	0	19	2	102	20	8,003	844	0	1,409	0	2,683
1998	0	0	0	0	0	1	0	3	106,761	723	105	0	1,462	145,699	2,311
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	1,645	17,408	164	10	0	5,182	46,369	535
95-99 Avg	0	0	76	3	103	4	0	472	22,215	2,143	191	9	1,706	43,454	1,233
90-99 Avg	0	1	246	25	422	13	4	787	11,956	4,546	132	4	2,147	21,777	1,098

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Table 1.-Page 2 of 2.

Year	Norton Bay (Subdistrict 4)					Golovin (Subdistrict 2)					Unalakleet (Subdistrict 6)				
	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum
1980	340			47	7,855	1,086		8,001	1,947	27,453	4,339	3	21,512	203,142	64,198
1981	63			177	3,111	1,484	4	1,191	29,695	21,097	6,157	47	29,845	123,233	39,186
1982	96		2,332	2,535	7,128	1,677	3	22,233	17,019	26,240	3,768	2	61,343	142,856	44,520
1983	215		204	3,935	17,157	2,742	4	12,877	12,031	67,310	7,022	13	36,098	26,198	109,220
1984				1,162	3,442	1,613		10,730	1,596	32,309	6,804	6	47,904		43,317
1985	528		384	68	9,948	5,312	29	2,808		13,403	12,621	21	15,421	1	25,111
1986	139	2	1,512	40	1,994	1,075		6,626		16,126	4,494	153	20,580		30,239
1987	544		145	16	3,586	2,214	79	6,193		14,088	3,246	141	15,097	97	17,525
1988	434	2	709	1,749	7,521	671	43	6,096	3,671	21,521	2,218	157	24,232	23,730	25,363
1989						1,241	49	8,066		19,641	4,402	222	36,025		20,825
1990	0	0	0	0	0	2,644	55	4,695		21,748	5,998	358	52,015		23,659
1991	0	0	0	0	0	1,324	56	11,614		31,619	4,534	147	52,033		39,609
1992	27	0	0	0	1,787	1,098	20	14,660		27,867	3,409	229	84,449	6,284	52,547
1993	267	0	0	290	1,678	3,756	8	11,130	106,743	20,864	5,944	251	26,290	42,061	28,156
1994	0	0	0	0	0	885	5	22,065	502,231	5,411	4,400	71	71,019	480,158	12,288
1995	0	0	0	0	0	1,239	1	10,856	37,377	14,775	7,617	78	31,280	37,009	24,843
1996	0	0	0	0	0	1,340		13,444	304,982	3,237	3,644		52,200	113,837	7,369
1997	194	0	0	0	531	2,449		4,694	0	5,747	9,067	159	26,079		17,139
1998	0	0	0	0	0	910		3,624	236,171	7,080	6,413	7	24,534	99,412	6,210
1999	0	0	0	0	0	581	0	2,398	0	2,181	1,927	0	10,264	0	5,700
2000	0	0	0	0	0	160	3	7,779	85,493	2,751	582	11	29,803	17,278	2,700
95-99 Avg	39	0	0	0	106	1,304	1	7,003	115,706	6,604	5,734	61	28,871	62,565	12,252
90-99 Avg	49	0	0	29	400	1,623	21	9,918	169,643	14,053	5,295	144	43,016	111,252	21,752

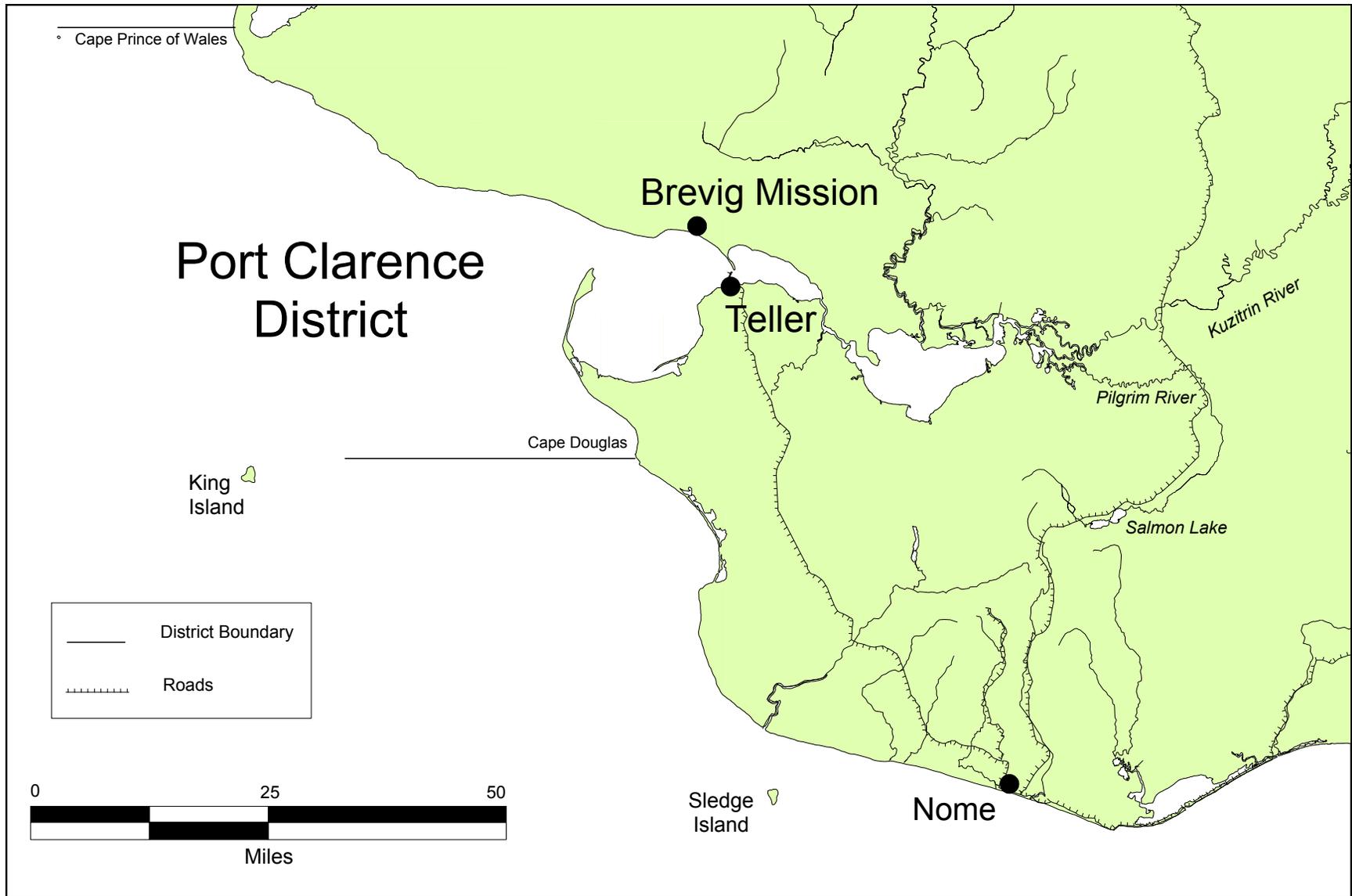


Figure 9.-The Port Clarence commercial fishing district.

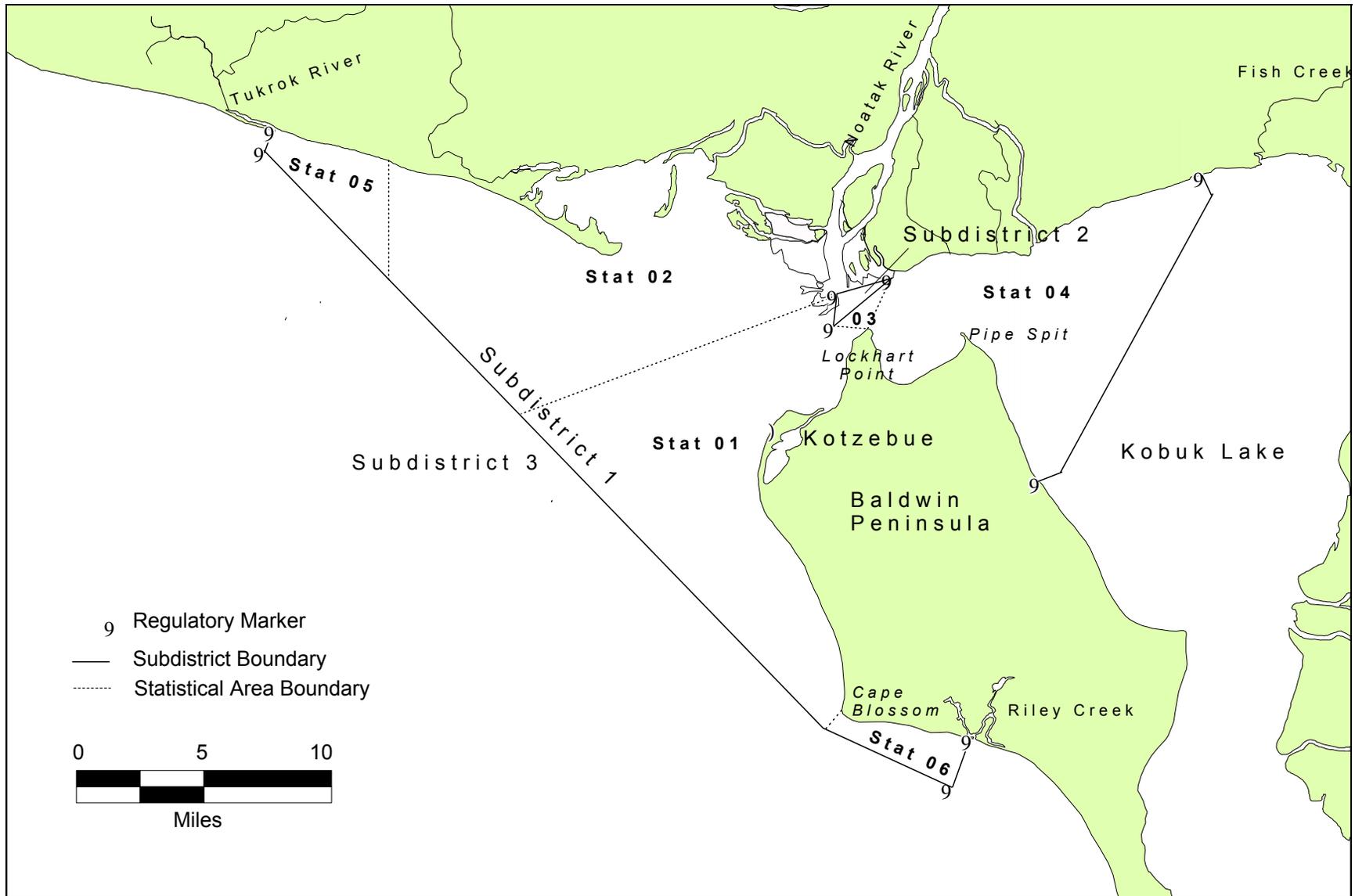


Figure 10.-The Kotzebue commercial salmon fishing district.

commercial fishery opened under state management in 1962, but there are documented sales of salmon in the Kotzebue area dating back to the early 1900s. This is primarily a chum salmon fishery with a few chinook taken annually and an incidental take of Dolly Varden that pass through the fishery in August. Average commercial harvests over the past five years (1995-1999) in the Kotzebue Sound District have been 142,000 chum salmon and about 1,500 Dolly Varden (Table 2). The harvest in 2000 was 159,802 chum salmon and 7 Dolly Varden. There is also a directed under ice commercial fishery on sheefish in Hotham Inlet. Documented annual harvests in this fishery have averaged only 250 fish over the past five years, and the harvest quota of 25,000 pounds has never been met. Brennan et al. (2002) documents these fisheries in greater detail.

The CFMD conducts annual assessments of salmon escapements using weirs, counting towers and aerial surveys (Table 3). The status of Norton Sound chum salmon stocks of concern was recently reviewed by the BOF and biological escapement goals (BEGs) for chum salmon based on aerial survey counts in Nome Subdistrict streams have been established (Table 4). In addition, Sustainable Escapement Goals (SEGs) have recently been developed for salmon stocks that lacked adequate data for the development of more formal BEGs. Optimal Escapement Goals (OEG) have also been developed for some species/river combinations. An OEG is a specific management objective for escapement that considers biological and allocative factors and may differ from the SEG or BEG. The BOF places an OEG into regulation and the department manages to maintain escapements within the bounds of the OEG. With the exception of the Kwiniuk River that is based on a tower count, the escapement goals are based on aerial survey data, but will be revised using tower or weir counts when sufficient data are available.

SUBSISTENCE FISHERIES`

There are approximately 16,000 people in the NWMA. Except for the two larger communities of Nome and Kotzebue, the population is scattered among 26 small villages along the coast and the major area rivers (Alaska Dept. of Labor 1991). Most of the population is comprised of Alaska Natives, many of whom lead a relatively traditional lifestyle. Most area residents rely heavily on the subsistence use of fish and wildlife for their livelihood. Subsistence use of salmon is monitored in village surveys conducted by the Division of Subsistence. Recent subsistence salmon harvests (1995-1999) have averaged about 98,000 fish in the Norton Sound District (Table 5); 11,000 in the Port Clarence District; and about 84,000 in the Kotzebue Sound District (Table 6). In 2000, 218,000 salmon were harvested for subsistence in the Norton Sound District, 6,500 in the Port Clarence District, and 69,000 in the Kotzebue District. In addition to salmon, saffron cod, rainbow smelt, Dolly Varden and whitefish are taken. In the Kotzebue District, sheefish are also an important subsistence resource, especially in the villages along the Kobuk River, Kotzebue, and Selawik. The relative importance of whitefish is higher in the Kotzebue Sound District than in many areas of the state. The subsistence harvest of whitefish in 1997 was estimated at 84,851 for the village of Noatak and the five Kobuk River villages combined. In 1998 and 1999 the whitefish harvests were estimated at 39,754 and 56,326 respectively, and in 2000, 70,097 were estimated to have been harvested (Brennan et al. 2000).

ALASKA BOARD OF FISHERIES ACTIVITIES

The development of regulations for recreational fisheries in the NWMA occurs within the established Alaska Board of Fisheries (BOF) process. Local fish and game advisory committees have been established throughout Alaska to assist the BOF by bringing local issues to their

Table 2.-Kotzebue district chum salmon commercial harvests and incidental Dolly Varden harvests 1980-2001.

Year	Chum Salmon	Dolly Varden	
		Sold	Caught
1980	367,284	3,049	
1981	677,239	3	
1982	417,790	3,447	
1983	175,762	190	
1984	320,206	347	1,090
1985	521,406	454	3,600
1986	261,436	5	2,373
1987	109,467	1,261	
1988	352,915	752	
1989	254,617	3,093	
1990	163,263	604	
1991	239,923	6,136	
1992	289,184	1,977	
1993	73,071	76	
1994	153,452	149	
1995	290,730	2,090	
1996	82,110	188	
1997	142,720	3,320	
1998	55,907	349	
1999	138,605	1,502	
2000	159,802	7	
2001	211,662	0	
96-00 Avg	115,829	1,073	
91-00 Avg	162,550	1,579	

Table 3.-Recent chum salmon escapements in Nome subdistrict streams, 1995-2000.

Location	1995-1999 Average Estimate or Goal	Year					
		1995 Estimate	1996 Estimate	1997 Estimate	1998 Estimate	1999 Estimate	2000 Estimate
Sinuk River							
Aerial Survey	3,600-7,200 (Goal)	3,110	1,815 (early)	2,975	630 (incomplete)	no survey	10 (incomplete)
Snake River							
Tower	2,212 (Estimate)	4,393	2,772	6,184	11,067	484	1,400 ^a
Aerial Survey	800-1,600 (Goal)	No Survey	405	No Survey	2,057	400 (incomplete)	59 (incomplete)
Nome River							
Tower/Weir	2,254 (Estimate)	5,092	3,339	5,131	976	1,048	4,051 ^a
Aerial Survey	1,600-3,200 (Goal)	1,855	799 (incomplete)	956 (incomplete)	335 (incomplete)	375 (incomplete)	658 (incomplete)
Eldorado/Flambeau Rivers							
Eldorado Tower	11,677 (Estimate)	39,867	12,655	14,302	13,808	4,218	10,604 ^a
Eldorado, Flambeau Rivers Combined Aerial Survey	5,200-10,400 (Goal)	16,220	26,100 (incomplete)	4,340 (incomplete)	no survey	1,796 (incomplete)	4,202 (incomplete)
Bonanza River							
Aerial Survey	<u>1,000-1,900</u> (Goal)	0 (incomplete)	1,980 (incomplete)	881 (incomplete)	no survey	361 (incomplete)	1,130 (incomplete)
Solomon River							
Aerial Survey	300-550 (Goal)	315	323	316 (incomplete)	90 (incomplete)	51 (incomplete)	150 (incomplete)

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Table 3.-Page 2 of 2.

Location	1995-1999 Average Estimate or Goal	Year					
		1995 Estimate	1996 Estimate	1997 Estimate	1998 Estimate	1999 Estimate	2000 Estimate
Fish River							
Niukluk Tower	35,775	86,333	80,121	57,304	45,587	35,240	<u>26,724</u> ^a
Niukluk, Boston, Fish Rivers Combined Aerial Survey Index	23,200-46,400 (Goal)	43,012	19,077 (incomplete)	40,500 (incomplete)	4,126 (incomplete)	640 (incomplete)	No Survey
Kwiniuk River							
Kwiniuk Tower	15,600-31,200 (Goal)	42,703	28,493	20,118	24,248	8,763	12,251 ^a
Tubutulik River							
Aerial Survey	13,600-27,200 (Goal)	16,518	10,790 (incomplete)	3,105	10,060	no survey	No Survey
Unalakleet River							
North Tower	2,501 (Estimate) ^b	no project	9,789 (incomplete)	6,904 (incomplete)	5,421 (incomplete)	5,600 (incomplete)	3,717 ^a
Unalakleet Test Fish	560 (Index)	1,101	1,424	743	492	956	1,083
Unalakleet, Old Woman Rivers Combined Aerial Survey Index	2,400-4,800 (Goal)	6,080	296 (incomplete)	4,840 (incomplete)	1,230 (incomplete)	no survey	no survey

^a Preliminary estimate.

^b Average estimate includes years 1996-1999.

Note: "Incomplete" survey indicates a survey was flown, but not used in the "Goal" assessment due to timing or survey conditions

Table 4.-Salmon biological escapement goals (BEGs) for Norton Sound area streams, 2000.

Location		Chum Sal.	Chinook	Sockeye	Coho	Pink
Salmon Lake				Combined		
Grand Central River				4,000-8,000		
Pilgrim River	none					
Glacial Lake				800-1,600		
Sinuk River		3,600-7,200				
Cripple River	none					
Penny River	none					
Snake River		800-1,600				
Nome River		1,600-3,200				13,000
Flambeau River		Combined				
Eldorado River		5,200-10,400				
Solomon River		300-550				
Ophir Creek					Combined	
Niukluk River		Combined			950-1900	
Fish River		Combined	Combined			
Boston Creek		23,200-46,400	100-250			
Kwiniuk		15,600-31,200	300-500		650-1,300	12,500
Tubutulik		13,600-27,200				
Inlitalik River	none					
Ungalik River	none					
Shaktookik				400-800		48,000
Unalakleet River		Combined	Combined			
Old Woman River		2,400-4,800	550-1,100			
North River			250-500		550-1,100	8,500

Table 5.-Subsistence salmon harvests by subdistrict for the Norton Sound district 1980-2000.

Year	Nome (Subdistrict 1)					Golovin (Subdistrict 2)					Moses Point (Subdistrict 3)				
	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum
1980	129		2,157	22,246	5,983	12		692	10,727	4,057	131		229	4,232	1,393
1981	35	14	1,726	5,584	8,579	8		1,520	5,158	5,543	32		2,345	6,530	2,819
1982	21	6	1,829	19,202	4,831	7		1,289	4,752	1,868	1		1,835	3,785	3,537
1983	74	53	1,911	8,086	7,091										
1984	83	16	1,795	17,182	4,883										
1985	56	114	1,054	2,117	5,667	12	2	430	1,904	9,577	67		1,389	1,212	947
1986	150	107	688	8,720	8,085										
1987	200	107	1,100	1,251	8,394										
1988	63	133	1,076	2,159	5,952										
1989	24	131	469	924	3,399										
1990	58	234	510	2,233	4,246										
1991	83	166	1,279	194	3,715						312		2,153	3,555	2,660
1992	152	163	1,481	7,351	1,684						100		1,281	6,152	1,260
1993	52	80	2,070	873	1,766						368		1,217	1,726	1,635
1994	23	69	983	6,556	1,673	253	168	733	8,410	1,337	322	104	1,180	9,345	3,576
1995	36	211	1,897	486	5,344	165	34	1,649	7,818	10,373	284	17	1,353	2,046	3,774
1996	19	353	1,317	5,802	4,333	86	134	3,014	17,399	2,867	417	52	1,720	9,442	2,319
1997	19	99	534	287	4,996	138	427	555	4,570	4,891	619	50	1,213	1,314	2,064
1998	15	14	1,057	4,797	964	184	37	1,292	13,340	1,893	414	49	1,831	6,891	1,376
1999	11	85	161	58	337	60	48	1,234	469	3,656	424	13	975	1,564	744
2000	7	26	747	2,657	535	169	18	2,335	10,906	1,155	248	46	1,429	5,983	1,173
Avg 95-99	20	152	993	2,286	3,195	127	136	1,549	8,719	4,736	432	36	1,418	4,251	2,055
Avg 90-99	47	147	1,129	2,864	2,906	148	141	1,413	8,668	4,170	362	48	1,436	4,671	2,156

-continued-

Table 5.-Page 2 of 2.

Year	Norton Bay (Subdistrict 4)					Shaktoolik (Subdistrict 5)					Unalakleet (Subdistrict 6)				
	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum	Chinook	Sockeye	Coho	Pink	Chum
1980	22		33	4,275	1,132	57		756	3,227	1,827	1,046		4,758	19,071	5,230
1981	7		82	2,314	3,515	8		525	2,225	3,490	869	24	5,808	5,750	4,235
1982	1		484	2,600	2,485	68		2,138	3,865	1,165	913	2	7,037	20,045	4,694
1983											1,868	33	6,888	13,808	4,401
1984											4,650	1	6,675	17,418	3,348
1985						298		1,379	24	298	1,397	3	2,244	55	1,968
1986															
1987															
1988															
1989													4,681	17,500	1,388
1990											2,476				
1991															
1992															
1993															
1994	308	1	370	6,049	4,581	1,175	1	2,777	9,133	1,221	5,294	819	16,081	31,572	12,732
1995	475	46	985	3,514	5,828	1,275	2,480	2,626	7,024	2,480	5,049	807	13,110	17,246	13,460
1996	295	3	676	3,929	4,161	1,114	31	3,615	8,370	4,425	5,324	608	15,963	19,782	16,481
1997	656	54	322	1,795	4,040	1,146	62	2,761	5,779	1,612	6,325	353	9,120	10,804	7,646
1998	684	0	388	2,009	6,192	982	92	1,872	6,270	1,034	3,963	201	7,303	13,173	2,551
1999	327	0	167	1,943	4,153	818	183	1,556	5,092	467	2,691	537	8,140	10,067	3,692
2000	397	2	267	2,255	4,714	440	20	2,799	5,432	2,412	2,429	212	5,878	10,631	3,000
Avg 95-99	487	21	508	2,638	4,875	1,067	570	2,486	6,507	2,004	4,670	501	10,727	14,214	8,766
Avg 90-99	458	17	485	3,207	4,826	1,085	475	2,535	6,945	1,873	4,446	554	11,620	17,107	9,427

Table 6.-Subsistence salmon harvests for the Port Clarence and Kotzebue districts 1980-2000.

Year	Port Clarence District					Kobuk River Villages	Kotzebue District Chum Salmon		
	Chinook	Sockeye	Coho	Pink	Coho		Noatak	Kotzebue	Other Villages
1980	7	3,195	5	3,170	1,715	8,494	2,135	2,387	455
1981	8	255	110	765	5,845	9,459	5,465	4,099	1,017
1982	23	405	100	4,345	684	19,648	5,479	347	419
1983	17	261		615	299	5,486	4,035	88	2,140
1984						7,231	6,049	13,494	573
1985						17,411		36,311	
1986						12,901	1,246		
1987						7,067	2,921		
1988						13,723			
1989	28	535	472	395	410	3,894	1,595		
1990						4,353	3,921		
1991						11,103	3,637		
1992						12,260	2,043		
1993						12,160	3,270		
1994	181	1,979	1,692	3,849	2,042	26,612	6,126		3,488
1995	76	4,481	1,739	3,293	6,011	38,867	6,359	50,708	6,947
1996	195	4,558	2,079	2,587	1,264	39,076	10,091	50,573	
1997	158	3,177	829	755	2,099	26,242	5,309	26,355	
1998	287	1,665	1,759	7,812	2,621	21,398	2,614	24,986	
1999	89	2,392	1,030	786	1,936	14,264	1,616	64,768	
2000	72	2,851	935	1,387	1,275	21,538	7,293	37,144	
Avg 95-99	161	3,255	1,487	3,047	2,786	27,969	5,198	43,478	6,947
Avg 90-99	164	3,042	1,521	3,180	2,662	20,634	4,499	43,478	5,218

attention, and proposing or commenting on regulation changes proposed for upcoming meetings. Active committees meet at least once a year and in the fall prior to scheduled BOF meetings in order to provide timely information regarding regulation proposals or concerns that may affect a local area. Staff from the various divisions of ADF&G are often invited to attend committee meetings, to interact with the public, and to provide information to the committee regarding issues of local concern. Within the NWMA there are eight local advisory committees to serve resource users of the area: Kotzebue, Noatak/Kivalina, Upper Kobuk, Lower Kobuk, Northern Seward Peninsula, Norton Sound, Southern Norton Sound and St. Lawrence Island advisory committees.

The current BOF schedule provides for meetings rotated through areas of the state on a 3-year schedule. The last BOF meeting that addressed the NWMA occurred in December 2000. The BOF adopted several regulations that affected sport fisheries in the NWMA during that meeting.

Two regulations dealt with salmon fisheries in the Unalakleet River drainage, and one with sheefish in the Selawik River drainage. One statewide salmon regulation affected salmon fisheries in the NWMA. The statewide chinook salmon regulation set the daily bag and possession limit for chinook salmon less than 20 inches in length (jack kings) at 10 per day. In the Unalakleet River drainage, the daily bag and possession limit for salmon, other than king salmon, was reduced from 10 per day to five per day. To address catch and release mortality of coho salmon released in the estuary, a regulation was passed that prohibited an angler from fishing downstream from the South River after a bag limit of coho had been taken. In the Selawik River drainage, the daily bag and possession limit for sheefish upstream from the Tagagawik River (spawning area) was reduced from 10 fish to two fish. This action made the regulations on the Selawik River consistent with those on the Kobuk River. In addition, subsistence fishing for Arctic grayling was closed on the Nome and Solomon rivers.

The area management biologist has EO authority (5AAC 75.003) that allows the in-season modification of time, area, and bag/possession limit regulations as necessary to address conservation concerns on a species, area or fishery basis. EOs issued in the NWMA during the reporting period are summarized in Appendix C, and mentioned in the following sections of this document addressing specific fisheries.

ESTABLISHED MANAGEMENT PLANS AND POLICIES

There are presently no specific BOF adopted management plans that pertain to the NWMA sport fisheries. However, the Division of Sport Fisheries has developed objectives for the region or its constituent areas and has identified them in fishery based management plans. Management plans currently under development and review deal with Nome area roadside Arctic grayling fisheries, and Kotzebue Sound/Chukchi Sea Dolly Varden fisheries. In addition, a series of general divisional criteria that have been prepared to guide the establishment of fishery objectives which are listed below:

1. **Protection and management of existing fish resources.** Divisional activities should strive to manage and protect Alaska's wild stocks of fish resources for future generations.
2. **Public use and benefits of existing fish resources.** Alaska's fishery resources should be made available for public use and benefit on a sustained yield basis.

3. **Rehabilitation of depressed stocks and damaged habitat.** Division activities should strive to restore and maintain fish stocks and habitat damaged by man's activities.
4. **Enhancement of natural production or creation of new opportunities.** The Division should pursue creation of new sport fishing opportunities through rehabilitation of natural stocks or creation of new fisheries where these opportunities do not negatively affect other fisheries.

Management plans prepared for specific NWMA fisheries also identify a series of fishery objectives. While in some cases the objectives are different, objectives that recur frequently in the plans include:

1. Management of sport fisheries so that harvests do not jeopardize sustained yield of the harvested stocks;
2. Management of fisheries to maintain historic stock abundance and size composition;
3. Maintenance, and/or improvement of public access to fishing opportunities; and,
4. Promote awareness of sport fishing opportunities that exist.

Existing management plans are under review, and a region wide Arctic grayling management plan is being developed.

MAJOR ISSUES FOR THE NORTHWESTERN MANAGEMENT AREA

1. Nome subdistrict salmon. Chum salmon stocks in the Nome subdistrict have been depressed since the mid 1980s. Fisheries divisions of the department have been cooperating in the recovery of these stocks. Efforts, including egg incubation boxes, fishery closures and increased escapement monitoring are ongoing. The Bureau of Land Management is operating a weir to count sockeye as they migrate into Glacial Lake. In addition, a lake fertilization project on Salmon Lake to increase zooplankton production for rearing sockeye has also been undertaken. Sport Fish Division has participated in these efforts through the Regional Planning Team (RPT), and through cooperation with other divisions. Chum salmon sport fisheries remain closed.
2. Wulik River Dolly Varden. Development of a world-class zinc deposit at the Red Dog site in the upper Wulik River drainage carries the risk of heavy metal contamination on one of the most important streams in Northwest Alaska for Dolly Varden. There has been concern that heavy metal contamination of Red Dog and Ikalukrok creeks would occur both from natural leaching of the ore body as it was stripped for ore production and from discharge of contaminated waters into the river. A contamination problem in 1989 and 1990 has been controlled with additional waste-water treatment and the construction of a clean water bypass system in Red Dog Creek. Water quality is monitored by the Division of Habitat and mine personnel. Contamination along the road corridor has recently been documented by the NPS. The Division of Sport Fish counts Dolly Varden overwintering in the Wulik River annually and collects fish from which tissues are excised for heavy metal analyses.
3. Nome area gold mining. The future development of large scale lode deposits of gold near Nome has the potential to degrade fish habitat in the Snake, Cripple and Solomon River drainages. Interest in mining is directly related to the world price of gold. In the last two years, development interest has declined with the price of gold.

4. Rural resentment of sport fishing and sport anglers. Rural Alaskans often feel resentment toward “outsiders” who come into remote areas traditionally used by local people for subsistence hunting or fishing. They sometimes have a cultural bias against the concept of "sport fishing" and feel that people do not have the right to "play" with food resources. The bias can be particularly strong towards catch-and-release practices and has led to resentment of sport anglers who wish to fish in remote waters of NWMA, and to proposals before the BOF that would eliminate catch and release in some fisheries.
5. Effects of federal subsistence fisheries management on sport fishing opportunity in the NWMA. During October 1999, the federal government through the US Fish and Wildlife Service (USFWS) Office of Subsistence Management took over management of subsistence fisheries on waters within or adjacent to Federal Conservation units. There is concern that a result of this action will be reduced opportunity for sport fishing throughout much of Alaska. Since there is a large amount of Federal Public land within the NWMA that is used by local residents for subsistence purposes, the potential loss of opportunity in remote areas of the NWMA is of acute concern to anglers and sport fish managers. The ADF&G continues to work with federal managers and Rural Advisory Councils to address fisheries issues as they arise.

ACCESS PROGRAM

The Sport Fish Access Program was initiated nation-wide in 1984 as a result of the Wallop-Breaux Amendment to the Sport Fish Restoration (Dingell-Johnson or D-J) Act. The Sport Fish Access program is comprised of two parts. The first involves major capital improvement projects, such as boat launches, parking areas, camping areas handicap-accessible public fishing docks, access roads and trails, and the purchase or lease of lands or right-of-ways to ensure public access to fishing sites. The second portion of the program is called the Small Access Site Maintenance Project. This annually funded program involves maintaining and upgrading existing angler access sites. Activities include placing and maintaining signs at lake and river access sites, constructing and maintaining trails, and securing public rights-of way to fishing sites. Portable toilets, picnic tables and trash removal are provided at heavily used roadside sites. At remote sites, this project provides tent platforms and outhouses; it also publishes brochures on fishing and boating opportunities.

To date, few access projects have been proposed for the rural areas of the NWMA, however, a boat launching facility was recently built in the village of Unalakleet using Access funding.

SECTION II: SEASON SUMMARY FOR 2001

COMMERCIAL AND SUBSISTENCE FISHERIES

The 2001 commercial salmon fishery in Norton Sound was one of the poorest on record for all species. The chinook harvest of 213 fish was the lowest on record, and the coho harvest of 19,492 was almost 50% below the recent 5-year average. The commercial chum harvest was only 7,881 fish and was 26% below the recent 5-year average for that species. No commercial harvest of pink salmon occurred in 2001. Subsistence fisheries in eastern Norton Sound were allowed to proceed normally. In 1999 the BOF designated the Nome Subdistrict as a Tier II chum salmon management area. Permits were initially issued to 20 qualified fishers for the 2000

season, and another 10 permits were issued in mid-July. The season in the Nome Subdistrict began with a total subsistence salmon closure. Openings were announced on a stream by stream basis as data on escapement became available.

PINK SALMON

Because of the subsistence salmon closure, sport fisheries for all salmon in the Nome Subdistrict were also closed by EO No. 3-SS-01-01 (Appendix C). Escapement of pink salmon in the Nome subdistrict during 2001 was extremely weak, and sport fishing remained closed for this species until July 31 by which time most of the run had entered area rivers. Tower or weir count totals for drainages upstream from these facilities were: 1,295 in the Snake River, eight in the Eldorado River, and 3,138 in the Nome River. Farther east in Norton Sound, the runs were stronger; 41,625 pink salmon were counted past the Niukluk Tower, and the Unalakleet River had a relatively strong run with 24,737 counted past the tower on the North River. Sport fishing in these areas remained open with no in season adjustments to the fisheries.

CHUM SALMON

Chum salmon runs remained depressed throughout the Nome subdistrict in 2001. Sport fisheries remained closed by regulation, no commercial fishing occurred, and subsistence fisheries were regulated under Tier II management. Even with these restrictions in place, escapements of chum salmon in Nome subdistrict streams in 2001 remained low, but in general were somewhat stronger than in recent years. In the Nome River, 2,859 chum salmon were counted past the weir, and 2,182 were counted past the Snake River tower. The Eldorado River fared somewhat better with 11,635 chum salmon counted past the tower, slightly exceeding the escapement goal range of 5,200 – 10,400 chum salmon for that drainage. Escapement of chum salmon in the Niukluk River counted past the tower was 30,662 chum salmon, which was within the escapement goal range of 23,200 – 46,400 for the river. The North River tower (Unalakleet River) obtained a count of 6,515 chum salmon in 2001. The Kwiniuk River with 16,598 chum salmon counted past the tower just reached its Optimal Escapement Goal of 11,500 – 23,000 in 2001. Only 11,100 chum salmon were harvested commercially in Norton Sound in 2001, 7,094 in the Golovin Bay subdistrict, 681 in the Moses Point subdistrict, 1,813 in the Shaktoolik subdistrict, and 1,512 in the Unalakleet subdistrict. Sport fisheries outside the Nome subdistrict remained open without management action in 2001.

CHINOOK SALMON

The chinook salmon fishery in Norton Sound is functionally confined to the Unalakleet River with little effort or harvest elsewhere. During 2001, 1,337 chinook were counted past the tower on the North River, and in general, chinook escapement was thought to be below average. However, there were some staffing problems with the tower in 2001, and it was not operational until well into the chinook run in the Unalakleet River, therefore, this count is considered a minimum escapement for 2001. The average count past the tower for all years (1972-1974, 1984-1986, and 1996-1999) has been 2,622 chinook. Data collected during 1997 and 1998 in a radio tagging study indicated that about 40% of the Unalakleet River chinook run migrated past the counting tower on the North River. Therefore 3,343 is a minimum estimate of chinook escapement in the Unalakleet River during 2001. The commercial harvest of chinook in the Unalakleet subdistrict was only 116 fish in 2001. The sport fishery proceeded without management actions, and catches were reported to have been good.

COHO SALMON

Coho returns to Nome subdistrict streams were reasonably good in 2000. In the Nome River, 2,418 were counted past the weir, while 1,335 were estimated to have passed the tower on the Snake River. In the Solomon, Sinuk and Bonanza rivers, 297, 750 and 1,269 coho were observed respectively in aerial surveys. The count past the tower on the Eldorado River was 1,509 coho. To the east, only 3,468 coho were counted past the tower on the Niukluk River, and 9,532 were estimated past the tower on the Kwiniuk River. This was the first year that the tower on the Kwiniuk was operated through the coho run. In contrast to most years, the Niukluk River, relatively, had the weakest coho run of all northern Norton Sound streams monitored. Three EOs were issued regarding sport fishing for coho salmon in Norton Sound in 2001. One EO (No. 3-SS-01-01) issued on August 20 reduced the daily bag and possession limit for coho salmon from three to one in Nome subdistrict streams and in the Pilgrim River. This EO remained in effect for the remainder of the season. Because the coho return was lagging in the Nome River, coho fishing was closed on August 24 (EO No. 3-SS-02-01). Soon after this action, a surge of fish entered the Nome River, and fishing was reopened (EO No. 3-SS-03-01) on August 27 with a daily bag and possession limit of one coho salmon. No management actions were taken in other drainages. However, a regulation was enacted by the BOF in December 2000 that reduced the “other salmon” daily bag limit in the Unalakleet River from 10 to 5. Two thousand one was the first year that this regulation was in effect. A research project was conducted on the Unalakleet River to assess whether catch and release mortality of coho varied as fish moved from brackish water to upriver areas. Results of this study were not available at the time that this report was written.

ARCTIC GRAYLING

Arctic grayling fisheries in the Northwest Management Area in 2001 progressed without the need for in-season management actions. A stock assessment project was conducted to estimate abundance and size composition of Arctic grayling in the Snake River during 2001. Results of this project will be compared to past data to determine if management objectives are being met under the current sport fishing regulatory framework. In December 2000, the BOF closed the Nome and Solomon rivers to subsistence fishing for Arctic grayling. Kotzebue Sound/Chukchi Sea sub-area Arctic grayling fisheries are geographically dispersed over a wide area. Harvests are typically low, and although grayling abundance has not been estimated in this region, the dispersed nature of harvests suggests that no single stock is being overly exploited. No regulatory proposals addressing Arctic grayling sport fisheries are being brought before the Board of Fisheries in the December 2000 meeting.

SHEEFISH

Sheefish fisheries in northwestern Alaska proceeded without the need for in-season management actions in 2001. Spawner abundance was estimated in the Kobuk River during 1996-1998 and ranged from about 32,000 to 43,000. The sport fish sheefish harvest has averaged only a few hundred fish annually and is considered insignificant to the population. However, there are social problems associated with this fishery. Upper Kobuk River residents have commented about increasing use of the upper Kobuk River by sport fishers and other visitors. In addition, catch-and-release fishing is considered disrespectful by local residents. Two regulation changes regarding sport fishing for sheefish in northwestern Alaska were brought before the BOF in the December 2000 meeting. One would have eliminated catch-and-release fishing on sheefish

spawning areas and was not passed into regulation. The other (passed into regulation) reduced the daily bag limit for sheefish in spawning areas of the Selawik River from 10 per day to two per day aligning regulations with those in place on the neighboring Kobuk River. A project, funded by the USFWS Office of Subsistence Management, documented the sheefish harvest in the under ice sheefish subsistence fishery near Kotzebue at 14,533 fish during the winter of 2000/2001.

DOLLY VARDEN

Dolly Varden are harvested in fisheries throughout the Northwestern Management Area in both the Kotzebue/Chukchi Sea sub-area and the Seward Peninsula/Norton Sound sub-area. Dolly Varden populations in the Kotzebue/Chukchi Sea sub-area are monitored with aerial counts of spawners in selected spawning streams, and counts of overwintering aggregations in the Wulik River. Inclement weather precluded spawning counts from being conducted in 2001. On October 6, 2001 about 92,000 Dolly Varden were counted in the Wulik River. Residents of Kivalina were contacted in October and genetic and length samples were collected from subsistence harvests. Increased use of the Wulik River was reported during 2000 and 2001 in spite of poor weather most of the summer. There are no stock concerns regarding Dolly Varden in the sub-area and no stock assessment projects are ongoing. No regulatory proposals were brought before the BOF regarding Dolly Varden in the NWMA, and no in-season management actions were taken regarding Dolly Varden in the NWMA during 2001. A project to describe genetic relationships among Dolly Varden stocks north and south of the Bering Strait was begun in 2000 and continued in 2001. Another project to assess the spawning stock in Kagvik Creek was begun in 2001. These projects were funded by the USFWS Office of Subsistence Management.

SECTION III: SPORT FISHING EFFORT IN THE NORTHWESTERN MANAGEMENT AREA

SPORT ANGLING EFFORT

Recreational angler effort has been estimated for the Northwest Management Area with a mail survey since 1977 (Mills 1979-1994, Howe et al. 1995, 1996, 2000a-d, Walker et al. *In prep*). The results of this survey indicate that effort in the Northwest Management Area has remained more or less stable since 1982, with a slight decline in recent years. Effort over this period has ranged from 20,000 to 30,000 angler days during most years (Table 7; Figure 11). During 2000, the total sport fishing effort for the Northwest Management Area was estimated at 25,688 angler days. The fraction of the entire AYK Region (excluding the Upper Copper/ Upper Susitna Area) effort expended in the Northwest Management Area has declined from over 15% in 1992 to approximately 10% between 1995 and 1999. In 2000, effort increased to about 14% (Table 7). Lower effort in the NWMA during 1997 through 1999 accounts for the decline. Effort in NWMA increased by 8.5% in 2000. When the Upper Copper/Upper Susitna Area is included in the AYK total, the fraction of effort from the NWMA is about 6%.

The Seward Peninsula and Norton Sound sub-area accounts for most of the sport fishing in the NWMA. Effort in the sub-area has averaged around 18,500 angler days over the past 10 years showing a decline to 13,934 angler days from 1996-1998. The effort increased to about 15,000 angler days in 1999. This trend continued in 2000 with 18,559 angler days of effort. Rivers supporting the most sport fishing effort in the NWMA have been the Nome, Unalakleet and

Table 7.-Sport fishing effort in the A-Y-K region by management sub-areas, 1982-2000.

Year	Arctic-Yukon-Kuskokwim Region ^a												
	Tanana Area		AYK Area						Northwest Alaska				AYK Angler-Days
	Tanana Angler-Days	% AYK	North Slope Angler-Days	% AYK	Yukon Angler-Days	% AYK	Kuskokwim Angler-Days	% AYK	Seward Pen Angler-Days	% AYK	Kotzebue Angler-Days	% AYK	
1982	150,530	75.7	4,879	2.5	11,034	5.6	12,244	6.2	13,198	6.6	6,906	3.5	198,791
1983	144,981	72.8	5,738	2.9	11,070	5.6	12,429	6.2	16,944	8.5	7,963	4.0	199,125
1984	145,142	72.9	8,344	4.2	6,358	3.2	13,970	7.0	17,436	8.8	7,791	3.9	199,041
1985	135,745	72.6	4,490	2.4	8,670	4.6	11,358	6.1	19,919	10.7	6,701	3.6	186,883
1986	144,814	74.4	4,779	2.5	9,381	4.8	11,319	5.8	18,107	9.3	6,313	3.2	194,713
1987	155,346	71.6	5,256	2.4	7,017	3.2	17,856	8.2	21,413	9.9	10,221	4.7	217,109
1988	173,706	74.4	2,541	1.1	8,261	3.5	23,494	10.1	20,278	8.7	5,279	2.3	233,559
1989	185,715	77.5	4,118	1.7	10,712	4.5	16,457	6.9	17,692	7.4	4,932	2.1	239,626
1990	184,887	75.3	3,764	1.5	15,539	6.3	15,858	6.5	21,799	8.9	3,782	1.5	245,629
1991	155,662	70.8	7,291	3.3	10,749	4.9	13,055	5.9	23,622	10.7	9,543	4.3	219,922
1992	120,848	66.5	4,940	2.7	12,831	7.1	14,404	7.9	22,684	12.5	6,145	3.4	181,852
1993	160,117	72.5	5,600	2.5	14,011	6.3	14,505	6.6	18,930	8.6	7,809	3.5	220,972
1994	148,633	70.8	5,407	2.6	12,872	6.1	18,117	8.6	18,922	9.0	6,036	2.9	209,987
1995	201,389	74.5	5,644	2.1	18,677	6.9	16,289	6.0	19,647	7.3	8,495	3.1	270,141
1996	150,227	54.7	4,487	1.6	10,678	3.9	16,420	6.0	13,783	5.0	5,571	2.0	274,566
1997	119,699	65.6	5,278	2.9	12,725	7.0	27,318	15.0	13,850	7.6	3,729	2.0	182,599
1998	112,025	65.5	3,653	2.1	10,127	5.9	27,913	16.3	13,616	8.0	3,801	2.2	171,135
1999	160,427	70.7	5,230	2.3	12,906	5.7	26,563	11.7	15,006	6.6	6,771	3.0	226,903
2000	121,785	66.3	4,739	2.6	11,327	6.2	20,030	10.9	18,559	10.1	7,129	3.9	183,569
90-99 Avg.	151,391	69	5,129	2	13,112	6	19,044	9	18,186	8	6,168	3	220,371
95-99 Avg.	148,753	66	4,858	2	13,023	6	22,901	11	15,180	7	5,673	2	225,069

a AYK total does not include Copper River drainage.

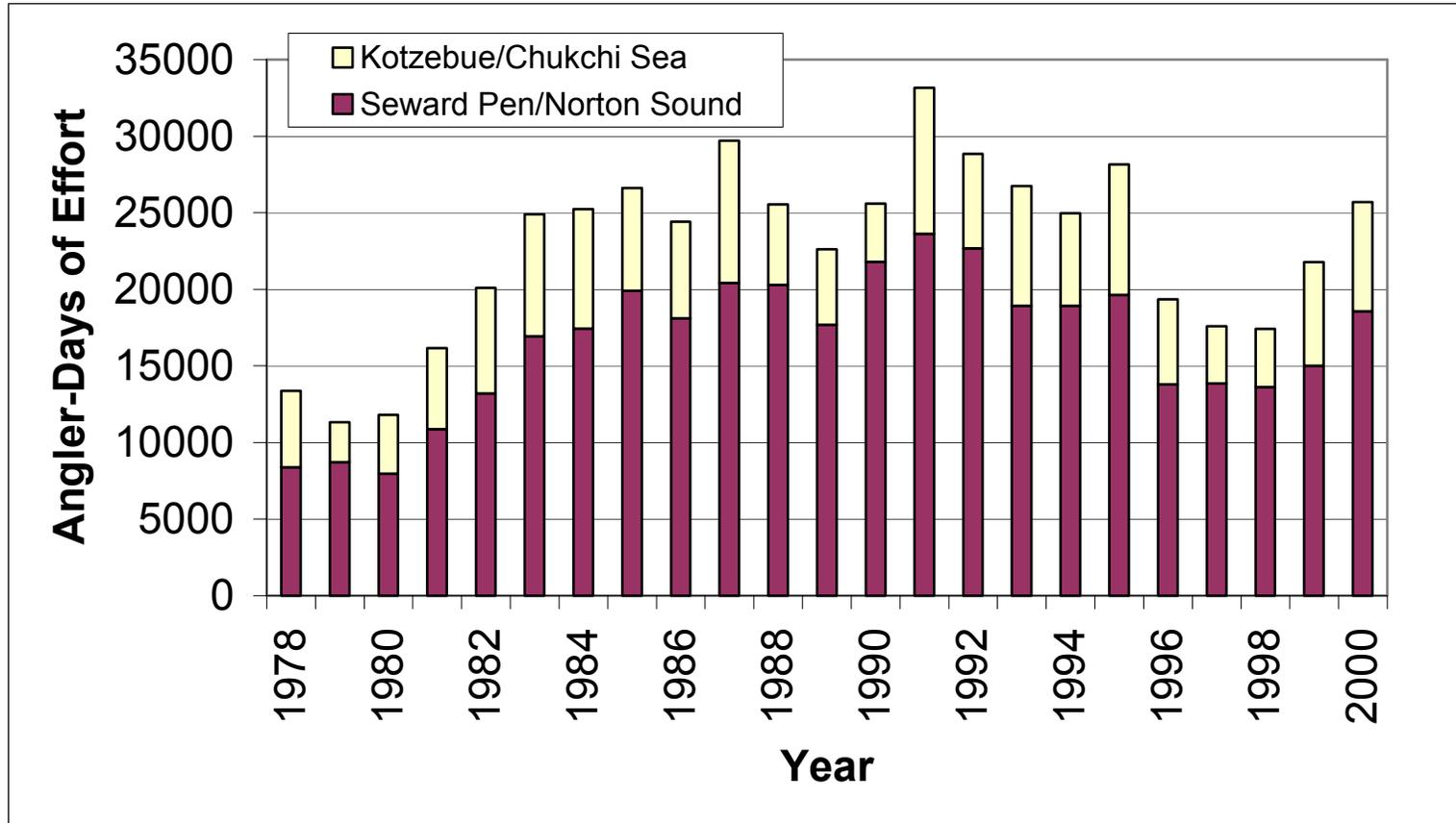


Figure 11.-Sport fishing effort in angler-days in the NWMA by sub-area, 1978-2000.

Fish/Niukluk rivers. The Nome River has sustained more fishing effort than any other stream in the NWMA for four of the past 10 years. In 1995, the Unalakleet River surpassed the Nome River as the most popular single stream in the management area with 3,832 estimated angler days. This pattern continued in 2000. Angler effort was estimated at 6,257 angler days for the Unalakleet River, approximately 1/3 of the total effort in the sub-area (Table 8). The Nome River has been closed to fishing for Arctic grayling and chum salmon, and it is likely that these closures have contributed to a reduction of fishing effort on this stream. Annual effort in the Nome River has remained around 1,450 angler days for the past three years. The Cripple River with an estimated 2,303 angler-days was the second most heavily utilized stream in 1998. This is a substantial increase over previous estimates for this stream, 206 and 166 angler days in 1996 and 1997 respectively. Effort in the Cripple River was estimated at only 66 angler days in 1999 and 600 angler days in 2000. Almost all of the sport fishing effort on the Cripple River is generated from a commercially run recreational mining camp that is located at the river's mouth.

In the Kotzebue/Chukchi Sea sub-area, sport fishing effort has been more variable, ranging from 3,700 to 10,200 angler days per year over the past 10 years. After showing a decline to about 3,800 angler days in 1997 and 1998 effort nearly doubled to 6,771 angler days in 1999. In 2000, effort dropped to an estimated 5,225 angler days (Table 8). The large drainages of the Kobuk and Noatak rivers support about half of the freshwater effort in this sub-area during most years while the remainder is dispersed among smaller drainages such as the Wulik, Kivalina and Selawik rivers, and many of the area's lakes. Expense of travel, difficulty of access and small human population likely account for the low levels of sport fishing effort reported in this region.

SECTION IV: MAJOR NORTHWESTERN AREA FISHERIES OVERVIEW

NWMA waters offer some of the most remote and diverse angling opportunities available in Alaska. Opportunities to fish for Dolly Varden, sheefish and Arctic grayling in pristine areas without encountering other anglers are widespread. Angling opportunities for salmon, especially chinook and coho are not as well known, but can be excellent seasonally in several Norton Sound streams that produce good runs. Marine sport fisheries are practically non-existent. Guided fishing comprises a small amount of the effort in northwestern Alaska. An unpublished survey conducted by the Division of Sport Fish for the 1994 season estimated that only about 1% of the total sport fishing effort in the Seward Peninsula-Norton Sound sub-area was by guided anglers while about 5% of the effort in the Kotzebue-Chukchi Sea sub-area was guided. Through the ice jigging for saffron cod, smelt, flounder, sheefish, and other species are common near settlements, but these fisheries generally operate under subsistence fishing regulations. The following sections discuss the major sport fisheries in the NWMA by species and area. Discussion of each fishery will deal with 1) historical perspective, 2) recent fishery performance 3) fishery objectives, 4) fishery outlook, 5) in-season management and recent BOF actions, 6) current issues and 7) recommended management and research programs. Recent fishery performance will focus on data from 2000. Observations regarding the 2001 season may be included for some fisheries, but data on harvest are not yet available. Summaries of historic sport fish harvests and catches are provided by fishery.

Table 8.-Sport fishing effort in angler-days for major rivers by sub-area in the Northwest Management Area, 1983-2000.

Year	Seward Peninsula/Norton Sound Sub-Area							Kotzebue/Chukchi Sea Sub-Area					MWMA
	Nome	Fish/Niukluk	Unalakleet	Snake	Pilgrim	Others	Total	Noatak	Kobuk	Wulik	Other	Total	Total
1983	3,908	1,999	4,146	119	597	6,175	16,944	1,372	3,609	805	2,177	7,963	24,907
1984	5,714	1,115	2,421	418	732	7,036	17,436	1,805	2,834	677	2,475	7,791	25,227
1985	6,514	889	5,750	361	375	6,030	19,919	3,470	2,297	550	384	6,701	26,620
1986	6,023	1,888	6,457	850	868	2,021	18,107	2,141	2,646	168	1,358	6,313	24,420
1987	1,865	2,473	942		1,159	14,974	21,413	3,584	5,133	303	1,201	10,221	31,634
1988	6,058	2,245	1,219	2,128	4,822	3,806	20,278	2,492	2,100	455	232	5,279	25,557
1989	6,569	2,124	1,701	436	1,678	5,184	17,692	2,552	1,729	107	544	4,932	22,624
1990	7,194	2,059	3,957	775	1,710	6,104	21,799	1,423	1,306	285	768	3,782	25,581
1991	4,646	2,524	5,616	2,384	3,183	5,269	23,622	4,235	2,353	93	2,862	9,543	33,165
1992	6,455	2,742	2,433	2,379	1,184	7,491	22,684	2,611	2,095	469	970	6,145	28,829
1993	3,633	3,962	2,153	1,468	1,195	6,519	18,930	3,013	2,604	350	1,842	7,809	26,739
1994	5,116	3,082	2,349	880	844	6,651	18,922	2,747	1,153	762	1,374	6,036	24,958
1995	3,044	2,603	3,832	1,968	1,253	6,947	19,647	2,504	3,681	647	1,663	8,495	28,142
1996	2,920	2,120	2,539	1,269	840	4,095	13,783	2,039	1,358	274	1,900	5,571	19,354
1997	1,914	3,017	4,393	445	820	3,261	13,850	1,159	825	553	1,192	3,729	17,579
1998	1,371	1,344	3,795	376	546	6,184	13,616	765	2,053	202	781	3,801	17,417
1999	1,463	4,916	4,176	977	433	3,041	15,006	3,142	2,099	737	793	6,771	21,777
2000	1,455	3,451	6,257	377	753	3,385	15,678	1,713	2,298	336	878	5,225	20,903
90-99 Avg.	3,776	2,837	3,524	1,292	1,201	5,556	18,186	2,364	1,953	437	1,415	6,168	24,354
95-99 Avg.	2,142	2,800	3,747	1,007	778	4,706	15,180	1,922	2,003	483	1,266	5,673	20,854

NORTHWESTERN ALASKA SALMON FISHERIES

Some guided and unguided sport fishing for salmon takes place throughout the management area, however the vast majority of salmon fishing occurs in the Seward Peninsula/Norton Sound sub-area with concentrations near Unalakleet, and in waters accessible from the Nome area road system. Some salmon fishing effort occurs in association with wilderness float trips in Kotzebue Sound drainages, but the amount of sport fishing effort expended toward salmon in the northern part of the management area is very light, consequently, harvests are very small.

Total fishing effort estimated for all species of fish in the NWMA has ranged from about 11,000 angler-days in the late 1970s to 33,000 angler-days in 1991 (Table 8). Effort has declined in recent years, and was estimated at 21,000 angler days in 2000. Salmon harvest is estimated to have ranged from 3,800 fish in 1977 to 20,000 fish in 1982 (Table 9). Mean annual harvest of salmon of all species from 1990 to 1999 was about 11,000 fish, with 97% of the harvest reported from Seward Peninsula and Norton Sound, and only about 3.0% from Kotzebue drainages. In 2000, approximately 6% of the harvest was from Kotzebue drainages. Over the past five years (1995-1999), about 49% of the total average harvest has been coho salmon, 36% pink salmon, 8% chum salmon, and 7% chinook salmon. During years of high pink salmon abundance such as 1992, 1994, 1996, and 1998, harvests of this species have comprised about 50% of the total annual salmon harvest. However, during years of low pink salmon abundance such as 1993, 1995, 1997 and 1999 coho salmon have accounted for about 60% of the total salmon harvest (Table 9).

Regulatory History

Prior to 1966, the daily bag limit was 15 fish (of all species) in freshwaters of western Alaska. From 1966 through 1970 an exception was made in the Unalakleet River where the daily bag limit was 6 salmon (all species). In 1970, the 6 salmon limit on the Unalakleet River was dropped, and a 15 salmon limit was adopted for the entire AYK Region with exceptions outside the NWMA. Salmon Lake and its tributaries were closed to salmon fishing in 1980. The general 15 salmon daily bag limit in the NWMA remained in effect until 1985 when the king salmon limit was set at 5 per day and the “other salmon” limit was set at 10 per day. An exception was made for the Snake and Nome rivers where the “other salmon” limit was 15 per day of which only 5 could be chum or coho. In 1987 emergency regulations were adopted that set the king salmon daily bag limit at 1 fish and the “other salmon” limit at 10 per day. In 1988, the king salmon daily bag limit for the AYK Region outside the Tanana River drainage was set at 3 per day with only 2 over 28 inches and the “other salmon” limit was retained at 10 per day, however, in Seward Peninsula waters, the king salmon limit was 1 per day with 10 “other salmon” of which only 3 could be chum or coho. Also in 1988, chum salmon fishing was closed by EO on the Nome River. This closure was extended to all rivers from the Sinuk to the Solomon in 1991. In 1992, this closure was adopted into regulation by the BOF. These regulations remained in effect until 1997 when the BOF broke out the “other salmon” bag limits for Northern Norton Sound and adopted daily bag limits of 10 pink, 3 coho, 3 sockeye, and 3 chum salmon. The chum salmon closure in the Nome subdistrict remains in effect. In 2000, the “other salmon” daily bag and possession limit was reduced from 10 salmon to 5 salmon in the Unalakleet River. In addition, a regulation to address the possible high catch and release mortality of coho in the estuary of the Unalakleet River was adopted. This regulation closed the area downstream from the South River for the remainder of that day, to all sport fishing for those anglers that had harvested a bag limit of coho salmon.

Table 9.-Northwest Management Area historic salmon harvests by sub-area, 1977-2000.

Year	Norton Sound/ Seward Peninsula		NW Management Area		Norton Sound/ Seward Peninsula		NW Management Area		Norton Sound/ Seward Peninsula		NW Management Area	
	Effort	Effort	Effort	Effort	KS	KS	KS	KS	Coho	Coho	Coho	Coho
1977	7,828	3,487	11,315	197	16	213	449	0	449	670	28	698
1978	8,379	4,997	13,376	303	0	303	742	0	742	546	254	800
1979	8,725	2,593	11,318		10			0			27	
1980	7,958	3,841	11,799	52	9	61	1,455	0	1,455	1,601	86	1,687
1981	10,879	5,284	16,163	70	22	92	1,504	0	1,504	1,889	32	1,921
1982	13,198	6,906	20,104	409	0	409	2,986	0	2,986	2,620	346	2,966
1983	16,944	7,963	24,907	687	0	687	3,823	0	3,823	2,042	463	2,505
1984	17,436	7,791	25,227	247	13	260	7,582	0	7,582	1,481	312	1,793
1985	19,919	6,701	26,620	239	0	239	1,177	51	1,228	1,036	310	1,346
1986	18,107	6,313	24,420	1,077	0	1,077	3,926	0	3,926	1,719	749	2,468
1987	20,413	9,288	29,701	615	95	710	2,319	11	2,330	814	402	1,216
1988	20,278	5,279	25,557	400	18	418	5,038	0	5,038	1,583	236	1,819
1989	17,692	4,932	22,624	203	0	203	4,158	0	4,158	1,497	41	1,538
1990	21,799	3,782	25,581	364	0	364	3,305	0	3,305	925	0	925
1991	23,622	9,543	33,165	404	0	404	5,800	0	5,800	1,415	59	1,474
1992	22,684	6,145	28,829	204	8	212	4,671	0	4,671	523	220	743
1993	18,930	7,809	26,739	595	0	595	3,783	9	3,792	691	443	1,134
1994	18,922	6,036	24,958	600	0	600	5,547	0	5,547	536	248	784
1995	19,647	8,495	28,142	438	0	438	3,705	0	3,705	394	321	715
1996	13,783	5,571	19,354	662	0	662	7,289	40	7,329	662	576	1,238
1997	13,850	3,729	17,579	1,106	0	1,106	4,393	0	4,393	278	272	550
1998	13,616	3,801	17,417	590	0	590	4,441	0	4,441	682	177	859
1999	15,006	6,771	21,777	630	20	650	5,582	0	5,582	211	392	603
2000	18,559	7,129	25,688	889	6	895	7,441	10	7,451	1,097	719	1,816
Avg (90-99)	18,186	6,168	24,354	559	3	562	4,852	5	4,857	632	271	903
Avg (95-99)	15,180	5,673	20,854	685	4	689	5,082	8	5,090	445	348	793

Table 9.-Page 2 of 2.

Year	Norton Sound/ Seward Peninsula			Norton Sound/ Seward Peninsula			Norton Sound/ Seward Peninsula		
	Peninsula	Kotzebue	NW Management Area	Peninsula	Kotzebue	NW Management Area	Peninsula	Kotzebue	NW Management Area
	Pink	Pink	Pink	Sockeye	Sockeye	Sockeye	Total	Total	Total
1977	2,402	8	2,410	0	0	0	3,718	52	3,770
1978	7,399	0	7,399	0	0	0	8,990	254	9,244
1979		0			0			37	
1980	7,732	0	7,732	0	0	0	10,840	95	10,935
1981	3,101	0	3,101	0	0	0	6,564	54	6,618
1982	13,742	0	13,742	0	0	0	19,757	346	20,103
1983	4,583	0	4,583	0	0	0	11,135	463	11,598
1984	8,322	0	8,322	351	0	351	17,983	325	18,308
1985	1,138	68	1,206	20	0	20	3,610	429	4,039
1986	3,172	62	3,234	19	0	19	9,913	811	10,724
1987	1,304	0	1,304	924	21	945	5,976	529	6,505
1988	2,912	0	2,912	782	0	782	10,715	254	10,969
1989	3,564	10	3,574	165	0	165	9,587	51	9,638
1990	7,647	0	7,647	198	0	198	12,439	0	12,439
1991	1,738	91	1,829	237	0	237	9,594	150	9,744
1992	6,403	293	6,696	131	0	131	11,932	521	12,453
1993	2,250	0	2,250	10	0	10	7,329	452	7,781
1994	7,051	51	7,102	18	0	18	13,752	299	14,051
1995	928	38	966	104	0	104	5,569	359	5,928
1996	5,972	10	5,982	100	0	100	14,685	626	15,311
1997	1,458	0	1,458	30	0	30	7,265	272	7,537
1998	6,939	13	6,952	16	0	16	12,668	190	12,858
1999	3,039	12	3,051	0	0	0	9,462	424	9,886
2000	2,886	0	2,886	45	0	45	12,358	735	13,093
Avg (90-99)	4,343	51	4,393	84	0	84	10,470	329	10,799
Avg (95-99)	3,667	15	3,682	50	0	50	9,930	374	10,304

UNALAKLEET RIVER SALMON FISHERIES

Fishery Description and Historical Perspective

The Unalakleet River supports substantial runs of chinook, chum, coho and pink salmon. Guided and unguided fishing effort is primarily focused on chinook and coho salmon, but chum and pink salmon are also harvested. The City of Unalakleet with a population of about 800 is located on the shore of Norton Sound at the mouth of the river. Daily air service from Anchorage and Nome provides access for anglers visiting the Unalakleet area. The U. S. Air Force operated a sport fishing recreational camp on the Unalakleet River during the 1960s, and a commercial sport fishing lodge was constructed there in the late 1960s. This fishing lodge is still being operated, although it has expanded in size and has had several owners. The Unalakleet Native Corporation has owned the lodge for several years and contracted operations. The lodge is currently in private ownership. The lodge is located about 8 miles upstream on the river, which hosts around 200 visiting anglers each year. Several local residents also guide anglers on the river, and guiding operations from the Yukon River drainage sometimes visit the river during the peak of the chinook and coho salmon runs. The majority of angling, however, is by unguided anglers. An unpublished survey by the Division of Sport Fish estimated that only about 8.5% of salmon anglers on the Unalakleet River were guided. The average annual sport harvest of salmon of all species from the Unalakleet River from 1990 to 1999 has been about 3,682 fish. Coho comprised about 61% of the average harvest while chinook made up about 10% (Mills 1991-1994, Howe et al. 1995, 1996, 2000a-d). The harvest increased to about 4,800 salmon in 1997 and 6,263 salmon in 1999, declining to 5,859 in 2000 (Table 10). Coho comprised 56% of the 1997 harvest and 43% of the 1999 harvest, and 71% of the 2000 harvest.

Recent Fishery Performance

During 1997, 1998 and 2000, the Unalakleet River sustained the highest sport fishing effort of any single river in the NWMA. In 2000, effort on the Unalakleet River increased to 6,257 angler days, a 50% increase from 4,176 angler days in 1999 (Table 8). An estimated total of 5,859 salmon were harvested of which 71% (4,150) were coho, and about 6% (345) were chinook, and 16% (961) were pink salmon. Approximately 39% of the entire NWMA harvest of chinook salmon, and 56% of the coho harvest were taken from the Unalakleet River in 2000. The chinook salmon run usually begins in mid-June, peaks during the last week of June and continues through mid-July. Anglers access the river by boat from the village of Unalakleet and are comprised of a mix of local residents, visitors who rent boats or fish with friends, and visitors who either stay at the Unalakleet Lodge or are guided by local resident guides. Most sport fishing effort occurs in the lower 15 miles of the Unalakleet River and in the lower 5 miles of the North River which enters the Unalakleet about 7 miles upstream from its mouth. The estimated harvest of 842 chinook, from the very strong 1997 run, was the second highest on record. During 1998, the estimated harvest was 513 chinook, dropping to 415 in 1999 and 345 in 2000 (Table 10). The total escapements of chinook into the Unalakleet River were estimated for the first time in 1997 and 1998 by expanding the tower estimate from the North River to include the entire drainage based on proportions of radio tagged fish moving up each drainage. In 1997 and 1998, chinook escapement into the Unalakleet River was estimated at 11,204 and 5,220 respectively. A similar expansion would give an estimate of 5,673 chinook for 1999, 2,615 for 2000, and 3,343 for 2001.

Over the past five years (1995-1999) the commercial harvests of chinook salmon in the Unalakleet subdistrict has averaged 5,734 fish (Table 1). Over the course of the fishery since

Table 10.-Sport fish effort, harvest, and catch estimates by species for the Unalakleet River, 1990-2000.

	Year									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	<u>Effort</u>									
Number of Anglers	482	917	685	625	777	1,009	695	941	835	995
Number of Trips	1,642	3,236	2,256	1,398	2,192	3,376	1,886	3,366	3,197	1,726
No. Angler Days	3,974	5,616	2,433	2,153	2,349	3,832	2,539	4,393	3,795	4,176
	<u>Harvest</u>									
Chinook Salmon	276	296	117	382	379	259	384	842	513	415
Coho Salmon	1,826	2,180	1,555	643	2,425	2,033	3,411	2,784	2,742	2,691
Chum Salmon	298	497	379	116	220	207	463	228	447	211
Pink Salmon	1,180	437	779	89	402	222	59	1,055	434	2,946
Dolly Varden	614	1,648	746	602	679	1,061	1,506	936	588	2,384
Arctic Grayling	99	1,909	114	131	353	300	420	210	144	277
Total Fish Harvest	4,293	6,967	3,690	1,963	4,458	4,082	6,243	6,055	4,868	8,924
	<u>Catch</u>									
Chinook Salmon	361	375	476	2,340	517	588	2,059	5,144	1,539	669
Coho Salmon	3,396	2,882	2,802	1,572	2,488	3,086	5,863	4,020	3,213	9,593
Chum Salmon	379	692	1,412	515	561	966	1,589	1,323	2,218	1,916
Pink Salmon	1,513	559	6,503	605	1,020	799	2,594	4,101	4,853	3,475
Dolly Varden	2,222	2,267	1,942	964	1,253	2,732	3,170	4,400	2,336	10,460
Arctic Grayling	448	2,813	1,022	874	1,476	1,332	1,694	4,918	3,256	6,089
Total Fish Catch	8,319	9,588	14,157	6,870	7,315	9,503	16,969	23,906	17,415	32,202

-continued-

Table 10.-Page 2 of 2.

	Year		
	2000	Average (90-99)	Average (95-99)
	<u>Effort</u>		
Number of Anglers	1,002	796	895
Number of Trips	3,415	2,428	2,710
No. Angler Days	6,257	3,526	3,747
	<u>Harvest</u>		
Chinook Salmon	345	386	483
Coho Salmon	4,150	2,229	2,732
Chum Salmon	403	307	311
Pink Salmon	961	760	943
Dolly Varden	4,462	1,076	1,295
Arctic Grayling	538	396	270
Total Fish Harvest	10,859	5,154	6,034
	<u>Catch</u>		
Chinook Salmon	1,045	1,407	2,000
Coho Salmon	9,287	3,892	5,155
Chum Salmon	3,652	1,157	1,602
Pink Salmon	3,982	2,602	3,164
Dolly Varden	10,293	3,175	4,620
Arctic Grayling	6,814	2,392	3,458
Total Fish Catch	35,073	14,624	19,999

1961, harvests have ranged from 960 in 1969 to 12,621 in 1985. In 1998, 6,413 chinook were harvested in this fishery, in 1999, 1,927 were taken, in 2000, 582 were taken, and in 2001, only 213 were commercially harvested. Commercial fish managers believe that some of the Unalakleet harvest is usually comprised of Yukon River stocks that mill in Norton Sound before moving up the Yukon River. Records of subsistence harvests of chinook salmon in Unalakleet have ranged from 90 fish in 1966 to 6,325 fish in 1997 (Table 5). The recent five-year average (1995-1999) harvest was 4,670 fish. The 2000 subsistence harvest was 2,429 fish. The sport fish harvest over the same 5-year period has averaged 483 fish or about 5% of the total Unalakleet harvest.

Coho are the most sought after salmon species in the Unalakleet drainage. The run usually begins around August 1, peaks during mid-August and continues through early September. The sport harvest of coho, from 1995 to 1999, has averaged 2,732 fish, and has remained relatively stable since 1997, however there was a marked increase in harvest to 4,150 coho in 2000 (Table 10). The 1999 estimated harvest of coho in the Unalakleet River was 2,691 fish (Howe et al. 2000c). The coho fishery is more consumptive than other Unalakleet salmon fisheries. Approximately 53% of coho caught are harvested while about 24%, 19%, and 30% (1995-99 average) of chinook, chum and pink salmon caught are harvested.

From 1995-1999 commercial harvests of coho salmon in the Unalakleet subdistrict have averaged 28,871 fish (Table 1). Since 1961, commercial harvests of coho have ranged from 79 in 1964 to 71,019 in 1994 (Table 1). The commercial harvest has trended downward over the past four years. In 1998, 24,534 were harvested, and in 1999, 10,264 were taken. This trend reversed in the 2000 season when 29,803 coho were harvested. Subsistence harvests of coho salmon in the community of Unalakleet averaged 10,727 fish between 1995 and 1999. The 2000 harvest was 5,878 coho. The sport fish harvest over the same period has averaged 2,732 fish, or about 7% of the total Unalakleet harvest. Reliable escapement data for coho salmon in the Unalakleet drainage are not available.

Sport Fishery Management Objectives

There have been no specific management objectives identified for salmon fisheries on the Unalakleet River. In comparison to commercial and subsistence salmon harvests, sport harvests are small and have a limited impact on salmon stocks. The only possible exception is the coho harvest, however, escapement data are lacking, and it is not possible to determine the impact of the sport harvest on the spawning escapement. The goal of sport fishery management in the Unalakleet River is to maintain opportunity for anglers to participate in the fisheries. Emergency actions to restrict harvest are generally not considered unless other harvests, and escapement monitoring projects indicate that a particular run is small and that restrictions in subsistence fisheries may be necessary in order to allow for sufficient spawning escapement. Biological Escapement Goals (BEGs) based on tower estimates are being developed, but will not be established until more years of reliable tower count data have been accumulated. When BEGs are in place, more precise management to attain those goals will become possible.

Current Issues

Although sport fishing has been ongoing in the Unalakleet River drainage for many years, there is some local resentment of visiting anglers because some Unalakleet residents feel that “outsiders” are competing for the local salmon resources. Declines in chum and coho salmon runs throughout western Alaska have impacted the Unalakleet River drainage, although the effect appears to be less dramatic than in Nome subdistrict streams where chum runs have a long

history of being depressed. While the commercial harvests of chinook in the Unalakleet Subdistrict have remained relatively stable, except for 2000, the commercial harvests of coho have declined during the past three years with the 1999 harvest of 10,264 being the lowest on record. The harvest in 2000 rebounded to nearly 30,000, but dropped again in 2001 to 15,102. The upper reaches of the Unalakleet River are a National Wild and Scenic River under federal management. With the recent federal takeover of subsistence management on federal waters, the possibility exists that subsistence management in the upper reaches of the river could affect sport fishing opportunity in the Unalakleet River.

Recent and Ongoing Research and Management Activities

Salmon escapements in the Unalakleet River are monitored using a counting tower in the North River, a test net in the Unalakleet River downstream from the mouth of the North River, and by aerial surveys. The tower is a cooperative project funded and operated by the Kawarek Corporation with guidance by the ADF&G, CFMD. Aerial surveys are difficult in the Unalakleet River because of its dark bottom and tannic stained water. These surveys provide a minimum escapement, but are unreliable as a total escapement estimate in this river. Water in the North River is clear, and the tower provides a reliable estimate of escapement into that system in years for which counts are obtained.

A two-year research project was initiated on the Unalakleet River in 1997 to estimate the proportions of the chinook salmon escapement that spawn in the North River and the main Unalakleet River upstream from the North River. In 1997, 37.2% of the radio tagged chinook spawned in the North River, and 62.8% spawned in the remainder of the drainage (Wuttig 1998). Proportions estimated in 1998 were similar, 40.1% in the North River and 59.9% in the remainder of the Unalakleet drainage. These relative proportions can now be used to expand the North River tower estimate to allow estimation of the escapement in the entire system. The sport fish staff have frequently assisted and cooperated informally with the Commercial Fisheries Division on projects, including the partial funding of spawning escapement counting towers, surveys for abundance, and observations on spawning concentrations. EOs restricting the harvest of salmon are usually coordinated with the Commercial Fisheries Division. There have been no EOs that have affected Unalakleet River salmon sport fisheries during this reporting period. Because of the low run of coho salmon in eastern Norton Sound in 1999, an EO was issued that lowered the “other salmon” sport fishing bag limit from ten fish per day to three fish per day. The “other salmon” bag limit of 10 fish, while it may be appropriate for pink salmon during years of high abundance, was felt by some to be excessive, especially for coho. The BOF reduced the “other salmon” limit to five per day at their December 2000 meeting. In 1999, about 72% of the coho salmon captured in the Unalakleet River were released, and in 2000, 55% were released. A department study (Vincent-Lang et al. 1993) found high levels of catch and release mortality with coho captured in estuarine waters of the Little Susitna River. Local residents have expressed concern about mortality of fish captured and released in sport fisheries, and a proposal to eliminate the release of sport caught fish in the Unalakleet River was recently heard by the BOF. The result was a regulation that prohibits sport fishing in estuarine waters of the Unalakleet River downstream from the South River for the remainder of the day after an angler has retained a bag limit of coho. A project was undertaken in 2001 to document relative catch and release mortality of coho in the Unalakleet River from its lower reaches progressively into freshwater upstream areas. Another regulation passed in December 2000 made it unlawful to completely remove a salmon from the water if that salmon was to be released.

NOME AREA ROADSIDE SALMON FISHERIES

Fishery Description and Historical Perspective

Nine rivers accessible from the road system near Nome sustain some level of sport fishing effort for salmon. Estimated harvests from these rivers have averaged about 7,800 salmon annually, of which coho and pink salmon have comprised about 85%. In all but the last two years, the Nome River has sustained more sport fishing effort than any other single water body in northwestern Alaska because of its proximity to Nome and the adjacent road. Sport fishing on the Nome River has accounted for an annual average of 21% of all the fishing effort in the entire northwestern management area since 1987 (Table 8). An average of about 2,550 salmon have been harvested annually from the Nome River over the past 10 years, approximately 76% have been pink salmon (Table 11). The Fish/Niukluk rivers are also a popular sport fishing location for salmon.

Two guiding operations with small lodges are located on the Niukluk River. In addition, Nome based guides fish these rivers as well as other road accessible waters. Many residents of Nome have summer cabins on the Niukluk River at Council or fish camps along the river. Since the construction of the bridge over Safety Sound in 1980, and improvements to the road, access to the Fish/Niukluk rivers has increased, and this area has become a prime destination for the road bound angler. The drainage sustains an average annual effort of about 2,800 angler days. About 1,200 salmon are harvested annually from the Fish/Niukluk rivers (Table 12). The Pilgrim River, with its headwaters at Salmon Lake is another popular salmon fishery. All five species of North American Pacific salmon occur in the Pilgrim River. Sockeye spawn in Salmon Lake and the runs appear to be responding positively to lake fertilization restoration efforts currently underway. There is a Bureau of Land Management (BLM) campground at the outlet of Salmon Lake, and from there the river can be floated for about 25 river miles to the bridge at mile 65 of the Kougarok Road. Riverboats can be launched at the bridge for access to downstream locations. The Pilgrim River sustains an average annual effort of about 800 angler days and about 150 salmon are harvested annually (Table 13). The Fish/Niukluk and the Pilgrim rivers are rivers where fishing for chum salmon is still allowed, however annual (1995-1999 average) harvests have been only 15 chums from the Pilgrim and 40 chums from the Fish/Niukluk (Tables 12 and 13). The mouth of the Snake River is in downtown Nome, and this small stream can also be accessed from a bridge at about mile 8 of the Teller Road and from the Glacier Creek Road. The Snake River sustains an average annual effort of about 1,000 angler days, with an annual harvest of about 450 salmon, about 36% coho and 50% pink salmon (Table 14). Other road accessible waters include the Solomon, Kuzitrin, Penny, Cripple and Sinuk rivers (Tables 15 – 19). The annual harvests in these rivers combined for the past five years (1995-1999) have averaged 236 coho, 8 chum, and 410 pink salmon. During years of high pink salmon abundance (even years) this species dominates catches and harvests in some Nome roadside streams.

Recent Fishery Performance

The alternate year strong pink salmon run in Norton Sound strongly influences the salmon sport fishery on road accessible streams. This relationship is strongest in the Nome River because of its proximity to Nome and ease of access to visitors and residents alike. Salmon harvests from the Nome River increased 10 fold between 1997 and 1998, and dropped 10 fold in 1999, reflecting the strong even-year pink salmon run in spite of a reduced amount of angler effort. Effort on the Nome River has dropped continuously from a high of 7,200 angler days in 1990 to about 1,460 angler days in 1999 and 2000. The pink salmon harvest of about 1,985 fish in 1998 may also have been influenced by reduced subsistence opportunity on depressed chum salmon

Table 11.—Sport fish effort and harvests by species from the Nome River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	Salmon					All Salmon	Dolly Varden	Arctic Grayling	Whitefish
			King	Coho	Red	Pink	Chum				
<u>Harvest</u>											
1983	0	3,908	93	204	0	1,782	538	2,617	2,468	464	0
1984	1,288	5,714	13	2,648	0	4,128	325	7,114	935	376	13
1985	1,220	6,514	20	209	0	349	189	767	1,236	528	0
1986	1,087	6,023	0	415	0	491	76	982	1,057	491	0
1987	674	1,865	0	163	0	235	0	398	906	344	0
1988	1,733	6,058	0	1,455	0	528	273	2,256	2,365	946	18
1989	1,231	6,569	19	1,233	0	1,573	495	3,320	3,551	2,032	131
1990	1,625	7,194	39	407	35	2,651	122	3,254	1,078	33	0
1991	1,277	4,646	22	417	0	356	241	1,036	1,220	186	13
1992	1,433	6,455	16	713	0	4,397	0	5,126	573	0	0
1993	1,181	3,633	93	602	0	723	0	1,418	917	0	0
1994	1,025	5,116	0	326	0	4,103	0	4,429	431	16	0
1995	859	3,044	0	143	0	230	0	373	462	0	0
1996	947	2,920	0	598	0	3,280	0	3,878	873	0	0
1997	691	1,914	10	295	0	83	0	388	328	0	0
1998	636	1,371	0	189	0	1,985	0	2,174	302	0	0
1999	564	1,463	0	219	0	0	0	219	791	0	0
2000	450	1,455	0	342	0	578	0	920	340	0	0
Avg 90-99	1,024	3,776	18	391	4	1,781	36	2,230	698	24	1
Avg 95-99	739	2,142	2	289	0	1,116	0	1,406	551	0	0
<u>Catches</u>											
1990	1,625	7,194	48	896	35	5,483	825	7,287	2,271	613	0
1991	1,277	4,646	22	869	0	894	389	2,174	3,725	1,363	13
1992	1,433	6,455	23	1,466	0	9,810	266	11,565	1,130	90	9
1993	1,181	3,633	121	764	0	1,756	175	2,816	5,153	569	0
1994	1,025	5,116	0	386	0	6,190	36	6,612	631	1,111	0
1995	859	3,044	0	228	0	980	478	1,686	1,474	571	0
1996	947	2,920	21	788	0	5,898	432	7,139	1,311	497	0
1997	691	1,914	20	447	0	190	113	770	873	569	0
1998	636	1,371	19	863	0	3,482	8	4,372	319	207	0
1999	564	1,463	0	231	0	13	0	244	1,486	300	0
2000	450	1,455	0	385	0	876	20	1,281	431	10	0
Avg 90-99	1,024	3,776	27	694	4	3,470	272	4,467	1,837	589	2
Avg 95-99	739	2,142	12	511	0	2,113	206	2,842	1,093	429	0

Table 12.—Sport fish effort and harvests by species from the Fish/Niukluk River 1983-2000, catches 1990-2000.

Year	Num. Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Northern Pike	Whitefish	Burbot
Harvest													
1983	0	1,999	0	1,355	0	631	371	2,357	2,208	5,160	557	0	0
1984	521	1,115	0	1,090	0	78	52	1,220	325	376	13	0	13
1985	466	889	0	40	0	70	10	120	195	945	0	0	35
1986	850	1,888	189	1,359	0	415	0	1,963	1,359	1,114	19	0	0
1987	809	2,473	36	1,032	0	127	72	1,267	1,376	2,119	471	0	0
1988	866	2,245	0	800	0	73	127	1,000	891	1,237	0	0	0
1989	641	2,124	0	728	0	233	107	1,068	734	808	0	70	0
1990	580	2,059	0	267	0	638	216	1,121	348	415	17	0	0
1991	881	2,524	14	977	0	356	272	1,619	1,474	1,320	283	13	35
1992	773	2,742	0	753	0	357	15	1,125	303	158	43	0	0
1993	832	3,962	9	1,185	0	278	514	1,986	1,003	619	75	9	21
1994	766	3,082	10	1,122	0	231	119	1,482	708	644	99	0	0
1995	918	2,603	18	818	0	136	27	999	368	430	0	37	34
1996	692	2,120	11	1,652	0	404	166	2,233	402	313	145	0	24
1997	722	3,017	71	462	0	58	0	591	2,071	734	30	131	148
1998	229	1,344	0	316	0	0	0	316	160	16	0	0	84
1999	819	4,825	44	1,365	0	80	0	1,489	1,952	860	28	0	89
2000	534	3,451	174	1,165	0	51	0	1,390	1,687	442	57	0	0
Avg 90-99	721	2,828	18	892	0	254	133	1,296	879	551	72	19	44
Avg 95-99	676	2,782	29	923	0	136	39	1,126	991	471	41	34	76

-continued-

Table 12.–Page 2 of 2.

Year	Num. Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Northern Pike	Whitefish	Burbot
Catches													
1990	580	2,059	0	1,140	0	2,096	487	3,723	912	2,189	133	0	0
1991	881	2,524	22	1,417	0	579	521	2,539	3,439	7,261	764	39	35
1992	773	2,742	0	1,555	0	1,969	326	3,850	1,041	2,171	256	0	0
1993	832	3,962	9	1,804	0	909	945	3,667	6,130	5,976	75	44	21
1994	766	3,082	29	1,448	0	2,052	1,271	4,800	2,125	2,398	596	56	0
1995	918	2,603	18	1,401	0	300	428	2,147	662	1,169	137	65	34
1996	692	2,120	64	3,348	0	3,512	1,660	8,584	1,872	4,653	513	94	24
1997	722	3,017	125	1,751	106	1,209	714	3,905	9,952	10,452	423	315	277
1998	229	1,344	15	772	0	3,252	822	4,861	1,390	8,159	189	198	84
1999	819	4,825	55	2,151	0	187	265	2,658	5,601	7,245	264	0	101
2000	534	3,451	207	2,952	0	3,989	952	8,100	2,261	1,701	114	210	0
Avg 90-98	721	2,828	34	1,679	11	1,607	744	4,073	3,312	5,167	335	81	58
Avg 94-98	676	2,782	55	1,885	21	1,692	778	4,431	3,895	6,336	305	134	104

Table 13.—Sport fish effort and harvests by species from the Pilgrim River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Northern Pike	Whitefish	Burbot
Harvest													
1983	0	597	0	37	0	37	111	185	445	761	148	0	0
1984	398	732	65	195	78	104	0	442	195	247	13	0	0
1985	363	375	10	20	20	50	100	200	14	319	0	0	0
1986	238	868	38	76	0	0	113	227	189	227	529	0	0
1987	438	1,159	72	109	435	0	272	888	163	272	199	0	0
1988	836	4,822	55	218	746	36	346	1,401	327	109	91	36	0
1989	1,050	1,678	68	204	78	301	272	923	603	516	415	131	10
1990	862	1,710	19	81	93	208	41	442	498	415	1,194	0	33
1991	1,169	3,183	51	310	124	81	85	651	1,015	459	608	13	0
1992	686	1,184	55	57	66	55	106	339	131	91	231	0	0
1993	570	1,195	28	191	10	0	0	229	730	75	207	0	0
1994	323	844	0	134	9	154	0	297	63	49	108	0	0
1995	531	1,253	19	113	62	0	73	267	74	52	68	18	11
1996	445	840	0	133	84	49	0	266	388	73	75	0	0
1997	456	820	45	0	20	0	0	65	65	81	117	0	0
1998	392	546	32	6	0	0	0	38	14	0	26	0	0
1999	283	433	0	33	0	0	0	33	45	11	94	9	0
2000	177	753	0	179	32	6	0	217	0	57	271	0	0
Avg 90-99	572	1,201	25	106	47	55	31	263	302	131	273	4	4
Avg 95-99	421	778	19	57	33	10	15	134	117	43	76	5	2
Catches													
1990	862	1,710	57	186	198	736	460	1,637	845	1,476	2,918	0	33
1991	1,169	3,183	65	476	374	406	194	1,515	3,155	4,463	1,499	13	0
1992	686	1,184	55	162	90	714	197	1,218	279	526	863	18	0
1993	570	1,195	92	325	106	392	254	1,169	3,038	2,362	959	0	11
1994	323	844	0	436	18	350	146	950	180	266	358	0	0
1995	531	1,253	19	472	163	58	232	944	294	370	656	27	11
1996	445	840	0	265	235	364	133	997	509	785	334	0	0
1997	456	820	90	49	115	0	15	269	254	429	262	0	0
1998	392	546	32	65	145	263	44	549	41	65	77	0	0
1999	283	433	20	77	177	0	0	274	585	694	104	9	0
2000	177	753	0	200	32	109	24	365	0	221	596	0	0
Avg 90-99	572	1,201	43	251	162	328	168	952	918	1,144	803	7	6
Avg 95-99	421	778	32	186	167	137	85	607	337	469	287	7	2

Table 14.—Sport fish effort and harvests by species from the Snake River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Whitefish
Harvest											
1983	0	119	19	0	0	37	0	56	223	278	0
1984	245	418	0	273	0	143	0	416	65	26	0
1985	129	361	0	120	0	0	0	120	0	139	0
1986	136	850	0	94	0	378	94	566	57	378	0
1987											
1988	340	2,128	0	800	0	546	437	1,783	218	709	0
1989	148	436	0	10	0	291	97	398	44	101	0
1990	298	775	10	47	0	111	41	209	66	116	0
1991	647	2,384	7	798	62	71	93	1,031	1,252	402	0
1992	461	2,379	8	510	0	183	0	701	115	16	0
1993	622	1,468	9	248	0	151	0	408	331	467	0
1994	341	880	0	145	0	452	7	604	117	32	0
1995	640	1,968	0	85	0	19	0	104	131	18	9
1996	433	1,269	0	426	0	659	0	1,085	97	121	0
1997	235	445	0	98	0	0	0	98	81	0	0
1998	164	376	0	0	0	463	0	765	0	8	0
1999	313	977	0	209	0	0	0	209	44	113	0
2000	185	377	0	209	0	103	0	312	199	16	0
Avg 90-99	415	1,292	3	257	6	211	14	521	223	129	1
Avg 95-99	357	1,007	0	164	0	228	0	452	71	52	2
Catches											
1990	298	775	29	58	0	222	122	431	315	199	0
1991	647	2,384	14	1,798	73	234	109	2,228	3,471	2,096	0
1992	461	2,379	8	640	0	1,182	0	1,830	180	158	0
1993	622	1,468	9	306	0	429	37	781	1,003	1,614	0
1994	341	880	60	235	0	648	37	980	420	377	0
1995	640	1,968	0	245	0	300	189	734	507	887	9
1996	433	1,269	0	530	0	967	111	1,608	255	1,055	0
1997	235	445	0	118	0	0	9	127	243	123	135
1998	164	376	0	64	0	463	0	527	0	218	0
1999	313	977	0	606	0	0	0	606	257	723	0
2000	185	377	0	209	0	103	0	312	199	449	0
Avg 90-99	415	1,292	12	460	7	445	61	985	665	745	14
Avg 95-99	357	1,007	0	313	0	346	62	720	252	601	29

Table 15.—Sport fish effort and harvests by species from the Solomon River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Whitefish
<u>Harvests</u>											
1983	0	30	0	0	0	0	0	0	37	0	0
1984	215	766	0	299	0	0	0	299	221	0	0
1985	391	2,667	0	80	0	120	219	419	611	0	0
1986	102	102	0	0	0	38	0	38	0	0	0
1987	270	272	0	109	0	0	72	181	1,576	91	0
1988	155	309	0	18	0	0	0	18	36	127	0
1989	263	492	10	136	0	243	49	438	745	152	0
1990	216	458	0	12	0	361	14	387	182	17	0
1991	593	1,057	7	83	0	173	0	263	2,219	158	0
1992	685	962	0	316	0	210	0	526	131	0	0
1993	317	1,404	28	420	0	259	0	707	893	0	61
1994	328	1,193	0	235	0	256	0	491	269	0	19
1995	426	781	0	38	0	87	0	125	366	0	0
1996	230	335	0	142	0	0	0	142	49	0	0
1997	250	434	0	10	0	15	0	25	186	0	26
1998	245	340	0	0	16	154	0	170	383	0	0
1999	193	438	0	22	0	0	0	22	154	0	0
2000	88	242	0	32	0	113	0	145	0	0	0
Avg 90-99	348	740	4	128	2	152	1	286	483	18	11
Avg 95-99	269	466	0	42	3	51	0	97	228	0	5
<u>Catches</u>											
1990	216	458	0	12	58	736	108	914	415	33	0
1991	593	1,057	7	83	0	620	47	757	4,549	602	0
1992	685	962	0	316	0	998	91	1,405	197	38	0
1993	317	1,404	47	650	0	633	0	1,330	1,725	140	61
1994	328	1,193	0	255	0	784	7	1,046	520	212	19
1995	426	781	0	208	0	190	22	420	734	200	0
1996	230	335	0	237	0	39	0	276	49	97	0
1997	250	434	0	39	0	74	0	113	415	703	26
1998	245	340	17	59	64	433	0	573	410	0	0
1999	193	438	0	185	0	13	0	198	573	21	0
2000	88	242	57	53	119	288	278	795	1,537	853	0
Avg 90-99	348	740	7	204	12	452	28	703	959	205	11
Avg 95-99	269	466	3	146	13	150	4	316	436	204	5

Table 16.—Sport fish effort and harvests by species from the Kuzitrin River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	King Salmon	Coho Salmon	Red Salmon	Pink Salmon	Chum Salmon	All Salmon	Dolly Varden	Arctic Grayling	Northern Pike	Whitefish	Burbot
<u>Harvest</u>													
1983	0	179	0	0	0	0	0	0	0	371	0	0	0
1984	153	279	0	0	0	325	0	325	260	195	156	0	0
1985	103	84	0	0	0	0	0	0	0	195	14	0	0
1986	204	318	0	0	0	0	0	0	38	189	151	0	0
1987	135	1,392	0	0	0	0	0	0	91	181	127	0	0
1988	217	1,037	0	0	36	55	54	145	109	1,255	437	36	0
1989	115	313	0	0	0	0	0	0	0	283	233	0	0
1990	282	572	0	0	0	28	14	42	0	133	746	0	0
1991	414	836	0	0	10	10	0	20	222	286	481	0	0
1992	287	469	0	8	0	46	0	54	8	0	128	0	0
1993	293	463	0	0	0	0	0	0	146	101	209	0	0
1994	267	643	0	109	0	0	0	109	0	98	169	0	0
1995	214	413	0	0	0	0	40	40	22	44	137	0	0
1996	230	483	0	0	0	39	0	39	85	230	497	0	0
1997	236	440	0	0	0	0	0	0	0	108	216	0	0
1998	122	122	0	0	0	0	0	0	0	8	38	0	0
1999	197	355	0	0	0	0	0	0	55	23	233	0	0
2000	111	373	0	0	0	0	0	0	0	64	63	36	0
Avg 90-99	254	480	0	12	1	12	5	30	54	103	285	0	0
Avg 95-99	200	363	0	0	0	8	8	16	32	83	224	0	0
<u>Catches</u>													
1990	282	572	0	0	0	194	27	221	0	298	1,094	0	0
1991	414	836	0	0	10	41	0	51	333	1,349	1,937	0	0
1992	287	469	0	89	0	82	0	171	8	481	1,956	37	0
1993	293	463	0	0	0	0	0	0	263	288	751	9	0
1994	267	643	0	109	0	16	0	125	0	351	722	0	0
1995	214	413	0	0	0	0	40	40	54	192	1,005	0	11
1996	230	483	0	0	0	49	11	60	85	388	2,015	0	0
1997	236	440	0	0	64	0	0	64	85	1,068	1,503	0	0
1998	122	122	0	0	0	0	0	0	8	0	38	0	0
1999	197	355	0	7	7	0	0	14	176	158	1,840	0	0
2000	111	373	0	0	0	103	0	103	0	859	578	36	0
Avg 90-99	254	480	0	21	8	38	8	75	101	457	1,286	5	1
Avg 95-99	200	363	0	1	14	10	10	36	82	361	1,280	0	2

Table 17.—Sport fish effort and harvests by species from the Penny River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	Salmon					All Salmon	Dolly Varden	Arctic Grayling
			King	Coho	Red	Pink	Chum			
Harvest										
1983	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1984	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1985	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1986	306	396	0	113	0	396	189	698	189	189
1987	34	34	0	0	0	0	0	0	0	0
1988	31	91	0	73	0	0	0	73	73	0
1989	33	34	0	10	0	0	0	10	99	30
1990	66	343	0	35	0	416	0	451	0	0
1991	36	61	0	0	0	0	0	0	95	0
1992	37	37	0	16	0	0	0	16	0	0
1993	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1994	78	101	0	0	9	34	0	43	46	0
1995	42	43	0	0	0	0	0	0	0	0
1996	40	80	0	95	0	0	0	95	12	0
1997	15	15	0	0	0	0	0	0	0	0
1998	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1999	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
2000	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
Avg 90-99	45	97	0	21	1	64	0	86	22	0
Avg 95-99	32	46	0	32	0	0	0	32	4	0
Catches										
1990	66	343	0	35	0	416	0	451	0	0
1991	36	61	0	0	0	0	0	0	95	0
1992	37	37	0	16	0	0	0	16	0	0
1993	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1994	78	101	0	20	87	341	0	448	84	0
1995	42	43	0	0	0	0	0	0	0	0
1996	40	80	0	95	0	0	0	95	61	73
1997	15	15	0	0	0	0	0	0	0	20
1998	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
1999	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
2000	nd	nd	nd	nd	nd	nd	Nd	nd	nd	nd
Avg 90-99	45	97	0	24	12	108	0	144	34	13
Avg 95-99	32	46	0	32	0	0	0	32	20	31

Table 18.—Sport fish effort and harvests by species from the Cripple River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	Salmon					All Salmon	Dolly Varden	Arctic Grayling
			King	Coho	Red	Pink	Chum			
Harvest										
1983	0	179	0	37	0	93	0	130	111	0
1984	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1985	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1986	102	170	0	113	0	189	189	491	57	0
1987	101	181	0	0	0	0	0	0	0	0
1988	155	509	0	528	0	0	0	528	127	127
1989	66	257	0	78	0	165	39	282	0	0
1990	66	813	0	140	0	1,138	41	1,319	663	0
1991	108	221	0	24	0	0	0	24	0	0
1992	37	149	0	32	0	92	0	124	0	0
1993	125	1,121	0	57	0	212	0	269	0	0
1994	91	320	0	122	0	85	0	207	27	0
1995	78	272	0	10	0	84	0	94	38	0
1996	164	307	0	134	0	156	0	290	24	0
1997	75	166	0	11	0	11	0	22	0	0
1998	513	2,303	0	366	0	1,141	0	1,507	272	0
1999	64	66	0	0	0	0	0	0	452	0
2000	120	614	0	149	0	177	0	326	100	0
Avg 90-99	132	574	0	90	0	292	4	386	148	0
Avg 95-99	179	623	0	104	0	278	0	383	157	0
Catches										
1990	66	813	0	314	0	2,665	162	3,141	1,492	0
1991	108	221	0	24	0	0	0	24	0	0
1992	37	149	0	49	0	1,053	0	1,102	0	0
1993	125	1,121	0	57	0	403	0	460	44	0
1994	91	320	0	268	0	426	0	694	27	0
1995	78	272	0	10	0	225	22	257	38	0
1996	164	307	0	219	0	435	318	972	110	0
1997	75	166	0	11	0	22	290	323	0	20
1998	513	2,303	0	4,178	0	6,808	1,331	12,317	570	52
1999	64	66	0	72	0	0	0	72	965	0
2000	120	614	0	239	0	711	66	1,016	100	0
Avg 90-99	132	574	0	520	0	1,204	212	1,936	325	7
Avg 95-99	179	623	0	898	0	1,498	392	2,788	337	14

Table 19.—Sport fish effort and harvests by species from the Sinuk River 1983-2000, and catches 1990-2000.

Year	Number of Anglers	Days Fished	Salmon					All Salmon	Dolly Varden	Arctic Grayling	Whitefish
			King	Coho	Red	Piink	Chum				
Harvest											
1983	0	477	0	0	0	0	19	19	1,132	130	0
1984	306	366	0	234	26	1,272	143	1,675	844	428	0
1985	311	806	0	10	0	120	0	130	292	0	0
1986	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1987	405	5,198	0	0	380	91	72	543	652	724	0
1988	464	1,055	73	91	0	946	146	1,256	146	73	0
1989	230	906	0	10	0	0	10	20	175	51	104
1990	116	343	0	12	0	0	14	26	17	0	0
1991	557	885	0	71	41	51	47	210	729	129	0
1992	436	1,504	0	40	0	293	0	333	139	0	0
1993	463	874	9	96	0	115	0	220	536	37	0
1994	463	1,132	0	109	0	145	0	254	305	8	0
1995	485	1,295	0	19	21	28	0	68	158	18	0
1996	376	553	0	189	8	285	0	482	485	97	0
1997	235	443	0	0	0	54	0	54	346	0	0
1998	75	123	0	0	0	0	0	0	311	8	0
1999	78	244	0	0	0	0	0	0	88	11	0
2000	155	294	0	11	0	10	0	21	59	0	0
Avg 90-99	328	740	1	54	7	97	6	165	311	31	0
Avg 95-99	250	532	0	42	6	73	0	121	278	27	0
Catches											
1990	116	343	0	12	0	0	406	418	66	232	0
1991	557	885	0	167	41	224	186	618	2,584	1,291	0
1992	436	1,504	0	65	0	1,429	15	1,509	770	300	0
1993	463	874	9	143	10	547	28	737	1,179	879	0
1994	463	1,132	0	172	0	348	22	542	830	417	0
1995	485	1,295	0	113	66	125	44	348	723	498	9
1996	376	553	0	246	8	736	200	1,190	618	339	0
1997	235	443	0	196	10	76	160	442	1,249	1,464	0
1998	75	123	0	0	0	0	0	0	311	25	0
1999	78	244	0	0	0	0	0	0	198	22	0
2000	155	294	0	21	0	21	12	54	95	26	0
Avg 90-99	328	740	1	111	14	349	106	580	853	547	1
Avg 95-99	250	532	0	111	17	187	81	396	620	470	2

stocks that likely focused local sport fishing effort on the abundant pink salmon, in part to meet the local need for salmon. The 1999 harvest of coho salmon in the Nome River was about 220 fish, about 76% of the recent five-year average harvest of about 289 fish, and in 2000 the harvest increased to 342 coho (Table 11). Chum salmon fishing has been closed for many years because of depressed stocks and harvests of sockeye and chinook salmon in the Nome River are negligible. A similar declining trend in sport fishing effort was observed in the Fish/Niukluk River system from a high of about 4,000 angler days in 1993 to 1,344 angler days in 1998 (Table 12). However, in 1999, and 2000 effort increased to 4,825 angler days and 3,451 angler days respectively, suggesting a shift in effort away from the Nome subdistrict. Although sport fishing for chum salmon is allowed in this drainage, harvests of all salmon species except coho and chinook were negligible in 2000. The coho harvest in 2000 was about 1,165 fish from an estimated catch of 2,952 fish, and the estimated chinook harvest of 174 fish was the second highest on record. Negligible harvest of pink salmon occurred in 1998 and 2000 in spite of an abundant run of this species with over 1,500,000 counted past the tower in 1998, and 962,000 past the tower in 2000. In 1999 and 2000, fewer than 100 pink salmon were harvested. The Pilgrim River is the other road accessible water where chum salmon fishing is still allowed. Effort there in 2000 was estimated at 753 angler days which is similar to the recent five-year average of 778 angler days (Table 13). Recent harvests of salmon have been small, although 174 coho were harvested in 2000.

Sport Fishery Management Objectives

There have been no specific management objectives identified for salmon fisheries on Nome roadside streams. The goal of sport fishery management within these waters is to maintain opportunity for anglers to participate in the fisheries and to assure that escapement goals are met. Sport fishery harvests are small, and emergency actions to restrict harvest are generally not contemplated unless escapement-monitoring projects indicate that the particular run is small and that restrictions in subsistence fisheries may be necessary. Biological Escapement Goals (BEGs) based aerial surveys are in place, and goals based on tower estimates (Snake and Pilgrim rivers), and weir counts (Nome River) will not be established until more years of reliable data have been accumulated.

Management History and Recent Board of Fisheries and Management Actions

Chum salmon stocks in the Nome area are depressed, and an effort to restore these runs is ongoing. Salmon sport fisheries in northwestern Alaska are managed in cooperation with the Division of Commercial Fisheries. Subsistence uses are given priority. Since the availability of salmon resources is limited and local chum salmon populations are depressed, particularly in the Nome area where sport fishing effort is greatest, the Nome area has most often required restrictive management measures.

In 1984 the BOF reduced the bag and possession limits in the Nome and Snake rivers to 15 salmon other than king salmon, only 5 of which could be chum and coho in combination, and in 1985 all but the lower 2 miles of the Nome River was closed to all sport fishing for salmon by EO.

In 1987, additional regulations were adopted in Seward Peninsula drainages (Cape Prince of Wales to Cape Darby), which reduced the bag and possession limit for salmon other than chinook to 10 per day, 10 in possession, only 3 of which could be chum or coho salmon in combination. The limit for chinook salmon was set at 1 per day and in possession.

The Nome River was closed in July 1990 to the taking of chum salmon on sport fishing gear, and the following year, another EO closed Nome area waters to the retention of both chum and pink salmon. The area affected by this action was more widespread than in previous years and included all waters from the Sinuk River in the west to the Solomon River in the east.

Due to continued low escapements of chum salmon in Nome area streams, a proposal to close sport fishing for chum salmon in the rivers addressed in the 1991 EO was brought before the BOF and enacted into regulation. This regulation is intended to protect chum salmon stocks and will remain in effect until stocks recover and surpluses above the escapement goals are available for harvest by sport anglers.

Two EOs were issued addressing salmon in the Nome area in 1992. The first closed the Tubutulik and Kwiniuk rivers to sport fishing for chum salmon. The second, because of near record pink salmon runs, increased the bag and possession limits for pink salmon from 10 per day to 20 per day in Nome area streams.

During the December 1997 meeting, the BOF adopted two salmon regulation changes for the NWMA. The first established a uniform daily bag and possession limit for chinook salmon in the entire NWMA at one fish. This replaced a three fish (only one over 28 inches) daily bag and possession limit except for the Unalakleet River where a one fish limit was already in place. Since the Unalakleet River has the strongest chinook run in the NWMA, having a more liberal limit in other parts of the area where chinook runs were small made little sense. The other change was for northern Norton Sound which includes the streams accessible from the Nome road system. The “other salmon” aggregate limit of 10 fish per day only 3 of which could be chum or coho was split out to provide separate daily bag and possession limits by species. The new limits were set at 10 pink, 3 coho, 3 chum, and 3 sockeye. The new regulation will provide for more precise management by species, and is less ambiguous for the inexperienced angler. Nome subdistrict streams still remain closed to fishing for chum salmon.

Because of weak coho runs throughout northern Norton Sound, an EO was issued on August 15, 1997 that mandated the release of all coho caught while sport fishing in northern Norton Sound waters, in addition, bait was eliminated as a legal gear while fishing for coho. This action remained in effect until September 30, 1997.

The BOF scheduled a special meeting in Nome for March 1998 to discuss the chum salmon situation in the Nome subdistrict. The BOF directed Nome area residents to create a Subsistence Salmon Working Group to address the issue of the chronic chum salmon shortage and consider the possibility of Tier-II management. The group did not recommend Tier-II management, however in the March 1999 meeting, the BOF directed the department to implement Tier II subsistence management for chum salmon in the Nome subdistrict.

In 2001, EOs affecting sport fishing for salmon were issued in northern Norton Sound. EO No. 3-SS-01-00 (Appendix C) reduced the daily bag and possession limit for coho in most Nome Subdistrict streams and the Pilgrim River and closed the Eldorado, Flambeau and Solomon rivers to fishing for coho.

Current Issues

Chum salmon stocks have steadily declined on the Seward Peninsula since the early 1980s, as evidenced by failure to achieve desired spawning escapements in many key streams where spawners are enumerated. This has created the need for increasingly restrictive sport,

commercial and even subsistence fishing regulations. It is anticipated that until chum salmon populations recover, there will be a need to continue with very restrictive measures to protect local stocks. All rivers in northern Norton Sound from the Sinuk in the west to Topkok in the east are closed to fishing for chum salmon, and will remain closed until runs rebuild. In addition, restrictions to the sport harvest of coho salmon in the Nome area have been necessary during recent years. Increased effort is being directed at the enumeration of coho salmon escapements in Nome area streams using tower and weir projects.

Ongoing Research and Management Activities

Current research and management activities on Nome roadside salmon populations are primarily conducted by the CFMD in conjunction with Kawarek Corporation's fisheries office. These groups cooperatively staff and manage escapement enumeration projects on the Niukluk, Eldorado, Pilgrim and Snake rivers. All projects are counting towers except the Nome River where a weir is run by CFMD throughout the salmon runs. The weir obstructs the movement of all fish, and fish are counted as they are permitted to pass through an opening in the weir several times each day. In addition, the BLM has operated a weir at the outlet of Glacial Lake in 2001 to enumerate sockeye migrating into the lake.

NORTHWESTERN ALASKA DOLLY VARDEN AND ARCTIC CHAR

Fishery Description and Historical Perspective

In the Northwestern Management Area, Arctic char occur in lakes in the Kigluaik Mountains and in some headwater lakes in the Kobuk and Noatak river drainages, while Dolly Varden are common inhabitants of most coastal streams and large rivers (Figure 12). Although the department groups Dolly Varden and Arctic char for bag limits and record keeping, the two species are separate with Arctic char present only as lake resident populations, while Dolly Varden may be present as lake resident, stream resident, dwarf, lake resident or anadromous populations. Arctic char distribution is very limited in the NWMA and the vast majority of char fisheries are directed toward Dolly Varden.

Many northwestern Alaska residents maintain a traditional lifestyle, and are dependent to some degree on locally harvested fish resources. Dolly Varden make up an important part of this traditional harvest, and in Kivalina they outrank salmon and whitefish in importance to the subsistence economy. The number of Dolly Varden harvested for subsistence purposes in northwestern Alaska vastly exceeds the number taken by sport anglers. Intermittent community subsistence harvest estimates dating to 1959 for Kivalina and Noatak (Table 20) and personal observation of the area biologist suggest that 15,000 to 25,000 Dolly Varden are harvested annually in this area, however, the actual magnitude of the annual harvests throughout the NWMA are not known. Fish are captured with gill nets or beach seines during open water periods, and with hook and line during winter. Dolly Varden are also an important subsistence resource in Norton Sound, however their relative importance is minor compared to salmon.

Estimated harvests of Dolly Varden by sport anglers in the Seward Peninsula/Norton Sound sub-area have averaged about 4,600 fish over the past 10 years (Table 21). Observations and aerial surveys suggest that Dolly Varden spawner abundance is low in most rivers, however, spawning occurs in almost all drainages of Norton Sound, some northern Seward Peninsula rivers, and the major drainages of Kotzebue Sound and the Chukchi Sea. Aerial surveys of spawning Dolly Varden conducted during the mid 1980s indicated that about 12,000-15,000 spawn annually in the Noatak drainage (Table 22). Total abundance of spawning Dolly Varden in northwestern

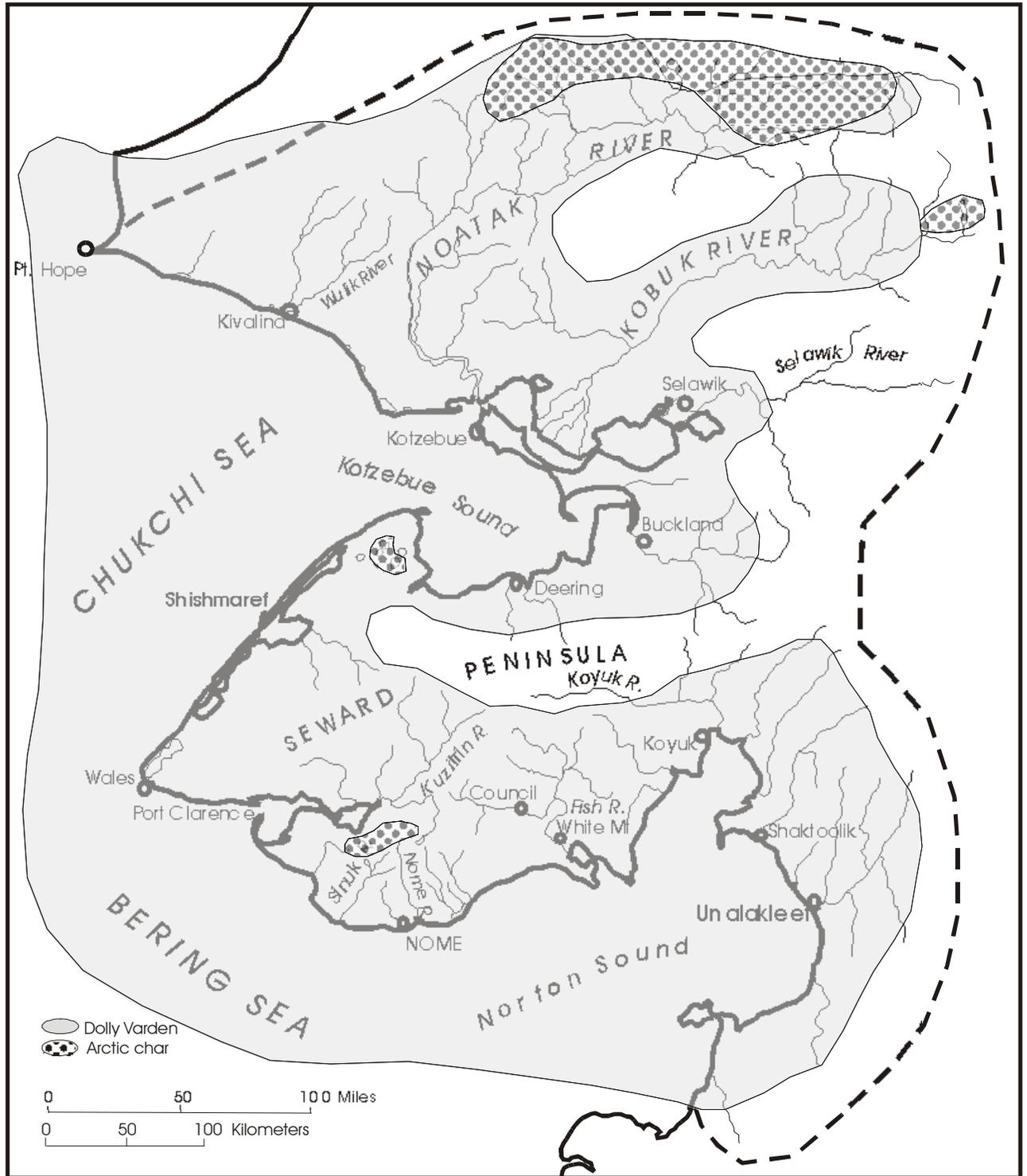


Figure 12.-Dolly Varden and Arctic char distribution in the NWMA.

Table 20.-Documented subsistence harvests of Dolly Varden in Noatak and Kivalina.

Year	Kivalina		Noatak Number
	Number	Pounds	
1959	34,240	85,600 ^a	
1960	49,720	124,300 ^a	
1962			27,623 ^b
1963			4,130
1964		93,995	
1965		28,140	
1968	49,512	120,214	
1969	64,970	152,750	32,350
1970	33,820	79,420	3,700
1971	29,281	68,518	5,320
1972	48,807	114,637	1,492
1979 ^c	14,600		
1980			9,060
1981 ^c	15-18,000		7,220
1982 ^c	18,438	69,059	3,056
1983 ^c	16,270	68,467	2,676
1984 ^c	12,000		4,545
1985 ^c	10,500		2,542
1986 ^c	7,436		
1991			4,814 ^d
1992			4,395 ^d
1993			4,275 ^d
1995			5,762 ^d
1996			5,031 ^d
1997			4,763 ^d
1998			3,872 ^d

^a Sarrio and Kessel 1966

^b Foote and Williamson 1966

^c Data from Sport Fish Division surveys.

^d Data from ADF&G Subsistence Division household surveys Georgette and Utermohle 1998.

Table 21.—Historic Dolly Varden harvests and catches in NWMA by sub-area, 1977-2000.

Year	Seward Peninsula/Norton Sound					Kotzebue/Chukchi Sea				
	Number of Anglers	Effort Angler Days	Dolly Varden Harvest	Dolly Varden Catch	% Harvested	Number of Anglers	Effort Angler Days	Dolly Varden Harvest	Dolly Varden Catch	% Harvested
1977		7,828	1,621				3,487	469		
1978		8,379	1,690				4,997	199		
1979		8,725					2,593	1,772		
1980		7,958	5,811				3,841	301		
1981		10,879	3,981				5,284	1,177		
1982		13,198	6,498				6,906	1,531		
1983		16,944	9,779				7,963	2,192		
1984	1,597	17,436	4,260			696	7,791	3,804		
1985	2,854	19,919	5,695			1,788	6,701	1,557		
1986	2,872	18,107	5,381			1,570	6,313	1,300		
1987	2,528	20,413	5,506			2,090	9,288	1,072		
1988	2,661	20,278	4,437			959	5,279	983		
1989	2,560	17,692	7,003			1,028	4,932	999		
1990	2,686	21,799	3,765	9,118	41	991	3,782	806	3,747	22
1991	3,236	23,622	10,365	25,425	41	1,606	9,543	1,149	1,658	69
1992	3,540	22,684	2,382	6,012	40	1,421	6,145	582	7,054	8
1993	3,134	18,930	5,907	22,166	27	1,575	7,809	914	7,190	13
1994	3,016	18,922	3,071	7,344	42	1,100	6,036	2,365	10,733	22
1995	3,719	19,647	2,908	7,921	37	1,957	8,495	939	7,804	12
1996	2,958	13,783	4,285	8,427	51	1,407	5,571	913	5,376	17
1997	2,773	13,850	4,467	17,988	25	824	3,729	598	7,346	8
1998	3,206	13,616	2,240	5,711	39	1,089	3,801	440	8,606	5
1999	3,124	15,006	6,708	21,428	31	1,313	6,771	796	8,259	10
2000	2,713	18,559	7,952	16,348	49	1,387	7,129	1,599	8,031	20
Avg (90-99)	3,139	18,186	4,610	13,154	37	1,328	6,168	950	6,777	19
Avg (95-99)	3,156	15,180	4,122	12,295	37	1,318	5,673	737	7,478	10

Table 22.—Aerial counts of Dolly Varden spawning in the Noatak River and overwintering in the Wulik and Kivalina rivers, 1968-2000.

Year	Spawners		Nonspawners	
	Noatak River	Wulik River	Kivalina River	
1968		90,286	27,640	
1969		297,257	nd	
1976		68,300	12,600	
1979		55,030	15,744	
1980		113,553	39,692	
1981	7,922	101,826	45,355	
1982	8,275	65,581	10,932	
1984	9,290	30,923	5,474	
1985	11,073	nd	nd	
1986	nd	5,590	5,030	
1988	nd	80,000	nd	
1989	nd	56,384	nd	
1990	7,261	nd	nd	
1991	9,605	126,985	35,275	
1992	nd	135,135	nd	
1993	9,560	144,138	16,534	
1994	nd	66,752	nd	
1995	6,500	128,705	28,870	
1996	12,184	61,005	nd	
1997	nd	95,412	nd	
1998	nd	104,043	nd	
1999	9,636	nd	nd	
2000	nd	92,614	nd	

nd = no data

Alaska is unknown, however, recent surveys suggest that spawner abundance is similar to earlier observations.

Drainages of Kotzebue Sound and the Chukchi Sea are known for the large size of anadromous Dolly Varden available to the sport angler. Since the inception of ADF&G's Trophy Fish Program in 1967, out of 179 qualifying fish in the Dolly Varden/Arctic char category, 108 (60%) have come from the NWMA, and in the past 10 years (1990-1999) 88 out of 96 (92%) have come from northwestern Alaska. In addition, the current Alaska sport fish angling record for Arctic char/Dolly Varden (20 lbs. 12 oz.) is a Dolly Varden taken from the Wulik River in 2000.

During summer, spawning Dolly Varden are targeted in some northwestern Alaskan streams, however, most sport fisheries for char target overwintering populations of Dolly Varden either in the fall as they enter freshwater from the sea, or in the spring as they move toward the sea for feeding. Since overwintering populations are comprised of mixed stocks, potentially from a wide geographic area, harvests in the few rivers with good angler access have been sustainable. In some streams along the Nome road system, if such harvests were directed towards a single stock they would likely not be sustainable. Movements of Norton Sound Dolly Varden are tied to those of salmon, and Dolly Varden are present in streams during late summer to feed on salmon eggs, especially during years of high pink salmon abundance. They are likely to remain in streams during the spring following a large pink salmon run in order to feed on outmigrating fry. The timing of the fall movement of Dolly Varden into Seward Peninsula streams has varied widely over the past 10 years resulting in annual changes in the availability of Dolly Varden to the fall fishery. Consequently, fisheries and harvests in this area follow these patterns of availability. In 1988, the BOF adopted the bag limit of 10 Dolly Varden/Arctic char per day with 10 in possession with exceptions for the Noatak, Wulik, and Kivalina rivers where only 2 of the 10 fish could be over 20 inches in length. In 1994, the BOF adopted the current daily bag and possession limits for char in the AYK region with 10 fish per day, only 2 over 20 inches allowed in marine or flowing waters; and 2 fish per day allowed in lakes. Due to habitat preferences, these regulations allow a liberal limit for Dolly Varden while protecting spawning fish, and a conservative limit for Arctic char without the need for anglers to differentiate between the two species.

Recent Fishery Performance

In the Kotzebue/Chukchi Sea sub-area, sport harvests have averaged about 1,000 Dolly Varden annually. Estimated mean annual catch (which includes fish that are kept and those released) since 1990 has been 12,000 Dolly Varden in the Seward Peninsula/Norton Sound area, and 6,000 in the Kotzebue/Chukchi Sea area (Table 21). The data suggest that about 64% of all Dolly Varden captured in the Seward Peninsula/Norton Sound area are released while about 87% in the Kotzebue area are released. The higher harvest rate in the Seward Peninsula/Norton Sound area is likely because local residents have good road access to fishing areas where fish taken on rod and reel are used for food. In the Kotzebue area, fishing sites are accessed by air and much of the effort is from outside the local area by anglers seeking a quality fishing experience. While effort levels in both the Seward Peninsula/Norton Sound area and the Kotzebue area were lower in 1997 and 1998, effort increased in 1999. Catches of Dolly Varden in the Seward Peninsula/Norton Sound sub-area increased dramatically from 5,700 in 1998 to 21,000 in 1999 while they remained stable in the Kotzebue/Chukchi Sea sub-area. The catch of Dolly Varden per angler day has averaged much higher in the Kotzebue area than in the Seward Peninsula area. This is likely because much of the effort on the Seward Peninsula is directed at other species,

while most of the Kotzebue area effort is directed at Dolly Varden. The Kotzebue area seems to be attracting more visiting anglers seeking to catch large northern form Dolly Varden.

Dolly Varden harvests in the Seward Peninsula/Norton Sound sub-area are distributed among most of the sampled rivers with highest harvests coming from the Nome, Unalakleet, Solomon and Fish/Niukluk rivers (Table 23). In the Kotzebue/Chukchi Sea sub-area, highest harvests are from the Noatak and the “other rivers” category that includes the Wulik and Kivalina rivers.

Wulik River

The Wulik River is located about 90 miles north of Kotzebue and is well known as a “char” fishing destination (Figure 7). The river is about 90 miles long and enters the Chukchi Sea through Kivalina Lagoon near the village of Kivalina. The river is heavily used by the residents of Kivalina for subsistence and the majority of the village harvest of Dolly Varden comes from the Wulik River (Table 21). During the most recent five-year period (1994-1998), estimated sport fishing effort has averaged about 500 angler-days (Howe et al. 1995-2000). Sport fishing occurs throughout the open water period, but the majority of effort and harvest occurs during late August and September when Dolly Varden return from the sea to winter in the river.

The average harvest of Dolly Varden from the Wulik River (1995-2000) was 248 fish. The estimated sport harvest during 2000 was 349 fish (Walker et al. *In press*) with the 2000 catch estimated at 2,355 Dolly Varden. Approximately 88% of the catch was of fish greater than 20 inches in length. Effort on the Wulik River more than doubled between 1998 and 1999 to almost 750 angler days, but dropped to 336 angler days in 2000. All are within the historical range of effort reported for the river. Although the river is well known for its large run of anadromous Dolly Varden, effort remains relatively low because of the river’s remote location and difficulty of access.

Fishery Objectives and Management

Management of Dolly Varden in Norton Sound streams is structured to maintain opportunity and allow a relatively liberal bag on mixed stock aggregations. In the Kotzebue sub-area, the intent is to maintain a high quality fishery with the opportunity to harvest a small number of large sized char under a conservative bag that protects the spawning component of the population, minimizes conflicts with subsistence users, and does not adversely affect the population structure. Because of the differential size structure of the population groups north and south of the Bering Strait, these objectives can be addressed with the same general bag and possession limit regulation of 10 fish per day with only 2 over 20 inches in length.

Fishery Outlook

Dolly Varden in Norton Sound are widespread, they spawn in most rivers and overwinter in all major drainages. The outlook is for fisheries to continue into the future without further management actions unless the participation in the fisheries changes dramatically. In the Kotzebue area, the fishery is likely to grow in popularity as more anglers experience these high quality-fishing opportunities. Until these fisheries grow to the point that harvests are thought to affect spawner abundance, spawner success, or population structure, it is unlikely that additional management actions will be necessary.

Recent Board of Fisheries and Management Actions

Population assessments conducted on the Nome and Solomon rivers in 1991 and 1992 suggested that the number of fish overwintering in these drainages could not sustain harvest levels occurring at that time. Consequently, the daily bag limit was reduced by EO to 2 fish.

Table 23.—Historic Dolly Varden and Arctic char harvests in the NWMA by sub-area and river, 1987-2000.

Areas	Year														Average	
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	(90-99)	(95-99)
<u>Seward Peninsula/Norton Sound Historic Dolly Varden and Arctic Char Harvests</u>																
Salt Water	0	418	55	183	0	204	205	90	0	12	189	0	330	1,069	121	106
Nome River		2,001	3,551	1,078	1,220	557	917	431	462	873	328	302	791	340	696	551
Pilgrim River		327	603	166	856	131	448	63	74	388	65	14	45	0	225	117
Unalakleet R.		891	570	614	1,474	746	427	410	976	1,506	936	588	2,384	4,462	1,006	1,278
Fish-Niukluk R.		0	734	348	1,474	270	1,003	699	346	402	2,071	160	1,952	1,687	873	986
Sinuk R.					729	139	536	305	158	485	346	311	88	59	344	278
Snake R.					1,252	115	331	117	131	97	81	0	44	199	241	71
Solomon R.					2,219	131	893	197	366	49	186	383	154	0	509	228
Other Streams	5,506	1,218	1,545	1,227	1,141	89	1,050	759	395	473	265	482	920	136	680	507
Lakes ^a		0	0	332	0	0	97	0	0	0	0	0	0	0	43	0
Freshwater Total	5,506	4,437	7,003	3,765	10,365	2,178	5,702	2,981	2,908	4,273	4,278	2,240	6,378	6,883	4,507	4,015
Grand Total	5,506	4,855	7,058	3,948	10,365	2,382	5,907	3,071	2,908	4,285	4,467	2,240	6,708	7,952	4,628	4,122
<u>Kotzebue/Chukchi Sea Historic Dolly Varden and Arctic Char Harvests</u>																
Salt Water	148	0	0	0	199	0	0	27	22	0	28	0	0	281	28	10
Kobuk R.	127		23	34	170	99	9	132	28	172	82	49	49	47	82	76
Noatak R.	844		651	386	936	197	325	786	124	632	139	175	255	763	396	265
Other Streams	401	965	302	302	412	279	533	1,402	676	97	347	216	181	467	445	303
Lakes ^a	0	18	23	471	0	107	47	18	0	12	0	0	22	41	68	7
Freshwater Total	1,372	983	999	1,193	1,518	682	914	2,338	828	913	568	440	507	1,318	990	651
Grand Total	1,520	983	999	1,193	1,717	682	914	2,365	850	913	596	440	507	1,599	1,018	661

^a Lake totals are for Arctic char

Subsequent studies showed that these populations were comprised of mixed stocks and that at least 20% of the fish overwintering in a given river could be expected to overwinter in a different river the next year. Tag recoveries showed that fish ranged over a wide geographic area. Since exploitation occurs primarily on mixed stocks in only a few locations and many of the represented stocks sustain no other exploitation, harvest levels were thought to be sustainable. Long-term harvest data supported this assumption and the reduced bag limit was rescinded. In the November 1994 meeting, the BOF adopted regulations that created a 10 fish with only 2 over 20 inches daily bag and possession limit for Dolly Varden/Arctic char in flowing and marine waters for the entire AYK Region. A separate daily bag limit of 2 fish (no size limit) was also created for lakes. The effects of these new bag limits are to have a fairly liberal limit for resident and migratory Dolly Varden that protects spawning sized fish, while maintaining a conservative limit for lake resident Arctic char without requiring anglers to differentiate between the two species. This bag limit has not needed to be adjusted, and no recent EOs have been issued regarding char in NWMA.

Current Issues

With over 100,000 anadromous Dolly Varden overwintering annually, the Wulik River is probably the most important Dolly Varden stream in northwestern Alaska (Table 22). Fish from this river are also very important as a subsistence food to the residents of Kivalina who harvest 15,000 to 20,000 annually (Table 20). The Red Dog Mine is located in the headwaters of this drainage and poses a potential threat to these fish and the water quality of the river. Water quality near the mine is systematically monitored and except for a pollution event in 1989-1990, the mine has operated in an environmentally sensitive manner. The Red Dog Mine funds a program run by the Division of Habitat to monitor heavy metals concentrations in receiving waters and in fish tissues. Fish tissues are sampled for heavy metals in the spring and the fall each year on a continuing basis in cooperation with the Division of Habitat. The recent discovery of additional new ore bodies will add new challenges to mineral development in this important drainage.

The question of how great an impact Dolly Varden have on salmon, especially chum salmon populations that have been depressed in Norton Sound for several years, has been raised by Nome residents in a number of public meetings. The department has no data concerning the possible effects of Dolly Varden egg predation on salmon numbers, however there has been no detectable increase in Dolly Varden numbers in Norton Sound to account for increased predation activity, and Dolly Varden have not been found to be significant predators on chum salmon in published predation studies.

Ongoing Research and Management Activities

The ADF&G began an effort to assess Dolly Varden populations in waters of the Seward Peninsula in 1991. Abundances and size compositions have been estimated for Dolly Varden overwintering in the Nome River in 1991 and 1992, and in the Solomon River in 1991. In addition, the movement of marked fish from the Nome River in 1991 to other rivers in 1992 was estimated (DeCicco 1992a, 1993a). These data in combination with harvest estimates and observed changes in abundances have been used to guide ADF&G management activities. It has been learned that Dolly Varden that overwinter in a particular stream may overwinter in other streams during subsequent years. Hence, a restrictive bag limit in one stream does not necessarily protect a single stock because fish range widely and stocks mix over a broad geographic area. Periodic assessment of Dolly Varden populations will continue as needed.

During the winter of 2000/2001 Dolly Varden were radio tagged in the Nome and Solomon rivers in order to document the critical wintering areas in these rivers (DeCicco 2001).

Studies in the Kotzebue area have continued intermittently since 1967, but in recent years have been limited to counting spawning Dolly Varden in Noatak River tributary streams with the assistance of the National Park Service (NPS), and counting Dolly Varden overwintering in the Wulik River with the assistance of the Habitat Division of ADF&G. Data on the abundance of Dolly Varden spawning in the Noatak River system and overwintering in the Wulik River will continue to be collected in cooperation with the NPS and the Habitat Division. A genetics study funded through the USFWS Office of Subsistence Management to determine the relationships among stocks north and south of the Bering Strait has begun, and a detailed study of a single spawning stock in the Noatak drainage was begun in 2001.

NORTHWESTERN ALASKA ARCTIC GRAYLING

Fishery Description and Historical Perspective

Arctic grayling are the most numerous species harvested in the Kotzebue/Chukchi Sea sub-area and the third or fourth most commonly harvested species in the Seward Peninsula/Norton Sound sub-area. In general, the sport fisheries for grayling in the northwestern area are small with average estimated annual harvests of 1,100 in the Seward Peninsula/Norton Sound sub-area and 1,600 in the Kotzebue/Chukchi Sea sub-area (Tables 24 and 25).

The Seward Peninsula has long been known for its production of large Arctic grayling with approximately 25% of all trophy grayling registered with the department's trophy fish program coming from this area. However, most populations are quite small and since they are resident in separate, often small streams, they must be managed as independent units with regulations tailored to the individual populations or groups of similarly structured populations.

Since 1989, the stock status of grayling populations in several rivers where sport fishing occurs on the Seward Peninsula has been investigated (DeCicco 1990, 1991, 1992b, 1993b, 1994-1999 and 2002; DeCicco and Wallendorf 2000). The Nome River stock was found to be overexploited, while the Niukluk, Fish, Pilgrim, Snake and Sinuk rivers populations are believed to be sustaining current levels of harvest. The Solomon River was found to have a very small Arctic grayling population.

Grayling densities in most Seward Peninsula rivers are low. They ranged from about 40 to 60 grayling per mile in the Nome and Sinuk rivers, to about 200 grayling per mile in the Pilgrim River. Densities in the Niukluk and Fish rivers were higher at about 375 and 185 grayling per mile respectively in 1991. More recent data have shown density in the Niukluk River had increased to about 470 grayling per mile in 1998 while density in the Fish River was estimated at about 500 grayling per mile in 1999. In contrast, interior Alaskan populations often exceed 500 fish per mile. Average size of grayling from Seward Peninsula rivers is generally large and they are generally older and larger when they first spawn than grayling in interior Alaska streams. Since they can live for more than 20 years, a grayling from the Eldorado River was recently aged at 31 years. Some grayling survive to grow very large, particularly in rivers where fishing effort is light. For example in the lightly exploited Sinuk River almost 70% of the 1991 sample was age-8 or older and the average total length of all fish sampled was almost 19 inches. However, the density of fish was low, approaching that of the Nome River, which has been the most heavily fished stream in the area and has a depressed grayling population.

Table 24.—Historic Arctic grayling harvests and catches in Seward Peninsula/Norton sound waters, 1987-2000.

Areas	Year														Average	
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	(90-99)	(95-99)
Harvests																
Salt Water	0	55	0	0	0	0	0	131	0	0	0	0	0	0	13	0
Nome River		891	2,032	33	186	0	0	16	0	0	0	0	0	0	24	0
Pilgrim River		109	516	415	445	91	75	49	52	73	81	0	11	58	129	43
Unalakleet R			142	99	1,708	98	131	353	291	420	210	144	277	538	373	268
Fish-Niukluk R.		1,237	748	415	1,320	128	585	506	404	313	734	16	1,029	442	545	499
Sinuk R.					129	0	37	8	18	97	0	8	11	0	34	27
Snake R.					402	16	467	32	18	121	0	8	113	16	131	52
Solomon R.					158	0	0	0	0	0	0	0	0	0	18	0
Other Streams	4,600	2,636	767	416	773	159	289	236	254	461	236	122	159	149	311	246
Lakes		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Freshwater Total	4,600	4,873	4,205	1,378	5,121	492	1,584	1,200	1,037	1,485	1,261	298	1,600	1,203	1,546	1,136
Grand Total	4,600	4,928	4,205	1,378	5,121	492	1,584	1,331	1,037	1,485	1,261	298	1,600	1,203	1,559	1,136
Catches																
Salt Water				0	0	0	0	0	0	0	0	0	0	0	0	0
Nome River				613	1,363	90	569	1,111	571	497	569	207	300	10	589	429
Pilgrim River				1,476	4,463	526	2,362	266	370	821	429	65	694	221	1,147	476
Unalakleet R				448	4,104	1,459	874	1,639	1,471	1,694	4,918	3,256	6,089	6,814	2,595	3,486
Fish-Niukluk R.				2,189	7,261	2,171	5,976	2,389	1,169	4,653	10,452	8,159	7,414	1,701	5,183	6,369
Sinuk R.				232	1,291	300	879	417	498	339	1,464	25	22	29	547	470
Snake R.				199	2,096	158	1,614	377	887	1,055	123	218	723	449	745	601
Solomon R.				33	602	38	140	212	200	97	703	0	21	853	205	204
Other Streams				929	1,980	1,030	809	670	622	1,250	1,529	1,570	869	992	1,126	1,168
Lakes				0	0	0	0	0	0	0	0	0	0	0	0	0
Freshwater Total				6,119	23,160	5,772	13,223	7,081	5,788	10,406	20,187	13,500	16,133	11,069	12,137	13,203
Grand Total				6,119	23,160	5,772	13,223	7,081	5,788	10,406	20,187	13,500	16,133	11,069	12,137	13,203

Table 25.—Historic Arctic grayling harvests and catches in the Kotzebue Sound/Chukchi Sea sub-area, 1989-2000.

Area	Year												Average	
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	(90-99)	95-99)
<u>Harvests</u>														
Salt Water	0	0	0	0	0	10	0	0	0	0	0	0	1	0
Kobuk R.	268	67	446	255	305	178	383	513	476	1,729	672	836	502	755
Noatak R.	912	269	817	105	322	407	185	1,136	872	42	412	223	457	529
Other Streams	150	286	631	248	234	186	263	393	555	0	97	45	289	262
Lakes	85	0	87	360	55	33	79	94	0	17	66	129	79	51
Freshwater Total	1,415	622	1,981	968	916	804	910	2,136	1,903	1,788	1,247	1,233	1,328	1,597
Grand Total	1,415	622	1,981	968	916	814	910	2,136	1,903	1,788	1,247	1,233	1,329	1,597
<u>Catches</u>														
Salt Water		0	0	0	0	10	0	0	0	0	0	0	1	0
Kobuk R.		790	1,535	1,593	1,717	1,593	5,146	2,469	2,815	5,280	6,680	5,753	2,962	4,478
Noatak R.		1,462	2,402	1,112	1,718	842	1,114	3,886	2,179	964	3,621	1,668	1,930	2,353
Other Streams		1,076	1,264	738	3,151	2,653	7,921	3,516	3,182	548	5,114	1,934	2,916	4,056
Lakes		0	174	1,548	642	374	1,560	1,306	216	404	66	376	629	710
Freshwater Total		3,328	5,375	4,991	7,228	5,462	15,741	11,177	8,392	7,196	15,481	9,731	8,437	11,597
Grand Total		3,328	5,375	4,991	7,228	5,472	15,741	11,177	8,392	7,196	15,481	9,731	8,438	11,597

Populations of grayling in the Kotzebue area are inaccessible by road and are lightly exploited. Grayling occur in almost all streams of the area, and in many of the lakes as well. Most grayling in this area are captured in association with wilderness float trips or as an alternate species in trips directed toward fishing for Dolly Varden or sheefish. Over the past five years the estimated harvest rates have been about 14% of those captured (Table 25).

Prior to 1988, the daily bag limit for Arctic grayling in the NWMA was 15 with only 2 over 20 inches. In 1988, the BOF established a separate daily bag and possession limit for Arctic grayling in Northern Norton Sound of 5 per day, with only one over 15 inches. The effect of this change is reflected in harvest estimates that averaged about 4,300 grayling annually from 1980-1988, but dropped to about 1,550 from 1990-2000. Measurable increases in populations in the Fish and Niukluk rivers were likely due to this regulatory change. Both populations nearly doubled in abundance when compared to abundance estimates from the early 1990s.

Recent Fishery Performance

Seward Peninsula/Norton Sound Sub-area

Estimated harvests of Arctic grayling by sport anglers in the Seward Peninsula/Norton Sound area have been declining since a high of 5,121 reached in 1991. Since then, harvests have averaged about 1,100 per year (Table 24). Estimated harvests have recently trended downward, from about 1,600 in 1993 to about 1,256 in 1997 and 298 in 1998. The harvest increased to 1,600 Arctic grayling in 1999 and was estimated at 1,203 in 2000. The estimated catch of Arctic grayling tripled from 6,342 in 1996 to 20,117 in 1997, dropping in 1998 to 12,408 fish and rebounding to 16,000 in 1999. It was estimated at 11,000 in 2000. It appears that catch and release practices are increasing in these grayling fisheries. The percentage of captured grayling that were harvested averaged about 17% from 1993 through 1996 and dropped to about 6% in 1997 and 2.4% during 1998. However, this increased to about 10% in 1999 and 2000.

Current exploitation rates on most northwestern Alaska grayling populations are unknown, but since most are in remote areas, exploitation is believed to be light. Some estimates of exploitation in Nome area roadside streams are available by combining harvest data with abundance data. Using these data for years with abundance estimates, exploitation rates of Arctic grayling have been estimated to range from 10 to 20% in some streams during the early 1990s. More recent estimates for the Niukluk and Fish rivers suggest that exploitation in these streams is nearer 1%. These data suggest a change in angler motivation toward enjoyment of a quality fishing experience, away from harvest as a primary reason for fishing.

Kotzebue Sub-area

In the Kotzebue/Chukchi Sea sub-area, harvests over the past five years have ranged between 900 and 2,100 fish (Howe et al. 1996, 2000a-d). Catches over the same period have ranged quite widely from about 16,000 in 1995 to about 7,200 in 1998. The percentage of catch harvested has ranged from about 37% in 1992 to 6% in 1995. It has been about 8% in 1999 and 13% in 2000. Most grayling from this area are harvested in association with float trips or for variety, while fishing for other species. It is likely that harvests will remain relatively stable until participation in this area increases significantly.

Fishery Objectives and Management

Research on the status of resident Arctic grayling populations in the rivers accessible by the road system in northern Norton Sound has been ongoing for about 12 years. Arctic grayling in northwestern Alaska may live for more than 20 years and attain a large size. They spawn in the

spring and the summer is spent feeding to recover condition in order to be able to spawn the next year. Data on population abundance, age, and size composition by river throughout this period has allowed the development of regulations tailored to individual rivers or groups of rivers that share population characteristics. Overall management objectives for these Arctic grayling populations are to maintain the historic abundance, and size compositions, and to allow for population recovery in systems that have been stressed by over exploitation. Maintaining the opportunity to participate in high quality Arctic grayling fisheries is also an objective of management. The background daily bag and possession limits are 5 fish per day with only 1 over 15 inches. This bag limit is appropriate for drainages with Arctic grayling populations that have characteristics of lightly exploited populations. These characteristics include large average size and a high proportion of sexually mature fish that are seven years of age or older in the population. Abundance is related more to the river's size and flow characteristics, therefore, both abundance and population density varies by river. Rivers that share these characteristics and regulations include the Fish/Niukluk River system, the Eldorado, Kuzitrin and Sinuk rivers. On the other extreme are over exploited populations where abundance is very low. Rivers like the Nome and Solomon are in this category. These rivers are closed to fishing for Arctic grayling. Populations intermediate between these two categories include those in the Pilgrim and Snake rivers. These populations contain a smaller proportion of sexually mature fish, have been impacted somewhat by harvest, but Arctic grayling are still relatively abundant. In these rivers the regulations allow harvest of 2 Arctic grayling per day with only 1 over 15 inches.

Management objectives have not been developed for remote Arctic grayling waters for the remainder of the Seward Peninsula or the Kotzebue sub-area. Such waters are rarely visited by anglers, and populations are in pristine condition. The general regulations for these waters provide for a liberal daily bag and possession limit of 10 fish with no size limits. Until effort and harvests increase, it is likely that regulations will remain unchanged. A statewide Arctic grayling management plan is being developed by the department.

Fishery Outlook

Northwestern Alaska, particularly Seward Peninsula waters provide some of the best opportunities in the state to capture large sized Arctic grayling. Many populations are dominated by large sexually mature fish. Populations are managed to maintain this size structure by limiting the harvest of large fish. The result is a quality Arctic grayling fishing opportunity. The outlook for these fisheries to be maintained is favorable. Populations in the Fish and Niukluk rivers have recovered from relatively low levels of abundance in the early 1990s, and the outlook in these rivers is exceptional.

Recent Board of Fisheries and Management Actions

In 1992 the daily bag and possession limit for Arctic grayling in the Pilgrim River was reduced to 2 per day with only 1 over 15 inches, and the Nome and Solomon rivers were closed to fishing for Arctic grayling by EO. In 1993, the daily bag and possession limit in the Snake River was made the same as that in the Pilgrim River. In the 1994 meeting, the BOF adopted these bag limit changes for the Snake and Pilgrim rivers into regulation. After a population assessment in the Nome River in 1997 found that the population had not increased after five years of emergency closure, the BOF adopted regulations closing the Nome and Solomon rivers to fishing for Arctic grayling. In 2000 the BOF also closed these rivers to subsistence fishing for Arctic grayling.

Current Issues

There is concern on the part of the public and ADF&G staff that populations of grayling in the vicinity of Nome that are road accessible, especially the Nome and Solomon rivers, have been over harvested and may not recover for many years. The Nome River population showed no increase over the past five years. An experimental restoration project in 1998 to increase survival of young-of-the-year Arctic grayling by rearing them in a gravel pit failed. Additional restoration efforts are underway using a different rearing pond. Other road accessible populations would be vulnerable to over exploitation if fishing practices and motivations were to change, however, at this time other populations appear to be healthy, and able to sustain the current low levels of harvest. The Nome and Solomon rivers have been closed to sport fishing for Arctic grayling since 1992. In 1999, these rivers were closed to the subsistence fishing for Arctic grayling by EO, and they were closed by the BOF in 2000.

Ongoing Research and Management Activities

The ADF&G began an ongoing active effort to assess Arctic grayling populations in waters of the Seward Peninsula in 1989. Abundance and age and size compositions have been estimated for Arctic grayling in the Fish, Niukluk, Nome, Pilgrim, Snake and Sinuk rivers. These data in combination with harvest estimates and observed changes in abundance or size or age compositions have been used to guide ADF&G management activities. Special regulations in some streams and the closure of both the Solomon and Nome rivers to grayling have resulted. Assessments of the Nome River grayling population in 1997 and 2000 found that it had not recovered even with years of closure to sport fishing. This project has shown the need to close these rivers to all harvest of Arctic grayling. Stock assessment in the Fish and Niukluk rivers in 1998 and 1999 found that grayling populations had increased significantly since the early 1990s. These changes are likely a delayed effect of regulation changes made in 1988. A management plan is being developed that addressed Nome roadside Arctic grayling fisheries.

KOTZEBUE SOUND SHEEFISH

Fishery Description and Historical Perspective

Within the NWMA, except for a small population of sheefish that resides in the Koyuk River of Norton Bay, spawning stocks of sheefish occur only in the Kobuk and Selawik rivers (Alt 1975).

The drainages of Kotzebue Sound are known for the large size of sheefish that are available to the sport angler. These remote high quality sport fisheries are considered by many to be some of the "crown jewels" of Alaskan freshwater sport fishing. Since the inception of ADF&G's Trophy Fish Program in 1967, all but one of the qualifying sheefish has come from the Kobuk River.

Kotzebue Sound sheefish are distributed throughout the nearshore estuarine areas of Kotzebue Sound. The major concentration is in Hotham Inlet but a few fish occur in the Sheshalik and Krusenstern areas as well as in southern Kotzebue Sound, especially in summer (Figure 13). Nearly all sheefish occupying the estuarine environment during summer are immature or nonspawning adults, while adult prespawning fish move upstream on the Kobuk and Selawik rivers to spawn just before freeze-up in the fall. The Kobuk River stock with 32,000 to 43,000 spawning in 1995-1996 (Taube 1997, Taube and Wuttig 1998) is the largest and most heavily utilized. They spawn upstream from the village of Kobuk, with the greatest observed concentrations between the Maneluk River and Beaver River. After spawning is complete in late September, fish disperse to downstream overwintering areas. Abundance of sheefish spawning

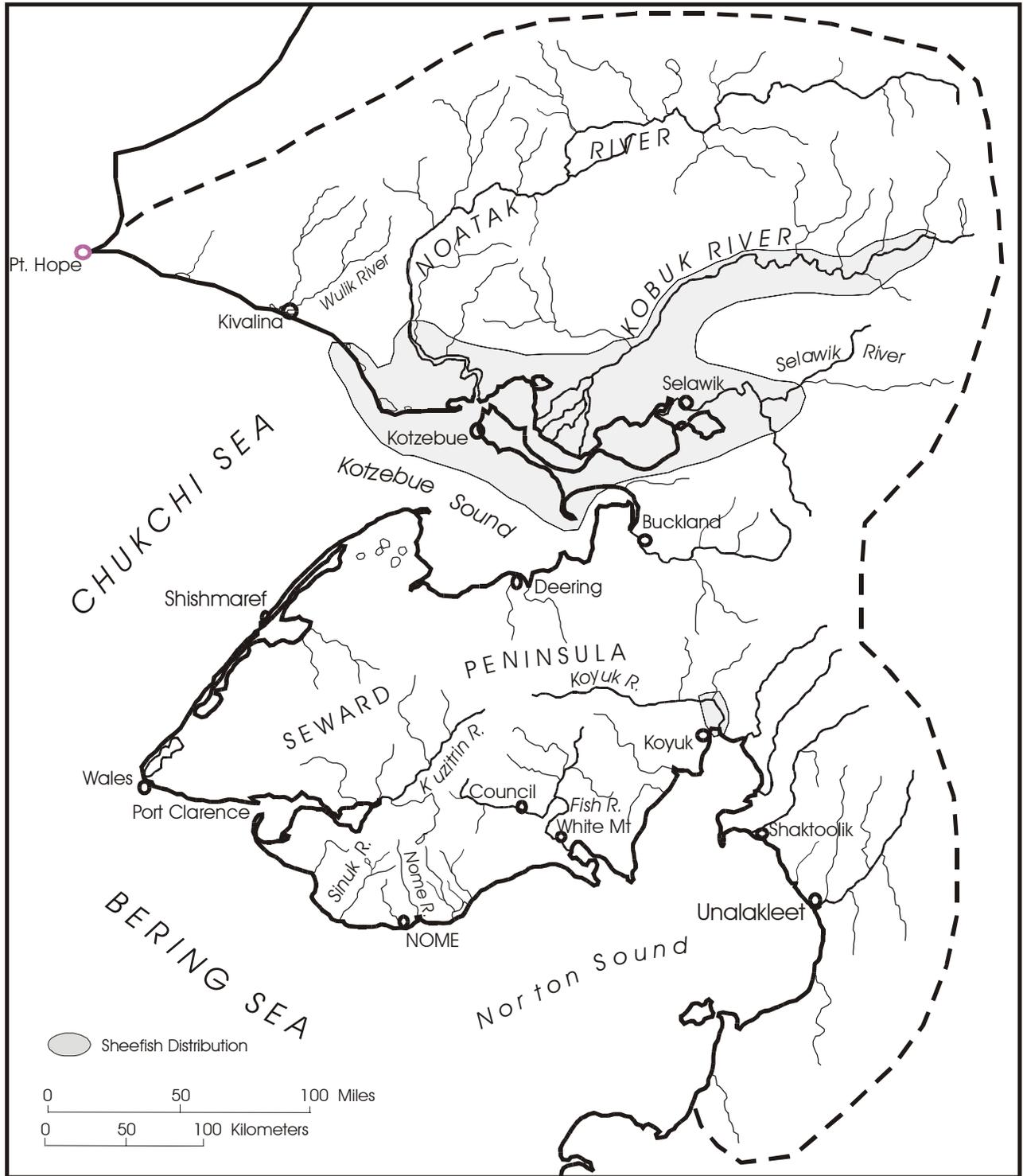


Figure 13.-Sheefish distribution in the NWMA.

in the Selawik River was estimated at about 5,200 fish during 1995 and 1996 (Underwood et al. 1998). Tag recoveries showed that these stocks mixed in Hotham Inlet winter habitats, but maintained fidelity to their spawning areas.

Sport fisheries for sheefish are managed by the Sport Fish Division of ADF&G. Subsistence fisheries are given priority. The commercial fishery and much of the subsistence harvest takes place through the ice while sport fisheries are mainly summer and fall activities. The same population(s) contributes to all harvests. The annual commercial sales of sheefish in Kotzebue have ranged from 200 to 850 fish since 1991 (Brennan et al. 1998, 1999). The magnitude of the subsistence harvest in the villages of the Kobuk River was estimated at about 7,000 in 1996 (Georgette and Utermohle 1997), 9,800 in 1997, 5,350 in 1998 and 8,526 in 1999. In 2000, 7,446 were estimated to have been harvested (Table 26). Since subsistence practices have not changed appreciably in recent years, it is likely that Kobuk River subsistence harvests have been relatively stable at, or near, these levels. Winter gill net harvests from the fishery near Kotzebue were estimated at about 15,000 in 1995- 1996, and about 14,000 in 1996-1997 (Taube 1997, Taube and Wuttig 1998). During the winter of 2000-2001, a complete census of participants in the winter fishery documented the harvest at 14,533 (Savereide *In press*). Sheefish are also taken by jigging lures under the ice in Hotham Inlet and Selawik Lake, but harvests are undocumented.

The Sport Fish Division of ADF&G conducted studies of the ecology, movements, and growth of sheefish between 1966 and 1979. Much of this work was conducted in northwestern Alaska and was summarized by Alt (1987). After some familiarization work in 1994, ADF&G Division of Sport Fish in cooperation with the National Park Service (NPS), began a project to estimate abundance of sheefish spawning in the Kobuk River. This project continued through 1997 and established base line estimates on spawner abundance, age, size and sex composition of the spawning population. Tag recovery data indicated that, although some sheefish were capable of spawning in consecutive years, most spawned every other year. The abundance of sheefish spawning in the Selawik River was estimated at 5,200 and 5,150 in 1995 and 1996 by the U. S. Fish and Wildlife Service (Underwood et al. 1998).

Most sheefish sport fishing effort occurs on the Kobuk River spawning population. Most of the area-wide subsistence harvest and the entire commercial harvest of sheefish occur on the entire (spawners and nonspawners) population. When taken in isolation, recent sport harvests of about 800 fish annually are easily sustainable. Although spawner abundances have recently been estimated, the total size of the area wide population is not known, and the sport harvest must be viewed in relation to other ongoing harvests. It was always assumed that subsistence harvests are much greater than either commercial or sport harvests, and recent data support this assumption. Taube and Wuttig (1998) estimated the under ice gill net harvest in Hotham Inlet near Kotzebue at 13,704 fish in the winter of 1997-1998. In order to ensure sustained yields from these population(s), a management approach involving the subsistence and commercial fisheries for sheefish is recommended. Sheefish are very fecund fish with some large females containing over 400,000 eggs. Such populations may be subject to episodic recruitment events depending on environmental conditions. If spawner abundances are maintained above some threshold level, intermittent years of good recruitment should carry the population through years when environmental conditions are less favorable.

Table 26.—Reported subsistence sheefish harvests, Kotzebue District, 1966-2000^a.

Year	Number of Fishermen Interviewed	Reported Harvest	Average Catch Per Fisherman	Hotham Inlet Winter Harvest
1966-67	135	22,400	166	
1967-78	146	31,293	214	
1968-69	144	11,872	82	
1970	168	13,928	83	
1971	155	13,583	88	
1972	79	3,832	49	
1973	65	4,883	75	
1974	58	1,062	18	
1975	69	1,637	24	
1976	57	966	17	
1977	95	1,810	19	
1978	95	1,810	19	
1979	75	3,985	53	
1980	74	3,117	42	
1981	62	6,651	107	
5/82-4/83 ^b	430	4,704	36	
5/83-4/84 ^b	27	764	28	
5/84-9/84 ^b	30	2,803	93	
1985 ^c	2	60	30	
1986 ^{b,c}	72	721	10	
1987 ^c	46	276	6	
1988 ^{c,d}				
1989 ^d				
1990 ^d				
1991	40	2,180	55	
1992	43	2,821	66	
1993 ^d				
1994	171	3181 ^e	84	
1995	314	9465 ^e	24.6	15,161 ^f
1996	389	6465 ^e	18	13,704 ^f
1997	338	9805 ^e	24.6	
1998	435	5350 ^e	13.6	
1999	191	8256 ^e	18.6	
2000	237	7446 ^e	16.6	14,533 ^f

^a Due to limited survey effort during many years, total catch and effort are minimums and are not comparable among years. Data from Brennan et al. 1999.

^b Summer harvests only.

^c Data from fall subsistence salmon surveys may include summer and winter harvests.

^d Subsistence sheefish harvests not documented.

^e Reported harvests from Kobuk River villages only.

^f Data from Sport Fish Division harvest estimates.

Recent Fishery Performance

Estimated annual sport harvests of sheefish by anglers in northwestern Alaska since 1977 have fluctuated from a high of about 1,900 to a low of about 145 with an average annual harvest of about 780 fish over the past 10 years (Table 27). The harvest in 2000 was estimated at 1,201 sheefish, and the most recent five year (1995-1999) average harvest has been about 720 sheefish. In addition to harvests, catches have been estimated through the SWHS since 1990. Estimates of sheefish catch (which includes fish that are kept and those released) for the past five years was about 2,500 fish, indicating that about 71% of all sheefish captured in northwestern Alaska by sport anglers are released. In a 1997 hook and release study, the mortality of sheefish caught and released on sport fishing gear was found to be low, 3.3% for treble hook lures, and 1.7% for single hook lures (Stuby and Taube 1998). Overall mortality was 2.4%. Approximately 67% of all sheefish caught on the Kobuk River over the past ten years have been released. The Kobuk River is probably the most popular sheefish destination in North America, and people from the world over come there to fish for this unique species. In spite of the world-wide reputation of this destination, the level of fishing effort is still quite low. An estimated 428 anglers fished for a total of 1,844 angler-days on the Kobuk River during 2000. This was about 25% of the overall freshwater sport fishing effort in the Kotzebue sub-area (7,129 angler-days) in 2000.

Fishery Objectives and Management

The Kobuk River sheefish fishery is managed to maintain opportunity to participate in this unique high-quality sport fishery while keeping harvests from spawning areas low. In order to accommodate local use of this resource downstream from major spawning areas, the daily bag limit is generous downstream from the Mauneluk River (10 sheefish per day). In the spawning area upstream from the Mauneluk River, only two fish per day are allowed to be harvested or in possession. The majority of anglers visiting the Kobuk River for sheefish use the area upstream from the Mauneluk River.

Fishery Outlook

The outlook for sheefish fisheries in northwestern Alaska is good in the immediate future. Although overall harvest levels are substantial, populations appear to be healthy, spawner abundances are high and sport harvests are low.

Recent Board of Fisheries and Management Actions

During 1988, the Board of Fisheries adopted the current regulations for sheefish in the waters of northwestern Alaska: 10 fish per day and 10 in possession, with an exception for the Kobuk River upstream of the Mauneluk River where only 2 sheefish may be caught per day or possessed. The ADF&G believes that these regulations are sufficient to allow ample opportunity for sport fishing, yet keeping harvests low. The 10 fish limit in the lower Kobuk River and the remainder of the management area is liberal enough to allow local fishermen who choose to catch sheefish on sport fishing tackle the opportunity to take sheefish without the need to fish with nets. During the December 2000 meeting, the BOF reduced the sheefish daily bag and possession limit in spawning areas on the Selawik River to two sheefish. This made regulations on the Selawik River consistent with those already in place on the Kobuk. Another sheefish proposal that would have eliminated catch and release of sheefish was not supported.

Current Issues

Local native residents of Kobuk River villages have expressed concern over some practices of sport anglers on the upper Kobuk River in the vicinity of the sheefish spawning grounds. Catch

Table 27.—Historic sheefish sport fish harvests and catches from northwest Alaska waters, 1977-2000.

Year	Kotzebue/Chukchi Sea Sub-area								
	Sheefish			Kobuk River			Selawik River		
	Harvest	Catch	% Harvested	Harvest	Catch	% Harvested	Harvest	Catch	% Harvested
1977	656								
1978	506								
1979	709								
1980	1,713								
1981	1,263			1,015					
1982	2,222			1,886					
1983	2,079			1,448					
1984	3,050								
1985	1,645			1,330					
1986	3,363			1,590					
1987	1,836			865					
1988	964			964					
1989	629			131					
1990	151	403	37	151	336	44.9	0	0	0
1991	603	1,616	37	579	1,568	36.9	24	48	50.0
1992	1,904	3,678	52	627	2,034	30.8	411	411	100.0
1993	1,029	2,273	45	395	1,074	36.8	111	111	100.0
1994	564	958	59	135	386	35.0	95	95	100.0
1995	1,142	3,270	35	748	2,669	28.0	38	47	80.9
1996	485	3,183	15	360	2,850	12.6	94	271	34.7
1997	906	2,341	39	318	1,334	23.8	108	108	100.0
1998	414	924	45	145	617	23.5	148	186	79.6
1999	635	5,134	12	621	5,070	12.2	nd	nd	nd
2000	1,201	3,372	36	362	2,338	15.5	0	0	0
90-99 Avg	783	2,378	38	408	1,794	28	114	142	72
95-99 Avg	716	2,970	29	438	2,508	20	97	153	74

and release fishing is considered by some local residents to be disrespectful and damaging to the fish. The discarding of filleted carcasses in the water is thought to drive other sheefish away from the area. The ADF&G Division of Subsistence investigated local concerns in the upper Kobuk River in 1986 and determined that some concerns could be addressed if sport fishers were more aware of local customs and culture. Catch and release fishing is viewed as a conservation tool by ADF&G and by many anglers and although sheefish may be sensitive to rough handling, the department has demonstrated that they can be released without significant mortality. An educational brochure explaining proper hook and release techniques for sheefish has been developed in association with the NPS. This brochure has been made available to those fishing on the upper Kobuk River. It is hoped that with proper handling, impacts of catch and release fishing to the spawning population can be minimized.

Because the subsistence component of the harvest is high, and some sheefish spawning areas are located within federally managed lands, the possibility exists that federal subsistence management in these areas may affect sport fishing opportunity there. This issue may be addressed in the future as the USFWS Office of Subsistence Management becomes more involved with active management of fisheries in remote areas of Alaska.

Ongoing Research and Management Activities

The department believes that recent research conducted cooperatively with the USFWS and the NPS has provided substantial background data on spawner abundance for the two stocks comprising the Kobuk-Selawik sheefish population. These data will be used as a base line to which future population assessments can be compared. Additional studies to monitor harvests may be planned. Current low levels of sport fishing harvest are unlikely to affect sustained yields of this species in northwestern Alaska. A study to document the winter subsistence harvest of sheefish in Kotzebue Sound was completed in 2001 (Savereide *In press*). This study was funded through the USFWS Office of Subsistence Management.

NORTHWESTERN ALASKA NORTHERN PIKE

Fishery Description and Historical Perspective

Northern pike are present throughout the northern regions of the world. They are primarily a freshwater resident species, but are known to enter weakly brackish waters in the Baltic and in some other areas. The known distribution of northern pike in northwestern Alaska is shown in Figure 14.

Northern pike occur in most of the lakes and flowing waters of the Noatak and Kobuk rivers and are particularly common in wetlands of the lower reaches, delta areas, and in lakes in lowland areas adjacent to these rivers. Northern pike are also common residents of the waters along the western shores of Hotham Inlet, Selawik Lake and the entire Selawik lowland area. They occur in the lower portions of the Buckland River drainage, and may be present in some lakes and streams on the northern Seward Peninsula. On the remainder of the Seward Peninsula, northern pike are common residents of Imuruk Basin and the middle and lower reaches of the Pilgrim and Kuzitrin rivers. These two adjacent drainages form a large interconnected wetland area (approximately 380 km²) in their lower reaches. In addition there is another large wetland area (approximately 650 km²) farther upstream in the Kuzitrin River drainage. Northern pike are also found in the Fish River drainage and have even been observed in the fast clear waters of the Niukluk River downstream from Council. They occur in the Koyuk River and may be present in

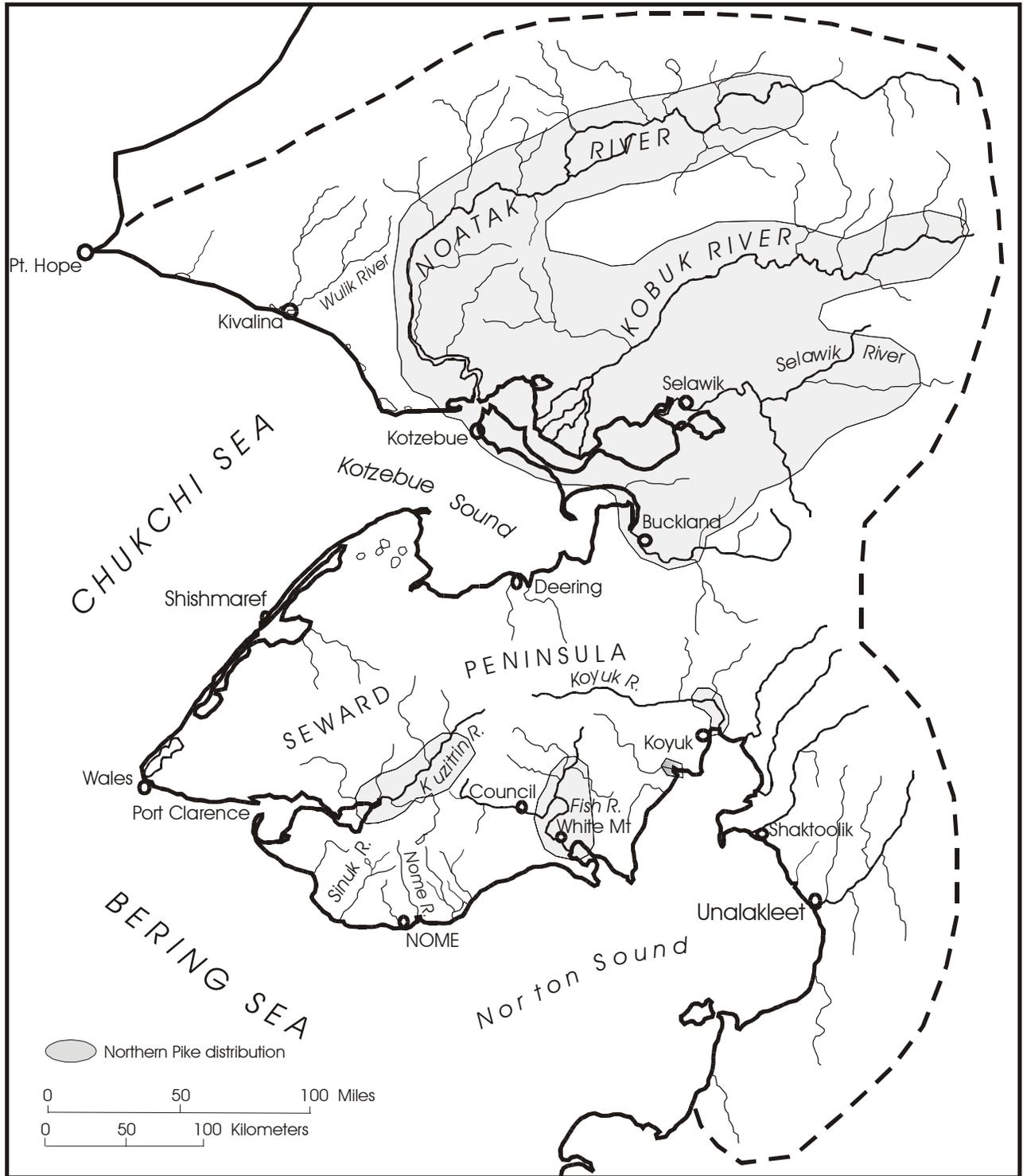


Figure 14.-Northern pike distribution in the NWMA.

the Kwik River near Moses Point, but are not known to be present in other Norton Sound drainages.

The majority of northern pike harvested in northwestern Alaska are taken for subsistence. Few community harvest estimates are available, however, in 1986, 5,750 northern pike were estimated to have been harvested by the community of Kotzebue. During the mid 1980s a commercial freshwater fishery occurred near Selawik. In 1985, the USFWS estimated that the spring subsistence/commercial harvest (only some of the fish were sold) of northern pike was between 5,671 and 9,138 fish. Currently, without the commercial fishery, the annual harvest at Selawik is still likely several thousand northern pike. Northern pike are also harvested by residents of the lower Kobuk River villages of Noorvik and Kiana, and the residents of Teller who fish in Imuruk Basin drainages. Additional harvests of northern pike may take place near other area villages. The total annual northwestern Alaska northern pike subsistence harvest is likely 10,000 to 15,000 fish.

Sport fisheries for northern pike occur around Kotzebue in lakes in the lower Noatak and Kobuk river drainages, but participation and harvests are low. About 195 northern pike were estimated to have been harvested in the Kotzebue sub-area of NWMA during 1998, 193 in 1999, and 357 in 2000 (Table 28). In the Seward Peninsula/Norton Sound sub-area, virtually the entire harvest of northern pike comes from Imuruk Basin drainages, and most of that from the Kuzitrin or lower Pilgrim rivers. During 1997, 363 northern pike were estimated to have been harvested, during 1998 the harvest was estimated at 75 northern pike, 355 were harvested in 1999, and in 2000, 420 northern pike were estimated harvested in this fishery.

Recent Fishery Performance

Estimated harvests of northern pike by sport anglers on the Seward Peninsula have averaged about 650 fish over the past 10-years, with the largest annual harvest estimated at nearly 2,000 in 1990 (Table 28). The average annual harvest for the past five years was 347 fish, and the 2000 estimated harvest was 347 fish. Estimates of catch (which includes fish that are kept and those released) since 1990 indicate that about 78% of all pike caught in the past ten years have been released. It is assumed that anglers are selectively retaining larger sized northern pike. Most of the harvest of pike on the Seward Peninsula takes place in the Pilgrim or Kuzitrin River drainages. During 1992 and 1993 the abundance of northern pike in the lower Pilgrim and Kuzitrin rivers was estimated at about 10,000 fish over 300 mm (12 in) in length for that portion of the population inhabiting these rivers from the road crossings downstream to their confluence (Burkholder 1993, 1994). Northern pike populations have been shown to sustain annual harvests of about 15%. Current exploitation of the Pilgrim-Kuzitrin population appears to be less than 5%, which is well within what are thought to be sustainable levels.

Estimated sport harvests of northern pike in the Noatak-Kobuk-Selawik area of northwestern Alaska have averaged about 279 fish over the last 10-years (Table 28). Estimated harvests reached a high of 2,752 fish in 1986, and a low of 64 fish in 1989. The harvest in 2000 was about 357 fish, the highest harvest since 1993. The average annual harvest for the past five years has also been about 180 fish. Since assessment of northern pike populations has not been carried out in this area of northwestern Alaska, the health of populations and relative influence of harvests can only be inferred by comparing the area to other parts of Alaska. The amount of suitable northern pike habitat in the Noatak-Kobuk-Selawik area is much greater (by approximately 50 times) than that available to northern pike in the Pilgrim-Kuzitrin area, and the

Table 28.—Historic northern pike sport fish harvests and catches in the NWMA by sub-area, 1977-2000.

Year	Seward Peninsula/Norton Sound sub-area					Kotzebue/Chukchi Sea sub-area				
	Number	Effort	Northern Pike		%	Number	Effort	Northern Pike		%
	of	Angler	Harvest	Catch		of	Angler	Harvest	Catch	
	Anglers	Days			Anglers	Days	Harvest			
1977		7,828	302			3,487	147			
1978		8,379	389			4,997	389			
1979		8,725				2,593	527			
1980		7,958	284			3,841	852			
1981		10,879	303			5,284	465			
1982		13,198	210			6,906	454			
1983		16,944	798			7,963	1,262			
1984	1,597	17,436	208			696	7,791	312		
1985	2,854	19,919	56			1,788	6,701	383		
1986	2,872	18,107	699			1,570	6,313	2,752		
1987	2,528	20,413	906			2,090	9,288	813		
1988	2,661	20,278	564			959	5,279	1,565		
1989	2,560	17,692	648			1,028	4,932	64		
1990	2,686	21,799	1,957	4,145	47	991	3,782	320	1,730	18
1991	3,236	23,622	1,429	4,257	34	1,606	9,543	394	1,879	21
1992	3,540	22,684	479	3,742	13	1,421	6,145	333	1,666	20
1993	3,134	18,930	537	2,117	25	1,575	7,809	559	2,209	25
1994	3,016	18,922	376	1,731	22	1,100	6,036	287	1,488	19
1995	3,719	19,647	215	1,856	12	1,957	8,495	256	1,421	18
1996	2,958	13,783	728	3,239	22	1,407	5,571	112	1,423	8
1997	2,773	13,850	363	2,188	17	824	3,729	145	657	22
1998	3,206	13,616	75	452	17	1,089	3,801	195	1,104	18
1999	3,124	15,006	355	2,217	16	1,313	6,771	193	1,869	10
2000	2,713	18,559	420	1,317	32	1,387	7,129	357	1,249	29
Avg (90-99)	3,139	18,186	651	2,594	22	1,328	6,168	279	1,545	18
Avg (95-99)	3,156	15,180	347	1,990	17	1,318	5,673	180	1,295	15

sport harvests are much lower. It is unlikely that sport fisheries are adversely impacting northern pike populations, even when taken in addition to subsistence harvests.

Fishery Management Objectives

There are no specific management objectives for northern pike fisheries in NWMA. Regulations are liberal and management is structured to encourage participation. Liberal regulations provide the opportunity for rural residents to harvest northern pike with rod and reel within the sport fishing regulatory framework. Baseline data exist for the Pilgrim/Kuzitrin portion of the Imuruk Basin population complex. Because of the proximity of Nome, it is likely that this population will be the first in the NWMA to require more restrictive regulations as the human population in the Nome area grows and participation in the fishery increases. Harvests are monitored through the SWHS. If large changes in harvest occur, additional stock assessment work will be conducted.

Fishery Outlook

Changes in fishing regulations for northern pike in the NWMA are not expected in the near future. Pike populations are largely unexploited, and both participation and harvest are low.

Recent Board of Fisheries and Management Actions

There have been no recent BOF or management actions concerning northern pike. The current daily bag and possession limit in the NWMA is 10 fish with no size limit.

Current Issues

There are no current issues regarding northern pike in the NWMA. Harvest level will continue to be monitored through the SWHS. If harvests increase dramatically, additional research may be undertaken.

Ongoing Research Activities

There are no current research activities associated with northern pike in the NWMA.

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APPENDIX A

Appendix A.—National Wild and Scenic Rivers in the NWMA.

- Streams Within The National Park System

Kobuk River. The portion within the Gates of the Arctic National Park and Preserve.

Noatak River. The river from its source in the Gates of the Arctic National Park to its confluence with the Kelly River in the Noatak National Preserve.

Salmon River. The portion within the Kobuk Valley National Park.

- Streams Within The National Wildlife Refuge System

Selawik River. The portion from a fork of the headwaters in township 12N, Range 10E, Kateel River meridian to the confluence of the Kugarak River; within the Selawik National Wildlife Refuge.

- Streams Located Outside National Parks and Refuges

Unalakleet River. The segment of the main stem from the headwaters in township 12S, Range 3W, Kateel River meridian extending downstream approximately 65 miles to the western boundary of township 18S, range 8W.

APPENDIX B

Appendix B.—Northwestern Area sport fishing regulations summary for 2000.

NORTHWESTERN ALASKA

SEASONS

Entire year for all species except halibut. Halibut season is February 1-December 31.

BAG, POSSESSION, AND SIZE LIMITS GENERAL REGULATIONS

The general regulations for all waters of the Northwestern Area are listed below. Special regulations for individual water bodies appear afterward (at bottom of page).

Species	Daily Bag	Possession & Size Limit
King salmon 20 “ or greater	1	
Less than 20 “	10	
Other salmon	10	(no size limit)
Arctic char/Dolly Varden (all lakes)	2	(no size limit)
Flowing and salt water	10	(only 2 over 20 inches)
Lake trout	4	(no size limit)
Arctic grayling	10	(no size limit)
Sheefish	10	(no size limit)
Northern pike	10	(no size limit)
Burbot	15	(no size limit)
Halibut	2 per day	4 in possession, no size limit
Outlet stream (Pilgrim River) 300 feet downstream from - Salmon Lake		Closed to salmon fishing
Shellfish		

-continued-

SPECIAL REGULATIONS

KOBUK RIVER DRAINAGE (upstream of the mouth of the Mauneluk River):

1. Sheefish- daily bag and possession limit is 2 fish, no size limit.

NORTHERN NORTON SOUND (all waters draining into Norton Sound from Cape Darby to Cape Prince of Wales (see map):

1. **Chum salmon:** Daily bag and possession limit is 3 fish, not size limit
All freshwater drainages and marine waters between the west bank of the Sinuk River and Topkok Head (see map) are closed to chum salmon fishing.
2. **Coho salmon:** Daily bag and possession limit is 3 fish, no size limit
3. **Sockeye salmon:** Daily bag and possession limit is 3 fish, not size limit
4. **Pink salmon:** Daily bag and possession limit is 10 fish, no size limit
5. **Arctic grayling:** Daily bag and possession limit is 5 fish, **only 1 over 15 inches**
6. **Salmon Lake, its tributaries, and the lake outlet are:** *Closed to salmon fishing.*
7. **Nome River:** *Closed to fishing for Arctic grayling*
8. **Pilgrim River drainage:** Arctic grayling daily bag and possession limit is 2 fish, **only 1 over 15 inches.**
9. **Snake Rive drainage:** Arctic grayling daily bag and possession limit is 2 fish, **only 1 over 15 inches.**
10. **Solomon River:** *Closed to fishing for Arctic grayling*

UNALAKLEET RIVER DRAINAGE:

- 1: Arctic grayling: Daily bag and possession limit is 5 fish, **only 1 over 15 inches**
- 2: Other salmon: Daily bag and possession limit is 5 fish, no size limit.
After taking a bag limit of coho salmon from the Unalakleet River drainage, a person may not sport fish for any species of fish downstream from the South River for the remainder of that same day.
- 3: All salmon: Any salmon completely removed from the water shall be retained and becomes part of the bag limit of the person originally hooking it. A person may not completely remove a salmon from the water before releasing it.

APPENDIX C
SPORT FISH EMERGENCY ORDERS ISSUED
DURING 2000 AND 2001

Appendix C1.—Sport fish emergency order issued at Nome August 31, 2000.

SPORT FISHING

Emergency Order

**ALASKA DEPARTMENT
OF FISH & GAME**

Under Authority of AS 16.05.060

Emergency Order No. 3-SS-01-00

Issued at Nome, Alaska
3:00 p.m. ADT, August 31, 2000

Effective Date 8:00am ADT
Friday September 1, 2000

Expiration Date: December 31, 2000
unless superseded by subsequent
emergency order.

EXPLANATION:

This emergency order reduces the daily bag and possession limit for coho salmon to one fish in most Nome Subdistrict streams, and in the Pilgrim River, and closes the Eldorado, Flambeau and Solomon Rivers to fishing for coho salmon. Streams affected by this emergency order include the Sinuk, Cripple, Penny, Snake, Nome, bonanza and Pilgrim rivers where the daily bag and possession limit is reduced to one coho salmon; and the Eldorado, Flambeau and Solomon rivers where fishing for coho salmon is closed.

REGULATION:

The provisions of 5AAC 70.022. (b)(7) WATERS; SEASONS; BAG, POSSESSION, AND SIZE LIMITS; AND SPECIAL PROVISIONS are superseded by this emergency order. Under this emergency order the following provisions are effective. Coho salmon fishing in the Eldorado, Flambeau, and Solomon Rivers is closed. In addition, the daily BAG and POSSESSION limit for coho salmon in the Sinuk, Cripple, Penny, Snake, Nome, Bonanza and Pilgrim rivers is reduced to one coho salmon per day and in possession.

Frank Rue
Commissioner

By delegation to:

Alfred L. DeCicco
Area Management Biologist

JUSTIFICATION:

Coho salmon runs in Nome area streams in general are weak in 2000, and in some streams are very weak. Recent aerial survey and tower or weir counts indicate that there were fewer than 1,000 coho in many streams, and fewer than 100 coho in the Eldorado, Flambeau, and Solomon rivers. Although most streams in the Nome area are small, and do not receive large spawning escapements of coho salmon, the Department feels that limiting harvest in most streams is necessary to ensure that inriver escapements are adequate to maintain these small runs. In the case of the Eldorado, Flambeau, and Solomon rivers, escapements are so small that no additional harvest can be allowed.

DISTRIBUTION:

The distribution list for this E.O. is on file at the Region III office of the Alaska Department of Fish and Game office, Division of Sport Fish, 1300 College Rd. Fairbanks, AK. 99701, (907) 459-7207.

Appendix C2.–Emergency Order issued at Fairbanks August 27, 2001.

SPORT FISHING

Emergency Order

**ALASKA DEPARTMENT
OF FISH & GAME**

Under Authority of AS 16.05.060

Emergency Order No. 3-SS-03-01 Issued at: Fairbanks, August 27, 2001

Effective date: 12:01 A.M. August 28, 2001

Expiration Date: October 31, 2001

Unless superseded by subsequent
Emergency Order.

EXPLANATION:

This Emergency Order opens the Nome River to sport fishing for coho salmon effective at 12:01 AM, Tuesday August 28, 2001, with a daily bag and possession limit of one coho per day.

REGULATION:

This emergency order rescinds E.O. No. 3-SS-02-01, thereby opening the Nome River to sport fishing for coho salmon with a daily bag and possession limit of one coho.

Frank Rue
Commissioner

by delegation to: _____

Alfred L. DeCicco
Northwest Area
Management Biologist

-continued-

Appendix C2.–Page 2 of 2.

Emergency Order Number: 3-SS-03-01

August 27, 2001
Page 2

JUSTIFICATION:

The “special provisions” of 5AAC 70.022 (b) (6) were superseded by Emergency Order No. 3-SS-02-01. Under that Emergency Order, the following special provision were effective at 12:01 PM on Friday August 24, 2001: the Nome River was closed to fishing for coho salmon. The Nome River weir count as of August 23 indicated that only 251 coho had migrated upriver past the structure. There has been a push of coho counted past the weir since that time, and over 1,100 coho had moved upstream as August 26. It appears that escapement numbers will exceed recent odd-year (weak year) returns. Therefore, the department feels that it can reopen the Nome River to the harvest of one coho per day without adversely impacting the reproductive potential of the escapement.

The Department will continue to evaluate in-season run strength and may reduce or expand fishing opportunity as the return of coho nears its completion.

DISTRIBUTION:

Office of the Governor; Lt. Governor; Commissioner, Department of Fish and Game; Director, Division of Sport Fish; Regional Supervisors, Division of Sport and Commercial Fisheries; Members of Board of Fisheries; Director, Fish and Wildlife Protection; Detachment Commander and Area Officer, Board of Fisheries Members; Local Fish and Game Advisory Chairman; Anchorage, Cook Inlet, Delta, Fairbanks and Palmer Area Biologists, Division of Sport Fish and Commercial Fisheries; Juneau, Region I; Anchorage, Region II; Fairbanks, Region III; and selected area newspapers, radio and television stations.

Appendix C3.—Emergency Order issued at Fairbanks August 23, 2001.

SPORT FISHING

Emergency Order

ALASKA DEPARTMENT
OF FISH & GAME

Under Authority of AS 16.05.060

Emergency Order No. 3-SS-02-01 Issued at Fairbanks, August 23, 2001

Effective date: 12:01 A.M. August 24, 2001

Expiration Date: October 31, 2001
Unless superseded by subsequent
Emergency Order.

EXPLANATION:

This Emergency Order closes the Nome River to sport fishing for coho salmon effective at noon, Friday August 24, 2001. Any coho salmon caught while fishing for other species must be immediately released.

REGULATION:

The "special provisions" of 5AAC 70.022 (b) (6) are superseded by this Emergency Order. Under this Emergency Order, the following special provision is effective at 12:01 PM on Friday August 24, 2001: the Nome River is closed to fishing for coho salmon.

Frank Rue
Commissioner

by delegation to: _____
Alfred L. DeCicco
Northwest Area
Management Biologist

-continued-

Appendix C3.–Page 2 of 2

Emergency Order Number: 3-SS-02-01

August 23, 2001

Page 2

JUSTIFICATION:

Based on weir counts, the coho salmon run in the Nome river is lagging behind recent weak-year estimates and fish are not moving upstream in adequate numbers. The Nome River weir count as of August 23 indicated that only 251 coho had migrated upriver past the structure. In the past four days, no fish have moved upstream past the weir. This ranks the 2001 coho run in the Nome river behind the very weak runs in 1997 and 1999 as of this date. It is likely that other fisheries for coho salmon on the Nome River will also be further restricted to allow the few fish in the river to migrate upstream to spawning areas.

The Department will continue to evaluate in-season run strength and may reduce or expand fishing opportunity as the return of coho nears its completion.

DISTRIBUTION:

Office of the Governor; Lt. Governor; Commissioner, Department of Fish and Game; Director, Division of Sport Fish; Regional Supervisors, Division of Sport and Commercial Fisheries; Members of Board of Fisheries; Director, Fish and Wildlife Protection; Detachment Commander and Area Officer, Board of Fisheries Members; Local Fish and Game Advisory Chairman; Anchorage, Cook Inlet, Delta, Fairbanks and Palmer Area Biologists, Division of Sport Fish and Commercial Fisheries; Juneau, Region I; Anchorage, Region II; Fairbanks, Region III; and selected area newspapers, radio and television stations.

Appendix C4.—Emergency Order issued at Fairbanks August 20, 2001.

SPORT FISHING

Emergency Order

ALASKA DEPARTMENT
OF FISH & GAME

Under Authority of AS 16.05.060

Emergency Order No. 3-SS-01-01 Issued at: Fairbanks, August 20, 2001

Effective Date: 12:01 A.M. August 21, 2001

Expiration Date: October 30, 2001
Unless superseded by subsequent
Emergency Order.

EXPLANATION:

This Emergency Order reduces the sport daily bag and possession limit of coho salmon from 3 fish per day to 1 coho salmon per day in all waters of the Nome subdistrict and the Pilgrim River effective 12:01 P.M., Tuesday August 21, 2001.

The waters impacted by this action include all salt and fresh waters of Norton Sound between and including the Sinuk River in the west and the Solomon River in the East. In addition, this action also includes the Pilgrim River. Specific freshwater rivers affected by this Emergency Order are the Sinuk, Cripple, Penny, Snake, Nome, Flambeau, Eldorado, Bonanza, Solomon and Pilgrim rivers.

REGULATION:

The provisions of 5AAC 70.022 (b) (6,7,8,10, and 11) are superseded by this Emergency Order.

Under this Emergency Order, the following provisions are effective: In all waters of the Nome subdistrict from and inclusive of the Sinuk River in the west and the Solomon River in the east and the Pilgrim River 12:01 P.M. Tuesday August 21, 2001 the sport daily bag and possession limit for coho salmon is reduced to fish per day.

Frank Rue
Commissioner

by delegation to: _____
Alfred L. DeCicco
Northwest Area
Management Biologist

-continued-

Appendix C4.–Page 2 of 2.

Emergency Order Number: 3-SS-01-01

August 20, 2001

Page 2

JUSTIFICATION:

The coho salmon run in the Nome Subdistrict appears to be below average. Tower and weir counts as of August 20 indicate that the return is somewhat stronger than the very weak run in 1997 when all subsistence and sport fisheries were closed and only slightly stronger than the 1999 and 2000 returns. Subsistence fishing in the lower reaches of the Nome River is being further restricted to allow more fish to migrate to spawning areas.

The Department will continue to evaluate in-season run strength and may reduce or expand fishing opportunity as the return of coho nears its completion. At the present time, it is prudent to reduce the harvest potential of the sport fishery.

DISTRIBUTION:

Office of the Governor; Lt. Governor; Commissioner, Department of Fish and Game; Director, Division of Sport Fish; Regional Supervisors, Division of Sport and Commercial Fisheries; Members of Board of Fisheries; Director, Fish and Wildlife Protection; Detachment Commander and Area Officer, Board of Fisheries Members; Local Fish and Game Advisory Chairman; Anchorage, Cook Inlet, Delta, Fairbanks and Palmer Area Biologists, Division of Sport Fish and Commercial Fisheries; Juneau, Region I; Anchorage, Region II; Fairbanks, Region III; and selected area newspapers, radio and television stations.

Appendix C5.—Emergency Order issued at Nome July 31, 2001.

SPORT FISHING

Emergency Order

**ALASKA DEPARTMENT
OF FISH & GAME**

Under Authority of AS 16.05.060

Emergency Order No. 3-PS-01-01 Issued at: Nome, July 31, 2001

Effective Date: 12:01 A.M. August 1, 2001 Expiration Date: October 31, 2001

EXPLANATION:

This emergency order closes sport fishing for pink salmon in all fresh and salt waters of the Nome Subdistrict, effective 12:01 A.M., Wednesday August 1, 2001, until October 31, 2001. This emergency order prohibits the taking of pink salmon in the sport fishery in all fresh and salt waters from Cape Rodney in the west to Topkok Head in the east. All pink salmon incidentally caught while sport fishing for other species must be immediately released.

REGULATION:

5AAC 01.175 WATERS CLOSED TO SPORT FISHING is superseded by adding:

(d) the following waters are closed to sport fishing for pink salmon:

- (1) All fresh and salt waters from Cape Rodney to Topkok Head

Frank Rue
Commissioner

by delegation to: _____
Alfred L. DeCicco
Northwest Area Management Biologist
Division of Sport Fish
Fairbanks

-continued-

Appendix C5.–Page 2 of 2 .

Emergency Order Number: 3-PS-01-01

July 31, 2001

Page 2

JUSTIFICATION:

All available data indicates extremely low abundance of pink salmon in northern Norton Sound streams, particularly those in the Nome Subdistrict. As of July 29, only 465 pink salmon had moved upstream past the Nome River weir and fewer than 200 had been estimated to have passed the Snake River counting tower. Historically, approximately half the pink salmon run has returned to Nome Subdistrict streams by August 1.

Because of the weak runs, sport fishing for pink salmon in the Nome Subdistrict will remain closed for the rest of the open water season. Pink salmon caught while angling for other species must be immediately released.

DISTRIBUTION:

Office of the Governor; Lt. Governor; Commissioner, Department of Fish and Game; Director, Division of Sport Fish; Regional Supervisors, Division of Sport and Commercial Fisheries; Members of Board of Fisheries; Director, Fish and Wildlife Protection; Detachment Commander and Area Officer, Board of Fisheries Members; Local Fish and Game Advisory Chairman; Anchorage, Cook Inlet, Delta, Fairbanks and Palmer Area Biologists, Division of Sport Fish and Commercial Fisheries; Juneau, Region I; Anchorage, Region II; Fairbanks, Region III; and selected area newspapers, radio and television stations.

Appendix C6.—Emergency Order issued at Fairbanks, June 14, 2001.

SPORT FISHING

Emergency Order

ALASKA DEPARTMENT
OF FISH & GAME

Under Authority of AS 16.05.060

Emergency Order No. 3-S-01-01 Issued at: Fairbanks, June 14, 2001

Effective Date: 12:01 A.M. June 15, 2001

Expiration Date: July 31, 2001
Unless superseded by subsequent
Emergency Order.

EXPLANATION:

This emergency order closes fresh and salt waters in the Nome Subdistrict (from Cape Rodney in the west to Topkok Head in the east) to sport fishing for all salmon. Effective Thursday, June 14, until further notice, all salmon caught while sport fishing for any other species in fresh and salt waters from the Cape Rodney to Topkok Head must be immediately released.

This Emergency Order has no bearing on sport fishing for other fish species.

REGULATION:

5AAC 01.175. WATERS CLOSED TO SPORT FISHING is superseded by adding:

(d) the following waters are closed to sport fishing for salmon:

(1) All fresh and salt waters from Cape Rodney to Topkok Head

Frank Rue
Commissioner

by delegation to: _____

Alfred L. DeCicco
Northwest Area
Management Biologist

Appendix C6.–Page 2 of 2.

JUSTIFICATION:

Based on normal odd-year weak pink salmon runs, and the exceptionally weak run in 1999, the Department anticipates another very weak pink salmon return to northern Norton Sound in 2001. The waters of the Nome Sub-district will be closed to subsistence fishing for all salmon until such time that run strength can be assessed. Before subsistence fisheries can be closed, other fisheries must also be closed. Therefore, in order to comply with the subsistence priority, the sport fisheries for salmon will be closed to allow for the preseason subsistence salmon closure. This closure is being done in coordination with the Commercial Fisheries Division that manages Norton Sound subsistence fisheries. These fisheries may reopen if runs appear strong enough to support both subsistence harvests and sport fisheries.

DISTRIBUTION:

Office of the Governor; Lt. Governor; Commissioner, Department of Fish and Game; Director, Division of Sport Fish; Regional Supervisors, Division of Sport and Commercial Fisheries; Members of Board of Fisheries; Director, Fish and Wildlife Protection; Detachment Commander and Area Officer, Board of Fisheries Members; Local Fish and Game Advisory Chairman; Anchorage, Cook Inlet, Delta, Fairbanks and Palmer Area Biologists, Division of Sport Fish and Commercial Fisheries; Juneau, Region I; Anchorage, Region II; Fairbanks, Region III; and selected area newspapers, and radio stations.

List is available at ADF&G, Sport Fish Division, 1300 College Road, Fairbanks 99701

