Fishery Management Report No. 06-65

Fishery Management Report for Sport Fisheries in the Kuskokwim Management Area for 2003-2005

by
John Chythlook

December 2006

Alaska Department of Fish and Game **Division of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

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

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

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

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY MANAGEMENT REPORT NO. 06-65

FISHERY MANAGEMENT REPORT FOR SPORT FISHERIES IN THE KUSKOKWIM MANAGEMENT AREA FOR 2003-2005

by

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The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm. This publication has undergone regional peer review.

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PREFACE

The Division of Sport Fisheries (SF) of the Alaska Department of Fish and Game (ADF&G) is responsible for the management of the sport fisheries and resident fish populations and several marine fish species within the Kuskokwim Management Area. Salmon management in this area is a cooperative effort between the Divisions of Commercial Fisheries, Subsistence, and Sport Fisheries with consultation with the appropriate Federal managers.

This is the first Fishery Management Reports (FMR) detailing the management activities of the Sport Fisheries in the Kuskokwim and Kuskokwim Bay area since the management of sport fisheries in both the upper and lower Kuskokwim areas was consolidated into one area. From 2000 to 2003, catch and harvest information from the Statewide Harvest Survey was compiled into two separate reports for the Kuskokwim River: one that detailed the Lower Kuskokwim/Lower Yukon in a single FMR, and one that detailed the upper Kuskokwim as a part of the Arctic Yukon-Kuskokwim FMR. Administrative action within the Division of Sport Fish combined the Kuskokwim River into one administrative area in 2004.

Information within this report represents Sport Fisheries Division's most recent work to define and update the catch, harvest and angler effort of sport fisheries in the Kuskokwim Management Area. Catch, harvest and angler effort statistics were coalesced from Statewide Harvest Summaries, Survey and Inventory Reports, and department reports from Fishery Data, Management and Manuscript Series.

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 monies. The Fish and Game funds are from the sale of fishing licenses. The Federal Aid in Fisheries Restoration (or D-J, named after Dingell and Johnson 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, peripheral funding sources can include contracts with various government agencies and the private sector.

ABSTRACT

Sport fisheries management recommendations and background information for 2003-2006 in the Kuskokwim-Goodnews Management Area is presented. This information was provided to the Alaska Board of Fisheries, as well as the general public and interested parties. The Kuskokwim-Goodnews Management Area contains the Kuskokwim River, Kuskokwim Bay, Goodnews Bay, and drainages south of and including Nelson and Nunivak Islands. Summaries of major fisheries within the area are detailed, including descriptions of recent performances, Alaska Board of Fisheries regulatory actions, social and biological issues, and descriptions of ongoing research and management activities.

Information specific to the proposals that the Board of Fisheries will address at the January 31, 2007 meeting are contained within numerous sections of this report. Pertinent to the proposal regarding the designation of the Holitna River as a "reserve", sport fish catch and harvest information is included. The original document set forth by the authors asking for the reserve has been included.

Key words: Kuskokwim River, Kuskokwim Bay, Holitna River, Aniak River, Goodnews River, Kanektok River, lower Kuskokwim, upper Kuskokwim, sport fish, king salmon, coho salmon, rainbow trout, Dolly Varden, Arctic Char

INTRODUCTION

This is the first Fishery Management Report (FMR) with fishery statistics for the sport fisheries of the entire Kuskokwim River. Changes in the management areas in recent years have resulted in the Kuskokwim River falling into several different management and reporting areas. Prior to 2004, the Kuskokwim River fell into two Management Areas: the Lower Yukon/Lower Kuskokwim (LYLK) and the Arctic-Yukon-Kuskokwim (AYK) Management Area. Before 2000, the LYLK was shared between the Southcentral and Arctic-Yukon-Kuskokwim sport fisheries regions. Previous information regarding this management area can be located in the past FMRs of Bristol Bay and AYK and the Lower Yukon/ Lower Kuskokwim.

The first section contains a management overview of the area sport fisheries. This section includes brief descriptions of the management area, the regulatory process governing sport fishery regulations, Statewide Harvest Survey (SWHS) and effort information. Additionally, this section contains information on management plans and other issues within the management area. This section concludes with management, research, access projects and information sources within the area.

The focus of Section II is solely directed towards angler effort within the management area. A short review of the SWHS and specific angler effort of important area fisheries is represented in this section of the FMR.

Descriptions of the primary sport fisheries of the Kuskokwim Area are located in Section III which is partitioned into two sub-sections: salmon, and resident fish species. Although there are five species of Pacific salmon in the Kuskokwim River, this sub-section only addresses the sport fisheries for Chinook, coho, chum and sockeye salmon. The resident fish species sub-section addresses seven fisheries; these include rainbow trout, Dolly Varden/Arctic char, Arctic grayling, northern pike, sheefish, lake trout, and burbot. Each fishery description will include a historical perspective, management goals and objectives in addition to a brief summary and outlook for the upcoming year.

SECTION I – MANAGEMENT AREA OVERVIEW

DESCRIPTION OF THE AREA

The Kuskokwim includes those drainages beginning from the headwaters of the Kuskokwim River and all drainages in Kuskokwim Bay (Figure 1). Additionally, the Kuskokwim includes all drainages that flow into the Bering Sea from Cape Newenham to the south and including the Ninglick River drainage to the north; Nunivak, St. Matthew, and adjacent islands are included within the area as well.

The Kuskokwim is partitioned into three sections; the lower Kuskokwim River, upper Kuskokwim River, and Kuskokwim Bay (Figure 1).

The Kuskokwim Management Area includes substantial parts of two National Wildlife Refuges, the Yukon-Kuskokwim Delta Refuge and the Togiak Refuge. Nearly half of the Yukon-Kuskokwim Delta Refuge is within the Kuskokwim Management Area, as are several thousand acres of the Togiak Refuge in the headwaters of Kuskokwim Bay streams.

REGULATORY PROCESS

The Alaska Board of Fish (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 3 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 wintertime, 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). During its deliberations the BOF receives input and testimony through oral and written reports from staff of the Alaska Department of Fish and Game (ADF&G), 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 generally have only one fall and one spring meeting due to funding constraints. Advisory meetings allow opportunity for direct public interaction with department staff that answer questions and provide clarification concerning proposed regulatory changes. The Boards Support Section within the ADF&G Division of Administration provides administrative and logistical support for the BOF and Fish and Game advisory committees. During 2003, the department had direct support responsibilities for approximately 70 advisory committees in the state.

ADF&G EMERGENCY ORDER AUTHORITY

ADF&G has emergency order (EO) authority (AS 16.05.060, 1989) to modify time, area, and bag/possession limit regulations. EOs are implemented to deal with conservation issues that arise that are not adequately controlled by existing regulations. In that scenario, they deal with the situation 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 usually in accordance with a fisheries management plan approved by the BOF.

STATEWIDE HARVEST SURVEY

Research and Technical Services (RTS) of the Division of Sport Fisheries has been surveying the angling public with postal questionnaires since 1977 and annually produces the Statewide Harvest Survey (SWHS). Questionnaire recipients are randomly selected from zip codes from angler license sales throughout the State of Alaska. Surveys are based on the calendar year and statewide estimates are normally available in September or October of the following year. Anglers are primarily asked locations of sport fish harvest, catch, and effort spent fishing by days and trips. This information is used to create a statewide database providing information on where sport fishing occurs, the extent of participation, the preference of participants, and species and numbers of major game fishes being caught and harvested. This information is essential for regulation and management of these sport fisheries. The data is utilized to evaluate existing policies, prioritize project planning, and evaluate regulation effectiveness. Sport fish catch and harvest information is included in Tables 1 and 2.

SPORT FISHING EFFORT

Effort from anglers has been increasing in the State of Alaska from the inception of the SWHS, 1977 to the mid 1990s (Table 3). During the late 1990s there was a slight decline in license sales and angler effort, however, Alaska sport fisheries continue to provide more than two million angler days of effort since 1986. Effort has remained relatively stable in the Arctic-Yukon-Kuskokwim (AYK) region in the last 10 years, with some fluctuation year-to-year. Angler effort in 2005, however, was amongst the lowest in the last 15 years. Since 2001, angler effort within the Kuskokwim has averaged approximately 22,000 angler days. Effort in 2005 was much lower at just over 19,000 angler days. Much of the 2005 decline may relate to extremely high fuel and transportation costs, and subsequent rise in prices in all sectors of the economy, including sport fish guides and support industries. In addition, relatively recent regulation changes may have had an effect on the reporting by resident sport fishers in the region: in 2000, the BOF recognized rod and reel as a legal subsistence method within the lower Kuskokwim region, and this was extended to the whole Kuskokwim drainage in 2001. Subsequently, some fishers who would have responded to the Statewide Harvest Survey may instead be counted as subsistence rather than sport fishers.

SPORT FISHING HARVEST

Within the Kuskokwim and Kuskokwim Bay drainages recreational anglers primarily harvest salmon with resident species of secondary importance (Table 4). Coho salmon harvests exceed all other salmon species with an annual harvest range from 1,358 (1990) to 7,096 fish (2004) and averaging 3,900 coho salmon. The 2003-2005 coho harvests are well above the average. In 2005, the Chinook salmon annual harvest of 2,184 fish, was well within the historical range of 786 (1991) to 3,401 (1998) and above the average of 1,700 Chinook salmon. Dolly Varden/Arctic char harvests remain stable, ranging from 800 to 3,500. Rainbow trout harvest for the entire area has

remained stable and low in the last 5 years; usually well below the historical average annual harvest of 450 rainbow trout. This harvest decline in rainbow trout may be attributed to the changes in the subsistence rod and reel regulations and increased awareness of anglers practicing catch-and-release. Other notable harvests of resident fish species are Arctic grayling with a recent harvest of 1,287 fish and northern pike with a recent harvest of 3,749 fish (Table 4).

SALMON MANAGEMENT POLICY

Recent Changes

Significant additional policies were adopted into regulations to guide the BOF and department in sustainable salmon management (5 AAC 39.222, 2000) and in establishing salmon escapement goals (5 AAC 39.223, 2001) during the January 2001 BOF meeting. These policies continue to evolve, but they are designed to complement each other and are a reflection of the department and BOF continuing commitment to improve salmon management.

The Sustainable Salmon Management Policy (SSMP) is a comprehensive policy to guide management plan development and to ensure the conservation of the state's salmon resources in both freshwater and marine environments. Salmon conservation and management are based on principles and specific criteria, including habitat protection, escapement levels, and effective management systems, recognizing data uncertainty and reporting to the BOF. Additionally, the policy provides a framework to identify stocks of concerns based on yield, management or conservation and an extensive definition of terms. The escapement goal policy supplements the SSMP to conserve and develop the state's salmon resources based on sustained yield principle.

The Statewide Salmon Escapement Goal Policy (SSEGP) was established to define concepts, criteria and procedures for initiating and modifying salmon escapement goals along with a process that allows public review to focus on allocative issues of the state's salmon resources. In 1992, the department began formalizing escapement objectives; however, it became evident there were varying degrees of stock specific production information across the state's salmon stocks. Therefore, the existing salmon escapement goal policy was not representative of the existing stock specific production information. The recently adopted escapement goal policy recognizes that identifying escapement goals for sustained yield management is a continuing process.

Kuskokwim Chinook and chum salmon stocks were recognized as stocks of yield concern during the last Board cycle; they are subject to review this cycle, and due to recovery of the strength of the runs, will likely be removed from this classification. A yield concern is defined as the inability to maintain expected yields or harvestable surpluses with the use of specific management actions. A yield concern is less severe than management and conservation concerns. Principles of these policies were applied to the management plans of Kuskokwim salmon stocks to ensure that adequate escapement objectives are identified and harvest strategies are developed to achieve escapement objectives.

MANAGEMENT PLANS

Currently, there are three management plans specific to sport fishing for the Kuskokwim: the Southwest Rainbow Trout Plan, the Aniak River Plan, and the AYK Lake Trout Management Plan. These plans address time, area, and method and means of harvesting salmon and resident fish species in designated waters. The objectives are to provide opportunities to harvest a relatively small proportion of the sustainable surplus over the fishing season without unnecessary disruptions to the sport fishery. In the past, management plans have been designed to give managers guidance

over inseason management, frequently addressing salmon management. Salmon management in the Kuskokwim is governed by subsistence regulations and several management plans directed at controlling commercial fisheries harvests. Subsequently, managers from Commercial Fisheries Division take a lead role in the management of salmon in this area of the state. Most of the subsistence and commercial fishing regulations are interconnected to provide opportunity to harvest salmon surpluses on the Yukon and Kuskokwim rivers.

Salmon Management Plans

Subsistence fishing seasons and periods are the guiding regulations in the harvest of salmon in the Kuskokwim River (5 AAC 01.210, 2004 and 5 AAC 01.260, 2004, respectively). There are two salmon management plans that guide commercial fishing in the Kuskokwim Management Area. In the Kuskokwim area, including streams in the Kuskokwim Bay, there are two salmon management plans:

1. Kuskokwim River Salmon (5 AAC 07.365, 2004); and,
2. District 4 (Quinhagak) Salmon (5 AAC 01.367, 2004).

Recent Changes

In October 2006, during a BOF work session, ADF&G identified western Alaska salmon stocks that were subject to review to consider their status as stocks of concern. The BOF informed the department that these issues would be addressed during the February 2007 meeting under the Sustainable Salmon Fisheries Policy. The stocks tied to a yield concern in the Kuskokwim River are: Kuskokwim River Chinook Salmon, Kuskokwim River Chum Salmon.

During the 2004 BOF meeting, the stock of concern designation remained on these stocks, first designated during the 2001 BOF meeting.

During the January 2001 BOF meeting the Sustainable Salmon Management Policy was applied to the existing Chinook and chum salmon management plans of the Yukon and Kuskokwim rivers. Resulting modifications were formulated into comprehensive rebuilding measures by placing windows of salmon passage in migratory routes in freshwater and marine environments. Windows included: restrictions to the Area M fishery, moving the northern commercial fishing boundary of W-4 (Quinhagak) three miles south (Oyak Creek), closing the Kuskokwim commercial fishery during the months of June and July, adjusting the subsistence fishing schedule to four consecutive fishing days in the Kuskokwim and basing sport fishery restrictions on in-season abundance, except for the Aniak River. Many of the existing and a few new restrictions in the Aniak sport fishery were included within the Kuskokwim rebuilding plan, including the continuation of the annual Chinook salmon season from May 1-July 25 with a daily limit of 2 Chinook salmon and annual limit of 2 Chinook salmon greater than 20 inches. On the Aniak River, a combined bag and possession limit of three other salmon species (pink, sockeye and coho) per day remains in effect. No retention of chum salmon remains in effect in the Aniak River. Additionally, the Yukon commercial fisheries would only open based on in-season assessments to ensure escapement objectives are met, and subsistence schedules would be flexible to ensure escapement objectives were met. Sport fisheries management would be commensurate with inseason abundance.

EOs were issued in 2001, 2002, and 2003 to reduce the bag and possession limit for Chinook and chum salmon in the Kuskokwim River drainage. In 2002, these measures were also forced by a closure of the Kuskokwim River to sport fishing by the Federal Subsistence Board. Such

measures did not prove necessary during the subsequent 2004 and 2005 seasons, though there was a precautionary EO in place in 2004 to reduce Chinook bag and possession limits that was rescinded early in the season.

RESIDENT FISH MANAGEMENT PLANS

As recently as the 1990s, sport fishing bag limits were generous and were used as a surrogate for subsistence uses in the Kuskokwim drainage. With the advent of rod and reel being included as a legal method for subsistence users in the entire Kuskokwim drainage (July 2001) and lower Yukon (March 2000), sport fish regulations apply only to non-resident anglers. Management of resident fish species in the Kuskokwim is under subsistence and sport fishing regulations. The subsistence regulations of the Kuskokwim are an exception to resident species management throughout the state of Alaska. This and the lower Yukon are the only areas of the state where a resident of Alaska can harvest unlimited quantities of resident fish (except rainbow trout) under subsistence regulations. There are also seasonal limitations on subsistence harvests in the Aniak River. The Aniak River has the only subsistence management plan in the Kuskokwim.

Within the Kuskokwim drainage and Kuskokwim Bay there are several tributaries which have considerable headwater reaches under special management to protect rainbow trout stocks under sport fishing regulations.

Southwest Alaska Rainbow Trout Management Plan

During the February 1990 BOF meeting, the Board adopted regulations implementing criteria for establishing special management areas for trout (ADF&G 1990). Special management areas were created to provide a diversity of sport fishing opportunity, such as catch-and-release, fly-fishing only or trophy designation. This management plan has three primary aspects.

1) Native rainbow trout populations will be managed to maintain historic size and age composition and at stock levels sufficient such that enhancement (or stocking) is not needed to supplement wild populations.

2) A diversity of sport fishing opportunities for wild trout should be provided through establishment of special management areas by regulation. Selection of areas for special management will be based on criteria to be adopted by the BOF. Selection criteria is inclusive of the following:
    a) stock status,
    b) history of special management,
    c) proximity to local community,
    d) legal access,
    e) overlap with freshwater net fisheries,
    f) abundance and size of rainbow trout,
    g) water characteristics,
    h) clear geographical boundaries,
    i) importance of the rainbow trout fishery to sport fishing industry, and
    j) geographical distribution of special management.

3) Management strategies should be consistent with prudent economic development of the State's recreational sport fishing industry and at the same time acknowledge the intrinsic value of these fishery resources to the people of Alaska.

The implementation of this plan:

a) Expanded the Wild Trout Zone from the Iliamna drainage to include the drainages of Bristol Bay, Kuskokwim Bay and lower Kuskokwim River including the Aniak River drainage.

b) Established eight catch-and-release areas.

c) Established six fly-fishing catch-and-release only areas.

d) Established eleven unbaited, single-hook, artificial lure only areas to protect rainbow trout stocks in Southwest Alaska.

During the March 2003 BOF meeting a statewide rainbow trout management plan was adopted. This plan allows a bag and possession limit of 2 per day, of which only one can be 20 inches or longer and only allowing the annual harvest of 2 rainbow trout 20 inches or longer. The department and BOF are now in the process of reviewing rainbow trout regulations that are not under special management designation.

Aniak River Resident Fish Management Plans

Temporary sport and subsistence management plans for resident fish species sunset in December 2000 in the Aniak River (for prior regulation history see Lafferty 2001). Subsequently regulation changes were made during the January 2001 BOF meeting regarding the management of subsistence and sport fisheries in the Aniak River. To provide flexibility and uncomplicated bag and possession limits for both subsistence and recreational anglers, the BOF adopted an aggregate (group) bag limit for the Aniak River fisheries. Subsistence anglers (any Alaskan resident) are restricted during the period of June 1 through August 31 to an aggregate bag limit of six fish, of which no more than three could be salmon and three resident fish species upstream of Doestock Creek. Additionally, subsistence anglers cannot retain rainbow trout upstream of Doestock Creek between June 1 through August 31. To provide continuity between subsistence and sport fishing regulations, the aggregate bag limit was carried over to the recreational fishery in the Aniak River. The increasing restrictive character of the Aniak sport-fishing regulations are based on a precautionary approach driven by local social concerns. Rainbow trout may not be retained throughout the drainage at any time. All other resident fish species have a daily bag and possession limit of one; however, the aggregate bag limit only allows three fish a day in the Aniak River. Additionally, lures are restricted to unbaited, single-hook, artificial upstream of Doestock Creek year-round following the catch-and-release implementation of the Southwest Rainbow Trout Management Plan in the 1990s. The Aniak sport fishery has the most restrictive regulations for a remote sport fishery in the state of Alaska.

Land Use Management Plans

The Togiak and Yukon–Kuskokwim National Wildlife refuges produce Fisheries Management Plans (FMPs) within the LYLK. These plans generally acknowledge the state's authority for the management of sport fisheries and have little direct effect on the day-to-day management of the area's fisheries. Department staff have worked with the U.S. Fish and Wildlife Service (USFWS) refuge staff to develop these plans. These plans are essentially a list of fishery-related issues and concerns and projects that address these concerns. Each refuge plan has a 5-year duration, after which a review process begins. In 1999, the Togiak FMP was adopted and a comprehensive conservation planning phase was implemented. The Togiak Comprehensive Conservation Plan (CCP) has been under development and public review began in December 2001, and continued to be under review until adoption in 2005. There are significant numbers of

suggestions within this plan that address sport-fishing issues in Kuskokwim Bay. The state has responded to several sport fishing issues within the Togiak CCP, particularly the issue of quality of sport fishing opportunity and quality of subsistence opportunities. The Yukon-Kuskokwim Delta Refuge FMP was adopted in 1992 and has been gradually implemented.

A Public Use Management Plans (PUMP) has been adopted for the Togiak Refuge and allows for certain activities on refuge lands. Commercial sport fishing services are a significant portion of the Togiak Refuge PUMP. Much of the sport fishing effort within the Togiak Refuge is guided, therefore the plan affects guided access and activities that affect opportunity in the sport fisheries. In general the PUMP established levels of commercial use under land lease requirements on a river-by-river basis. Unguided uses are presently unconstrained in the Togiak PUMP. The Togiak PUMP is complex, requiring operators to submit prospectus applications and bid for the privilege to lease refuge lands for the purpose of providing angler services.

The Togiak PUMP was adopted in 1991. Since adoption, four minor amendments have been made. On schedule in 1995, the Togiak Refuge began review and revision of the plan when the amount of guided use equaled visitor use. The department assisted refuge staff during the 2005 review process of the Togiak CCP.

OTHER USE ISSUES

1. Development of New Sport Fisheries in Rural Alaska. Relatively rapid development of sport fisheries in remote areas has resulted in friction between local residents and the non-local anglers. In many instances, local people have historically enjoyed nearly exclusive use of fishery resources. Sport fishing guides and other anglers seeking less crowded fishing opportunities in wilderness settings continue to "discover" less well known but potentially high quality fisheries. As currently popular fishing destinations in Bristol Bay and Southcentral Alaska become increasingly crowded, anglers and guides are likely to continue to travel farther to participate in Alaska's fisheries. In addition to the social friction caused by this change in use patterns of remote areas and to some extent because of this friction, the department will increasingly be expected to provide information on the status of stocks for which there is currently only the most rudimentary information. This is likely to be the biggest challenge in the management of sport fisheries in the AYK Management Area. Recent experiences at the Dall, Holitna, and Innoko rivers are examples of the type of challenges that we should anticipate.

2. Rod and Reel Subsistence. In 2000, the Alaska BOF included rod and reel gear as legal a subsistence fishing method for harvest during the open water season in the Association of Village Council Presidents (AVCP) area of the lower Yukon and Kuskokwim rivers. In 2001, rod and reel subsistence fishing was extended upstream in the Kuskokwim by emergency regulation in response to a petition to the BOF from Nikokai Native Village and the Western Interior Regional Advisory Council. Until these actions were taken, rod and reel for subsistence fishing was permitted only through the ice under state regulations. Harvest of fish with rod and reel during open water periods in the remainder of the state is regulated under Sport Fishing regulation. The primary concern with this potential change is how to manage for sustainable fish populations with legalization of rod and reel gear for subsistence fishing. We understand that rural resident use patterns have likely incorporated rod and reel in past subsistence harvests, and legalization of this gear will not greatly affect local use patterns. Our greatest concerns relate to changes in urban resident behavior in regard to license sales, visitation to rural fisheries, and harvests of fish populations.

3. Rural resentment of sport fishing and sport anglers. Some rural Alaskans generally 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 is particularly strong towards catch-and-release practices. This conflict of values has lead to resentment towards sport anglers who wish to fish on private and public lands within the AYK area.

4. Federal Fishery Management for Subsistence in Alaska's navigable waters. In October 1999, Federal fishery managers assumed responsibility for ensuring a rural subsistence priority on navigable waters adjacent to or within the boundaries of Federal Conservation units. There is widespread concern that one result of this action will be reduced opportunity for sport fishing throughout the state. Because of the large amount of Federal public land within the Kuskokwim and all of the AYK Management Area, and because of the high proportion of subsistence users, this loss of opportunity is of acute concern for sport fishermen in the AYK Management Area. Recent proposals to the Federal Subsistence Board to exclude recreational anglers from popular fisheries have required substantial efforts by ADF&G staff to maintain current opportunities.

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 composed of two parts. The first involves capital improvement projects, which are of a durable nature, and involve major construction. Typical projects include construction of boat launches, parking areas, camping areas, handicap-accessible public fishing docks, access roads, improved trails, and the purchase or lease of lands or right-of-ways to ensure public access. The second portion of the program is called the Small Access Site Maintenance Project. This ongoing, annually funded program involves maintaining and upgrading existing angler access sites. Activities include placing and maintaining (replacing vandalized) signs at lake and river angling access sites, constructing and maintaining pedestrian and Off Road Vehicle trails to fishing sites, securing permanent right-of-ways on public and private land to ensure continued public access to fishing and boat launching sites. The program also maintains access roads to boating or angling sites that might not otherwise be maintained, provides portable toilets, picnic tables, and trash removal at heavily used roadside angling sites, constructs and maintains outhouses and tent platforms at remote angling sites, and produces and prints publications which inform anglers about fishing and boat launching opportunities.

To date relatively few access projects have been proposed for rural Kuskokwim area. An upgrade of the boat launching site in the Kuskokwim River community of McGrath is currently under review. Presently, there are no major access issues for sport fishing in the Kuskokwim. However, there are several small-scale access issues similar to the following:

The land status surrounding the Arolik River continues to be in dispute between the federal and state governments. The Bureau of Land Management (BLM) determined that portions of the Arolik River were non-navigable and under the Alaska Native Claims Settlement Act conveyed shore-lands to Quanirtuuq Inc. as part of their entitlement under the Act. However, the State of Alaska received title to inland navigable water bodies as provided in the Statehood Act of 1958 and the U.S. Submerged Lands Act of 1953. Therefore the State of Alaska asserts that those shore-lands were not in federal ownership and were not BLM's to convey.

CURRENT MANAGEMENT AND RESEARCH ACTIVITIES

A mainstem Chinook radio telemetry project has been instrumental in defining Chinook escapement distributions and the magnitude of the Chinook runs into the middle Kuskokwim. In addition, a sheefish radiotelemetry project that is funded by the Fish and Wildlife Service's Office of Subsistence Management is scheduled for a fall 2007 start, and rainbow trout mark/recapture projects are in the planning stages for the near future.

INFORMATION AND EDUCATION SOURCES

At the regional level there is a single coordinator position that provides area support from the Fairbanks Sport Fish Informational Center. At the area level, the area manager provides public contact that supplies local information and educational needs. Local teachers and other groups have contacted the Bethel and Fairbanks office for assistance and support. Angler publications are continuing to evolve in this area of the state. Additionally, a database was revised of local license vendors that are interested in participating in posting sport fishing EOs. This may tie in with the sport fish guide logbook requirement that was implemented in 2005.

The Division of Sport Fish has been active in strategic planning with staff and the general public. This ongoing evaluation process is an instrument for the public to evaluate the performance goals of the division and to develop input to insure the division is pursuing goals outlined by the public through a public planning process.

SECTION II – EFFORT

DESCRIPTION OF STATEWIDE HARVEST SURVEY

Stream or stock specific estimates of angler harvest, catch and effort are estimated across the state through a postal questionnaire. Estimates of sport angler harvest, catch and effort are reported annually and the report is commonly referred to as the SWHS (Howe et al. 1995, 1996, 2001a-d; Jennings et al. 2004, 2006 a-b, *In prep a-b*; Mills 1977-1981a-b, 1982-1994; Walker et al. 2003). This survey randomly selects anglers based on their residence zip code and questionnaires are sent out at the end of the calendar year. This voluntary survey asks anglers to record their days of fishing at specific locations and the catch and harvest of salmon and resident freshwater fish and saltwater fish. Because this survey is based on the calendar year, the estimates and report are not generated until late fall of the following year.

Sport Fish Division uses the SWHS extensively because of the wide expanses and number of sport fisheries within the state. This survey has been collecting angler harvest statistics since 1977. There have been many additions to the SWHS since the initial postal questionnaire to address concerns on the harvest of salmon and resident fish throughout Alaska. This survey is one of the strengths of sport fisheries management in the State of Alaska. Managers rely on this report to monitor the vast majority of Alaska sport fisheries. Often estimates generated by the SWHS come into question and in some instances the Division of Sport Fish will initiate an in-season survey to validate these estimates. The SWHS is an excellent tool for estimating sport fishing harvests, catches and angler effort in large fisheries, which have a large amount of angler participation. However, it is recognized by fishery managers that smaller fisheries provide less precise estimates and these are used as indices of harvest and catch. As the level of angler participation increases in a given fishery so does the level of confidence that department has in

the SWHS estimate for that fishery. Comparisons of SWHS estimates and in-season harvest surveys are regularly published in the annual report.

As sport fisheries mature in the Kuskokwim, the focus of the SWHS may likely shift from an area perspective to a specific stock or stream. Stock specific information is an essential tool for regulating fishery development to conserve salmon and resident fish.

OVERVIEW OF AREA EFFORT

Sport fisheries began to develop in the Kuskokwim during the mid 1980s. It was during this time period that sport fisheries in this area began to surface in the SWHS. Largely, sport fisheries of the Kuskokwim were small, isolated, and were receiving little effort and hence small catch and harvest. As sport fisheries developed, the SWHS started to partition the prominent area fisheries by stream/river in 1983 (Table 5).

Angling effort in the Kuskokwim is third in ranking of the angling effort in the AYK region, second to the upper Copper/ upper Susitna and Tanana Management Areas. This is no surprise when considering the distribution of the human population in the AYK region.

Angling effort in the lower Kuskokwim and Kuskokwim Bay reached a high of 26,400 angler days in 1996, but these areas recently average about half of this amount. This decline may attributed in part to decline of sport fishing licenses sold within the area to residents, and also may be related to sustained high fuel and transportation costs to and within the region. Recently, anglers have been expending twice the amount of effort in the streams and lakes of Kuskokwim Bay in comparison to the lower Kuskokwim River. There are three sport fisheries that dominate the area; they are the Kanektok, Aniak and Goodnews rivers. All three of these streams provide salmon and rainbow trout fisheries in a remote Alaska setting. A fourth candidate, but with far less effort expended in angler days for its large size, would be the Holitna and surrounding drainages (Tables 1 and 2).

Angler Effort in 2003-2005

Angling effort in 2003 and 2004 was similar to recent years, within the approximate 10 year range of 17,000 to 25,000 angler days (Table 5) in the Lower Kuskokwim and Kuskokwim Bay sport fisheries. Effort in 2005, however, showed a marked decrease throughout the lower Kuskokwim and Kuskokwim Bay. The decline of approximately 5,000 angler days may be a result of higher fuel prices and cumulative resulting costs. The recent changes in subsistence regulations allowing rod and reel fishing without a sport fishing license likely doesn't account for this decrease, as this presumably would have been observed earlier, when these regulation changes were implemented in 2002. Below average effort was documented for Kuskokwim Bay streams and lower Kuskokwim tributaries in 2005.

Angling effort in the Aniak River during 2004 was slightly above average and 2005 was near the historic average (Table 5). The effort on the Kisaralik River was 1,000 angler days above average in 2004 and then 1,000 angler days below average in 2005. The annual angling effort on the Kwethluk River is currently about 2,000 angler days, and has been similar from 2003-2005.

Angling effort in the upper Kuskokwim including the Holitna drainage was higher than average in 2003 and 2004 (Table 1) but near average in 2005. Effort in the entire upper Kuskokwim area remains very light: for example, the average effort in many of the Kuskokwim Bay streams exceeds the entire effort for the Upper Kuskokwim and Holitna areas (Tables 1 and 4). Except

for the Holitna River fishery, estimates of recreational effort or catch are generally not reported by the SWHS because of the small level of participation in these fisheries.

Estimates of overall angler effort of the Kuskokwim in 2003 and 2004 suggest that these years were average. Observations of angler effort can be characterized as well below average in 2005. In addition to the Statewide Harvest Survey, these observations were based on angler reports, aerial effort surveys and boat counts in popular fisheries of the area. Most sport anglers are either participating in float trips or employing guiding services.

SECTION III – FISHERIES

SALMON FISHERIES

Chinook Salmon Fishery Description

Overview

Chinook salmon are present in most streams throughout the Kuskokwim Area. Chinook salmon are predominately caught and harvested in tributaries of Kuskokwim Bay and tributaries of the lower Kuskokwim River. The largest sport fisheries for Chinook salmon are located in the Kanektok and Aniak rivers. These two sport fisheries average approximately 6,700 and 2,400 angler days of effort, respectively, (Table 5) across all fish species. Very few Chinook salmon are caught and harvested in the sport fisheries in the upper Kuskokwim tributaries which includes the Holitna River.

The Kuskokwim River and tributaries contain large runs of Chinook salmon, but many streams are broad and turbid, thus directing the sport fishing to clearwater tributaries. These salmon fisheries attract a very small number of anglers to western Alaska each year.

Historical Perspective and Fishery Management

Sport harvests and effort are estimated through the SWHS and reported by Mills (1983-1994), Howe et al. (1995, 1996, 2001a-d), Walker et al. (2003), Ward (2003), Jennings et al. (2004, 2006 a-b, *In prep a-b*). These estimates of harvest and catch are summarized in the previous FMRs (Lafferty 2001 and 2003). Additional Kuskokwim area commercial and subsistence harvest information for 2003-2005 can be found in Whitmore (2005) and Linderman (2005). Sport Fish Division has monitored both the Kanektok and Aniak river sport fisheries with additional in-season harvest surveys and stock assessment projects in the past (Minard 1987, Minard and Brookover 1988; Dunaway and Bingham 1992, Dunaway and Fleischman 1995, Dunaway 1997; Lafferty and Bingham 2002). Additionally, the USFWS, Togiak Refuge, has collected age and size data from Chinook salmon spawning in the Kanektok since 1994 (Lisac and MacDonald 1995, MacDonald 1996).

The department has focused on assessing salmon escapements and harvest monitoring through several programs in the Kuskokwim area. Commercial harvest monitoring is conducted through fish tickets and surveys are utilized to estimate harvests from the subsistence and sport fisheries. Salmon escapement is monitored through aerial surveys, sonar, test fishing, and weirs in the Kuskokwim River. The primary Chinook salmon escapement programs in the Kuskokwim are aerial surveys, and the Kogrukluk weir. There have been recent weir additions to further the department understanding of Kuskokwim escapements. Although mainstem sonar has been considered in the past, a mark-recapture experiment was initiated in 2002 and continues at Kalskag to assist in understanding run strength and escapement.

Most of the Kuskokwim Chinook escapement objectives are based on aerial survey information. Often these aerial surveys are sporadic because of aircraft availability or weather conditions and this method of evaluating escapement has been unsatisfactory in understanding Kuskokwim Chinook salmon production. Therefore, the department has invested in weir operations in locations where feasible. Generally the locations of these weirs is not based on the proportion of the total run using a tributary but on the suitability of the site for weir maintenance. Many of the larger tributaries and probably the larger stocks of Chinook salmon, such as the Aniak and Holitna rivers have no complete assessment other than sporadic aerial surveys of Chinook salmon or a singular tributary weir on the Kogrukluk River (Holitna tributary). The test fishing in the lower Kuskokwim, near Bethel, only provides indices of daily passage and not a measure of escapement.

In recent years, weirs have been used to enumerate escapements on the Kwethluk, Tuluksak, George, Kogrukluk, Tatlawiksuk, and Takotna rivers. Kuskokwim salmon escapement or weir projects in recent years are improving the department's ability to count escapement and are integral parts to complying with the sustainable salmon policy and the development of escapement objectives. In addition, from 2001-2004 a mark-recapture study was conducted on the Holitna River to estimate abundance of Chinook salmon in that system (Wuttig and Evenson 2002; Chythlook and Evenson 2003; Stroka and Brase 2004; Stroka and Reed 2005). Because of the success of this project in 2001, it was continued in 2002 and 2003. Additionally, in 2002, a mainstem mark-recapture project was implemented by Commercial Fisheries Division to assess Chinook, chum and coho salmon abundance upstream of Kalskag. Sport Fish Division has supported an ongoing Chinook radiotelemetry project that occurred on the mainstem Kuskokwim from 2002 through 2006 which Commercial Fisheries Division will continue in 2007. Aerial surveys remain an important in-season component of Chinook salmon assessment in the Kuskokwim area (Table 6).

Regulatory chronology of area sport fisheries for Chinook salmon:

- 1965 – Kuskokwim drainage Chinook salmon bag limit of 15 per day, 30 in possession;
- 1985 – daily bag and possession limits for Chinook salmon were decreased to 5 Chinook salmon, with no size restrictions;
- 1988 – daily bag and possession limits were decreased to 3 Chinook salmon, of which only 2 can be greater than 28 inches or larger;
- 1988 – Kuskokwim River drainages – daily bag and possession limits reduced to 1 Chinook salmon, no size limit;
- 1995 – Kuskokwim River drainage –daily bag and possession limit increased to 3 Chinook salmon, of which only 2 can be greater than 28 inches;
- 1997 – May 1 to July 25, sport fishing season was established to protect spawning fish. In some locations fishing gear was restricted to single-hook, artificial lures;
- 2001 – statewide acceptance in freshwater, that all Chinook salmon less than 20 inches are considered "jack salmon" and not count towards daily bag and possession limit; and,
- 2001 - within the Aniak River drainage, only 2 Chinook salmon greater than 20 inches allowed in the daily bag limit and no more 2 Chinook grater than 20 inches in annual bag limit.

Current Kuskokwim Chinook salmon regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Season May 1- July 25
- Aggregate salmon bag limit, only two Chinook salmon greater than 20 inches a day.
- Annual bag limit of two Chinook salmon greater than 20 inches.

Kisaralik, Kasigluk, and Kwethluk Rivers

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Season May 1- July 25
- Bag and possession limit of Chinook salmon is three a day, only two over 28 inches a day.

In all Kuskokwim waters downstream of the Holitna River and including the Holitna River.

- Season May 1- July 25
- Bag and possession limit of Chinook salmon is three a day, only two over 28 inches a day.

Remainder of the Kuskokwim River drainage

- Bag and possession limit of Chinook salmon is three a day, only two over 28 inches a day.

Current Kuskokwim Bay Chinook salmon regulations:

Kanektok and Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- Season May 1- July 25.
- Bag and possession limit of Chinook salmon is three a day, only two over 28 inches a day.

Arolik River and remaining waters of Kuskokwim Bay

- Season May 1- July 25.
- Bag and possession limit of Chinook salmon is three a day, only two over 28 inches a day.

Sport harvests of Chinook salmon are very small and minor in comparison to the commercial and subsistence harvests of the area (Tables 7-9). However, there is angler desire to participate in the Chinook fisheries of the Kuskokwim area (Tables 10 and 11). The average angler-stay in western Alaska for fishing is at least six days which equates to approximately 1,700 anglers utilizing the tributaries of the Kuskokwim Bay and 1,300 anglers coming to tributaries in the lower Kuskokwim River.

Historically, these 3,000 anglers were harvesting 1,500 Chinook salmon from a total catch of 10,600 Chinook salmon during 1983-2005 (Tables 10 and 11). Harvests during the last 5 years have remained low and the total catch has maintained the historical average of 10,600 Chinook salmon. It is doubtful that hooking mortality is a significant factor, as all of the salmon studies associated with delayed mortality of salmon when caught with hook and line gear in Alaska are conducted in areas adjacent to marine waters. Most of the anglers participating in the Kuskokwim area Chinook fisheries are via float trips in tributary headwaters, a significant distance from estuarine waters. Furthermore most of the popular sport fisheries have significant river segments under unbaited, single-hook, artificial lure requirements to protect rainbow trout under special management. Accepting that delayed hooking mortality is minor, 5% or less (Bendock and Alexandersdottir 1992), the overall fishing mortality (harvest + delayed mortality) can account for an additional 500 Chinook salmon from the area sport fisheries, bring the total removal by the sport fishery to 2,000 Chinook salmon under the current regulations. The Kuskokwim Area sport harvest of Chinook salmon is small when compared to other harvests of Chinook salmon in the area.

The harvest of Chinook salmon in the Kuskokwim River drainage sport fisheries has remained low (several hundred a year in recent years). This is likely due in part to care taken to not retain sport caught Chinook in the Kuskokwim during times when this stock has been designated as a stock of concern. Chinook harvests in the Kuskokwim Bay sport fisheries have remained stable at about 1,000 annually. Catches of Chinook salmon in the sport fishery follow a general trend, for each Chinook harvested, 10 are caught and released in this area.

Summary of 2004 and 2005 Seasons

In 2004, the subsistence schedule was implemented on June 1 in the lower Kuskokwim, following the Kuskokwim Salmon Rebuilding Plan. A precautionary EO was issued by Sport Fish Division restricting Chinook and chum salmon bag limits for sport fish to one fish of each species. Subsistence and sport catches in late May and early June indicated that Chinook salmon were entering the Kuskokwim on time and showed up in good numbers (Tables 6 and 8).

In 2004, Chinook salmon abundance was characterized as above average by sport fishers in the lower Kuskokwim and Kuskokwim Bay streams where most sport fishing for Chinook occurs. In addition, Chinook salmon escapements from composite index results from 2004 aerial surveys suggested the highest spawning ground Chinook salmon abundance since monitoring began in 1975 (Whitmore et al. 2005). As is usually the case, the brunt of the Chinook salmon sport fishery was prosecuted in the lower Kuskokwim and Kuskokwim Bay, though there is always a very small catch and harvest in the upper Kuskokwim River, which includes the Holitna river drainage (Tables 1 and 2).

In 2005, the subsistence schedule was again implemented on June 1 in the lower Kuskokwim, following the Kuskokwim Salmon Rebuilding Plan. Sport and subsistence catches again indicated good numbers.

To corroborate this, the Kuskokwim Chinook radiotelemetry project, using an unstratified model, estimated the abundance of Chinook salmon ≥450 mm for the Kuskokwim River upstream of the confluence of the Aniak River at 145,373 fish (SE=15,528) with a 95% confidence interval of 119,300 to 181,900. The abundance of Chinook salmon ≥450 mm that entered the Holitna River drainage was estimated at 72,690 fish (SE=8,510) with a 95% confidence interval of 58,790 to 93,320. Approximately 50% of the total Chinook salmon escapement above the confluence of the Aniak River was estimated to have been made up of Holitna River drainage stocks (Stuby 2005).

Sport fishing reports from the Kuskokwim Bay fisheries were generally good throughout the Kuskokwim Bay and lower Kuskokwim tributaries, and remained so until the Chinook closure on July 25. Sport fishers in the Holitna drainage took very few Chinook, with very little corresponding catch (Tables 1 and 2).

By mid July, test fishery indices for Chinook salmon had begun to subside, cumulative counts continued to remain above the historical median. Catch numbers from the tagging project upstream of Kalskag began to decline, but tagging crews continued to meet tagging objectives. Escapement weirs counts of Chinook salmon were above average in the lower tributaries, and average in the mid and upper tributaries of the Kuskokwim.

Fishery Outlook

Kuskokwim River and Tributaries

Given the recent performances of Chinook salmon returns in the Kuskokwim and Yukon rivers, an average to above average return is expected in 2007. The 2006 Kuskokwim Chinook returns provided an adequate surplus for an average commercial harvest (incidental to the chum salmon fishery). The department's ability to forecast Chinook salmon returns is limited, but recent year returns indicate that good run strength should continue in 2007. A directed commercial fishery for Chinook salmon in the Kuskokwim has not been deemed likely with current subsistence demands, yet with current levels of returning Chinook, pressure from commercial fishermen to open a directed commercial fishery has been mounting. This has resulted in a proposal addressing a directed Chinook fishery for consideration by the BOF at the 2007 AYK meeting.

Kuskokwim Bay Tributaries

The 2006 Chinook salmon escapement into the Goodnews River was well above average, and the parental escapements of 2002 and 2003 were average and are expected to provide a surplus beyond escapement requirements and provide opportunity for commercial, subsistence, and sport fishing. Commercial Fisheries Division has been operating an escapement weir since 2002 on the Kanektok River to enumerate salmon escapement. The weir is located more than 40 miles upstream and therefore counts only salmon that pass the weir during their spawning migration. The escapement in the lower 40 miles of the Kanektok River is estimated during the aerial survey. Perhaps in the future a telemetry project can be implemented to assess the spawning contribution downstream of the weir. The department is not proposing any changes to the Chinook salmon fisheries of Kuskokwim Bay.

Coho Salmon Fishery Description

Overview

Coho salmon are present in the majority of area streams and are caught and harvested in tributaries of the Kuskokwim Bay and tributaries of the lower Kuskokwim River. There is a large commercial harvest of coho salmon in the Kuskokwim River, in the last 20 years the

commercial harvest has ranged from 130,800 in 1997 to record harvest of 937,300 coho salmon in 1996 (Table 12). The historic commercial harvest has averaged approximately 450,000 coho salmon in the Kuskokwim River. The largest coho salmon sport fisheries in the area are located in the Kanektok and Aniak rivers. These two sport fisheries average approximately 6,700 and 2,500 angler days of effort, respectively, for all fish species.

The Kuskokwim River and its tributaries contain large runs of coho salmon. The stream characteristics are typically broad channels and turbid water thereby reducing the sport fishing largely to clear water tributaries. These sport fisheries attract a very small number of anglers to western Alaska.

Historical Perspective and Fishery Management

Sport harvests and effort are estimated through the SWHS and reported by Mills (-1994), Howe et al. (1995, 1996, 2001a-d), Walker et al. (2003), and Jennings et al. (2004, 2006 a-b, *In prep a-b*). Commercial and subsistence harvests are managed by the Commercial Fisheries Division located in Bethel and are reported in their Annual Management Report series (Burkey et al. 1997-2001, Ward et al. (*In prep*), Whitmore et al. (2005), Linderman (2005). The Kanektok River has the most complete commercial, subsistence, sport harvest and escapement information on coho salmon in the area (Table 13). Sport Fish Division has monitored both the Kanektok and Aniak with additional in-season harvest surveys and stock assessment projects in the past (Minard 1987, Minard and Brookover 1988; Dunaway and Bingham 1992, Dunaway and Fleischman 1995, Dunaway 1997 and Lafferty and Bingham 2002). Additionally, the U.S. Fish and Wildlife Service from the Togiak Refuge has collected age and size data from coho salmon spawning in the Kanektok since 1994 (Lisac and MacDonald 1995 and MacDonald 1996).

ADF&G has focused on assessing salmon escapements and harvests through several programs in the Kuskokwim area. Harvest monitoring is conducted through fish tickets and surveys designed to estimate harvests from subsistence and sport fisheries. Salmon escapement is monitored through aerial surveys, sonar, test fishing and weirs in the Kuskokwim drainage. The primary coho salmon escapement programs in the Kuskokwim are aerial surveys, and Kogrukluk weir. The Bethel test fishery only provides indices of daily passage. Recent weir projects in the Kwethluk, Tuluksak, George, Kogrukluk, Tatlawiksuk, and Takotna and the Salmon rivers have been added to escapement assessment of the area. There is consideration for more weir operations in the future. Additionally, mark-recapture methods have been used on the mainstem of the Kuskokwim River utilizing fish wheels to capture coho salmon upstream of Kalskag since 2001.

Escapements of coho salmon in the Kuskokwim are monitored either with weir operations or aerial surveys from fixed wing aircraft. Aerial survey counts are unexpanded indices and represent minimum escapements. There are only a few escapement objectives for coho salmon in this area, and weather conditions seldom allow reliable aerial surveys to be flown to index coho salmon escapements. However, salmon escapement or weir projects in recent years are improving the department's ability to enumerate coho escapement (Molyneaux et al. 2005) and begin the process to develop escapement objectives in accordance with the department's Escapement Goal Policy.

Sport harvests of coho salmon are very small in comparison to the commercial and subsistence harvests in the area (Tables 12–14). However, angler desire to participate in the coho fisheries is great. The average angler stay in western Alaska for fishing is at least six days which equates to

approximately 3,000 anglers in the entire area. Approximately 1,700 anglers participate in all the sport fisheries in tributaries of the Kuskokwim Bay and 1,300 anglers participating in the sport fisheries in the tributaries of the lower Kuskokwim River. Overall, 3,000 anglers are harvesting 3,000 coho salmon and catching and releasing approximately 40,000 coho salmon (Tables 15 and 16). Delayed mortality has been a concern in some coho fisheries within the state; however, these coho fisheries are near estuarine waters. Most of the anglers participating in the Kuskokwim area are on float trips in tributary headwaters, and furthermore these headwaters have special management regulations to protect rainbow trout, with unbaited single-hook, artificial lures. Accepting that delayed hooking mortality is minor 5% or less (Bendock and Alexandersdottir 1992), the overall harvest of coho salmon contributed to the area sport fisheries is approximately 5,000 coho salmon. Area sport harvests of coho salmon are insignificant to the commercial and subsistence harvests.

Historically, daily bag limits for coho salmon were very liberal in 1986, allowing 15 fish per day, 30 fish in possession. In 1987, the Board recognized the significance of the harvest potential of the Kanektok sport fishery and reduced bag and possession limits to 5 fish daily. These bag limits remained the standard for most of the area, except recent changes in the Aniak River. The liberal bag and possession limits were adopted to accommodate subsistence fishers who were using rod and reel for subsistence purposes, but were required to purchase a sport fishing license. Repeatedly, harvest surveys conducted on the Kanektok River indicate that sport anglers rarely (7-15%) had taken a full bag limit of coho salmon and most of the anglers (61-66%) elected to take no fish, even though 95% of them had caught and released a fish (Dunaway and Bingham 1992, Dunaway and Fleischman 1995).

Concerns from the Central Kuskokwim Advisory Committee prompted the BOF to create the Aniak River Salmon Management Plan out of the regular 3-year cycle during the March 2000 meeting. This temporary plan was a series of species-specific regulations restricting bag / possession limits and implementing catch-and-release for chum and coho salmon with a sunset clause. During the period of May 1 through August 31 only one coho salmon may be harvested above the Buckstock River and chum salmon may not be possessed year-around in this section of the Aniak River. The Aniak Management Plan became the most restrictive remote fishery within the State of Alaska. The sunset clause attached to the Aniak Management Plans required the BOF to review this set of regulations during the January 2001 meeting. Members of the public and sport fishery industry indicated that these temporary regulations were far too restrictive, a compromise set of regulations were accepted based on an aggregate daily bag limit. Aggregate daily bag limits were consistent with the subsistence regulations of the Aniak River, however, subsistence possession limits were more generous. Anglers were allowed up to three (3) coho salmon a day in the Aniak River, in all other locations of the Kuskokwim anglers were allowed a daily bag limit of five (5) coho salmon.

Current coho salmon regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Aggregate salmon bag limit of three, up to three coho salmon a day, no size limit.

Kisaralik, Kasigluk, and Kwethluk River

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Bag and possession is five coho salmon a day, no size limit.

Holitna River and the remaining waters of the Kuskokwim River drainage

- Bag and possession is five coho salmon a day, no size limit.

Current Kuskokwim Bay coho salmon regulations:

Kanektok and Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- Bag and possession is five coho salmon a day, no size limit.

Arolik River and remaining waters of Kuskokwim Bay

- Bag and possession is five coho salmon a day, no size limit.

Summary of 2004 and 2005 seasons

Coho salmon abundance in 2004 was above average overall (Whitmore et al. 2005). The Bethel Test Fishery cumulative catch index was amongst the strongest on record since the initiation of the project in 1984, and cumulative passage at key weirs were near record averages. Some weirs in the upper part of the Kuskokwim drainage were reported to have average returns.

In 2005, coho returned in a similar fashion, although again in the upper Kuskokwim there were lower returns of coho, with Takotna, Tatlawiksuk, and George River below average.

In both years, sport fishers reported average to good catches in the lower Kuskokwim and Kuskokwim Bay (Tables 12-16). Sport harvest was well above average in both years (Table 12), though still a tiny portion of overall harvest including subsistence and commercial uses. Harvest in the Holitna drainage was also well above average (Table 1). Catch rates remained similar and stable throughout the Kuskokwim Bay, Lower Kuskokwim, and Holitna drainages (Tables 1, 13-16).

Fishery Outlook and 2006 Season

Kuskokwim River

Recent trends in coho salmon production have provided surpluses for commercial and sport fisheries during the past 10 years. Coho salmon returns to the area have fluctuated during the last 5 years, with especially large returns in 2003 and 2004. Coho salmon return to the Kuskokwim area primarily at 4 years of age; the 2003 brood will be the main parent year for the 2007 return. The coho escapement assessment project in 2003 counted the second highest return ever, with 2004 even higher. If these coho escapements are any indication of coho returns to the Kuskokwim area, then the department could expect a better than average return to the area. Run strength is assessed by commercial fishery performance, test fishing and escapement assessment.

In 2006, coho salmon began entering the lower Kuskokwim River in mid July, with the bulk of the run arriving late according to most reports. Sport, subsistence, and commercial fishermen all reported not only late fish, but smaller size. Commercial Fisheries Division staff observed that the coho averaged about a pound lighter than previous years, based on commercial fish ticket information.

Sport fishing for coho salmon improved late in the season at many tributary confluences in the lower Kuskokwim. By mid-August, fishing opportunities were being reported as average in the lower reaches of Kuskokwim tributaries. Coho abundance at escapement weirs tracked near average. Most escapement weirs counted average numbers of coho salmon during the remainder of their operations in 2006.

The coho entry patterns in the Kuskokwim Bay were similar to the Kuskokwim River. After initial complaints of a lack of coho, the absence was attributed to late run timing. Sport fish guides in Kuskokwim Bay noted a preponderance of smaller coho. Sport fishing opportunities were characterized as low to average during the months of August and September in Kuskokwim Bay streams.

Chum Salmon Fishery Description

Overview

Kuskokwim chum salmon stocks are primarily harvested for subsistence and commercial uses. There has been a long history of subsistence use of chum salmon in the Kuskokwim river; chum salmon were documented as being used for subsistence in 1922 (Burkey et al. 2000). In the past, the subsistence fishery has had few restrictions and most of the harvest has been taken using gillnets, either drift or set net. Directed commercial fishing for chum salmon in the Kuskokwim River started in 1971. In 1983 escapement based-management began in the Kuskokwim River. This fishery continued and expanded with a record harvest of 1.4 million in 1988 (Table 17). Since then, harvests declined to less than 100,000 in the mid 1990s and more recently to less than 100,000 chum salmon. During the last few years, the chum harvest has been incidental to the harvest of coho salmon in the Kuskokwim. The harvest of chum salmon is also incidental to the directed commercial fisheries for sockeye salmon in Kuskokwim Bay.

Sport harvests of chum salmon are tiny in comparison to subsistence and commercial harvests (Table 17). There is active angler participation in the chum salmon fishery. Approximately 3,000 anglers are harvesting 200 chum salmon and catching and releasing 12,000 chum salmon (Tables 1, 2, 18, 19). There is very little hooking mortality because many of the anglers are on float trips in tributary headwaters, and furthermore these headwaters have special management regulations to protect rainbow trout (i.e., unbaited single-hook, artificial lures). Accepting that delayed hooking mortality is minor, less than 5%; the overall removal of chum salmon is less than 1,500 fish in sport fisheries of the Kuskokwim Area.

Historical Perspective and Fishery Management

Chum salmon escapement goals were established in 1983 for several Kuskokwim River tributaries based on average observed escapements, since 1960. Escapement-based management assumes that providing adequate numbers of spawners will produce sustainable yields of salmon and return salmon runs to historic levels. As the department's knowledge on stock specific production increases, refinements can be made to provide sustainable yields.

The department has focused on assessing salmon escapements and harvests through several programs in the Kuskokwim Area. Harvest monitoring is conducted through fish tickets and surveys designed to estimate harvests from the subsistence and sport fisheries. Salmon escapement is monitored through aerial surveys, sonar, test fishing and weirs in the Kuskokwim drainage. In the past, the primary method of assessing chum salmon escapement in the Kuskokwim was by aerial survey. With the addition of several weirs to the area and the existing Aniak Sonar and Bethel test fishery, aerial surveys have been phased out as an index method.

Exceptionally poor runs of Kuskokwim River drainage chum salmon in 1993 and 1994 resulted in extensive restrictions in the sport and commercial fisheries. The sport harvest of chum salmon was prohibited by EO during 1993 and reduced to a bag limit to one chum salmon per day in 1994. In 1997, on July 10, an EO closed sport fishing (including catch-and-release) for chum salmon in the Kuskokwim drainage for the remainder of the 1997 season.

In March of 2000, the BOF created two Aniak River management plans, one for salmon and one for resident fish. The Aniak Salmon Management Plan is a series of species-specific regulations restricting bag/possession limits and implementing catch-and-release for chum and coho salmon. Chum salmon may not be possessed year-round. During the period of May 1 through August 31 only one coho salmon may be harvested above the Buckstock River. However, the mechanics of implementing this management plan became complex because emergency regulations are only valid for 180 days and the change in bag/possession limits was greater than 180-day limit. With concurrence from the BOF, a permanent regulation was created with a sunset clause. This sunset clause requires the BOF to address this regulation at every 3-year scheduled meeting with or without a proposal addressing this regulation. The regulation became effective on May 9 and expired on December 31, 2000.

During the BOF meeting in 2001, members of the public and sport fishery industry indicated that these temporary regulations were far too restrictive; a compromise set of regulations were accepted based on an aggregate daily bag limit. Aggregate daily bag limits were consistent with the subsistence regulations of the Aniak River; however, subsistence possession limits were more generous. The sport fishery for chum salmon in the Aniak River remained no-retention, allowing catch-and-release fishing.

Current chum salmon regulations:

Aniak River

- In all flowing waters of upstream of Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- No retention or possession, year-round. All chum salmon must be released immediately.

Kisaralik, Kasigluk, and Kwethluk River

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Bag and possession limit is five chum salmon a day, no size limit.

Holitna River and remain waters of the Kuskokwim River drainage

- Bag and possession limit is five chum salmon a day, no size limit.

Current Kuskokwim Bay chum salmon regulations:

Kanektok and Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- Bag and possession limit is five chum salmon a day, no size limit.

Arolik River and remaining waters of Kuskokwim Bay

- Bag and possession limit is five chum salmon a day, no size limit.

Summary of 2004-2005 Seasons

Following the Kuskokwim Salmon Rebuilding Plan, the subsistence schedule was implemented on June 1 in the lower Kuskokwim. Additionally, in 2004, the sport fishery in the Kuskokwim was limited by EO to a bag and possession limit of one Chinook or one chum salmon (Appendix A).

In 2004, acting in caution because of the weak strength of the parent years, there was an EO to reduce the bag and possession limit of chum to one. It became apparent early on that chum salmon were coming back to the Kuskokwim in better numbers than in recent years. Chum salmon abundance at Kuskokwim River run assessment projects was above average overall. The Aniak River sonar chum salmon index exceeded the upper end of the escapement goal range. Chum at the Kogrukluk River weir surpassed the lower end of the escapement goal range (Whitmore et al. 2005).

In 2005, the Bethel Test Fishery had the highest index for chum since the project was initiated in 1984. In neither year was it necessary to restrict the fishery beyond the ordinary bag limits by means of an EO. Importantly, in 2005 and subsequently in 2006, the Aniak sonar project and Kogrukluk River weir on the Holitna system exceeded the upper end of their escapement goals (Linderman 2005).

Fishery Outlook

Kuskokwim/Kuskokwim Bay

Recent trends in chum salmon production have provided large surpluses for commercial and sport fisheries in the past 3 years. The chum salmon harvests in the commercial fisheries in Kuskokwim Bay are incidental to directed fisheries at Chinook, sockeye and coho salmon. In the Kuskokwim River proper, ostensibly a chum fishery, large catches of chum in relation to the more commercially valuable species will often shut down the commercial fishery due to lack of processing capacity. Commercial harvests of Kuskokwim chum salmon generally declined from harvests that occurred in the 1980s, first due in part to shortage in the late 1990s, and now largely due to low market demand: during the recent record chum returns, chum have not been actively sought after.

Considering the large numbers returning in 2004 and 2006, and the record numbers in 2005, the outlook for chum salmon in the Kuskokwim is above average and the department will pursue removal of these stocks from stock of yield concern status.

Sockeye Salmon Fishery Description

Overview

Sockeye salmon are present in the Kuskokwim drainage, but are more plentiful in Kuskokwim Bay tributaries. As with other Pacific salmon, sport harvests are small and minor in comparison to the commercial and subsistence harvest of the area (Table 20). Commercial fisheries of Kuskokwim Bay target sockeye salmon during late June through mid July. The average sockeye harvest in the commercial fisheries is greater than 60,000 and 40,000 fish, respectively for the Quinhagak and Goodnews districts (Burkey et al. 2001). Recreational sockeye catches in the Kanektok and Goodnews rivers are a few thousand and harvests are less than 500 sockeye annually in Kuskokwim Bay streams. Only during 1998 and 1999 did the recreational harvest of sockeye salmon in Kuskokwim Bay streams exceed a thousand fish (Table 21). Rarely does the sport harvest of sockeye salmon in the Kuskokwim drainage exceed 200 fish with catches less

than 500 sockeye a year (Table 22). Sockeye catches and harvests in the sport fisheries of Kuskokwim Bay tributaries are negligible in comparison to the commercial and subsistence harvests of sockeye salmon.

Historical Perspective and Fishery Management

The sockeye salmon stocks of the Kanektok and Goodnews rivers are the largest in the Kuskokwim area. Sockeye stocks of the Kuskokwim River are relatively small and located sporadically throughout the drainage, with the largest occurring in the Holitna drainage (S. Gilk, CF Biologist, ADF&G, Anchorage; personal communication). Most anglers venturing to western Alaska are interested in Chinook and rainbow trout opportunities; however, sockeye and coho salmon opportunities have been becoming increasingly important to recreational anglers. Anglers seeking sockeye fishing opportunities in the Kanektok and Goodnews rivers focus their efforts during the month of July prior to the Chinook spawning season closure of July 25. Sport harvests and effort are estimated through the SWHS reported by Mills (1983-1994), Howe et al. (1995, 1996, 2001a-d), Walker et al. (2003.), and Jennings et al. (2004, 2006 a-b, *In prep a-b*). Commercial and subsistence harvests are managed by the Commercial Fisheries Division located in Bethel and are reported in their Annual Management Report series Ward et al. (*In prep*) and Whitmore et al. (2005).

Sockeye management of Kuskokwim Bay is outlined under the District 4 Salmon Management Plan (5 AAC 07.367 2004), sockeye management in Goodnews Bay, district 5 follows a similar regulation pattern, although there is no formal management plan (Ward et al. *In prep*; Whitmore et al. 2005). Escapement based management has been challenging in Kuskokwim Bay. In the past, escapements have been evaluated by aerial surveys, however, multiple salmon species and frequent poor survey conditions has made documenting salmon escapements difficult. Finding different methods of assessing salmon escapements has not been an easy task, within the Kanektok, towers and sonar have been attempted, but water conditions, technical support staff and budgetary constraints have limited salmon enumeration effectiveness. However, a weir using resistance board design has been successful during the last two (2) years; unfortunately, the weir site is 42 miles upstream from the mouth and the commercial fishery. This weir site appears to be functional, but additional assessment will need to be done to evaluate the escapement spawning downstream of the weir. The Goodnews River weir is located 15 miles upstream of the mouth and commercial fishery on the middle fork and represents an index of salmon escapement into the entire drainage, however, aerial surveys are still used to estimate salmon escapement other tributaries in the Goodnews drainage. Additional salmon assessment has been conducted to evaluate the contribution of salmon escapement in the mainstem of the Goodnews River in relation to index counts from the weir (Menard 1998 and 1999; Estensen 2003). Salmon escapement objectives for the Goodnews River were established in 1992 (Buklis 1993) at 25,000 sockeye salmon by either tower or weir counts in the middle fork of the Goodnews River, along with aerial survey indices of the main fork and lakes with escapement objective of 15,000 sockeye salmon. Kanektok River aerial escapement objective for sockeye salmon is 15,000 fish. Successful aerial surveys counting salmon escapement in the Kanektok and Goodnews Rivers have been dismal historically, very few surveys were conducted during peak spawning, this has made escapement-based management problematic. However, commercial fisheries management has followed a simple fishing schedule based on fishery performance in relation to the historic mean CPUE of the commercial fishery and this has worked to provide sustained yields. The recent declining profitability of commercial fishing in

the area has aided to the reduced harvests in the Quinhagak and Goodnews commercial fishing districts.

Current sport regulations for Kuskokwim sockeye salmon:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Aggregate salmon bag limit of three, up to three coho salmon a day, no size limit.

Kisaralik, Kasigluk, and Kwethluk River

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Bag and possession limit is five sockeye salmon a day, no size limit.

Holitna River and the remainder of the Kuskokwim River drainage

- Bag and possession limit is five sockeye salmon a day, no size limit.

Current Kuskokwim Bay sockeye salmon regulations:

Kanektok and Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- Bag and possession limit is five sockeye salmon a day, no size limit.

Arolik River and remainder of the Kuskokwim Bay waters

- Bag and possession limit is five sockeye salmon a day, no size limit.

Summary of 2004 and 2005 Seasons

The 2004 sockeye season was generally characterized as average by Lower Kuskokwim and Kuskokwim Bay sport fishers, though the subsistence and commercial catches were high (Tables 20,21, 22). Most sockeye catches are incidental to other sport fisheries (notably Chinook and rainbow trout) in the Kuskokwim Bay streams (Table 23).

Similarly to the chum salmon, the Bethel Test Fish cumulative index for sockeye salmon in 2005 was the largest since the inception of that fishery as an index in 1984. Sport fishers (especially in Kuskokwim Bay streams) characterized the fishery as very good. Still, catch and harvest for sockeye salmon remained low in the sport fishery, primarily because they aren't targeted exclusively in most Kuskokwim and Kuskokwim Bay streams as they might be in the sockeye-rich streams of Bristol Bay.

Fishery Outlook-Lower Kuskokwim and Kuskokwim Bay

Though the fish showed up late according to subsistence, sport, and commercial users, the 2006 season showed a strong return of sockeye to the Kuskokwim and Kuskokwim Bay. This was in addition to the previous strong years in 2004 and 2005. With three strong near-record years of returns, it is difficult to predict whether this will continue in full strength, but all indications are that the sockeye returns for 2007 will likely remain above average.

RESIDENT SPECIES FISHERIES

Rainbow Trout Fishery Description

Overview

Rainbow trout of the LYLK are found only in the lower Kuskokwim River tributaries and tributaries of Kuskokwim Bay. These stocks of rainbow trout are at the northern range of their geographic distribution. Many of these rainbow trout stocks in the Kuskokwim area are small, slow growing, mature at older age and are not particularly abundant. With any population on the edge of its distribution, it is more sensitive to changes in climatic changes and food availability. The Southwest Alaska Rainbow Trout Management Plan (ADF&G 1990) recognizes these factors and provides policy for conservative management and maintenance of rainbow trout stocks in the lower Kuskokwim River and Kuskokwim Bay.

Rainbow trout stocks of the Kanektok River are considered "world class" with notoriety for high catch rates; the peak catch of 27,000 rainbow trout occurred in 1997. The most current 5-year average shows approximately 8,000 rainbow trout per year, with virtually no harvest being reported during 2003-2005 (Table 25). Rainbow trout catch rates from the Kanektok River rival those of the premier rainbow trout stocks of Alagnak and Copper rivers of Bristol Bay and the trophy rainbow trout area on the Kenai River, between Kenai and Skilak lakes. The Kanektok River is the largest rainbow trout fishery in the Kuskokwim Bay and lower Kuskokwim River. Recently, angling effort in the Kanektok has declined to below 6,000 angler days (Table 7), from the stable levels of 7,000 to 9,000 angler days since 1996. Overall, the rainbow trout catch in Kuskokwim Bay drainages has remained steady in the last 5 years, ranging from 7,000 to 8,000. The sport fishing industry continues to report good catches and rainbow trout across all size categories.

Historical Perspective and Fishery Management

Combining salmon and rainbow trout fishing is probably one of the major attractions to worldwide anglers to the Kuskokwim area. Area rainbow trout stocks are extremely important to the people of the state and to the recreational and tourism based services that contribute to the state's economy.

Angler effort in all sport fisheries of the Kanektok River has seen a rapid increase from 1,500 angler days in 1983 to over 12,000 angler days in 1988 (Table 5). Since 1988, the effort has fluctuated from 3,000 to 9,000 and most likely reflects the availability of guiding services. In recent years, angler effort has declined slightly, with approximately 7,600 angler days in the Kanektok, and about 3,600 in the Goodnews River. Angler effort in the Aniak River sport fisheries was greater than 5,500 during 1997 and 1998 but has remained at about half of this level from 2001-2005. Angler effort in the Aniak is directed primarily towards Chinook and coho salmon but rainbow trout are an important attraction.

Total area-wide rainbow trout sport harvests have rarely exceeded 1,500 fish as seen in 1988, and the recent 5-year average is less than 400 rainbow trout (Tables 23 and 24). Several on-site creel surveys in the Kanektok and Aniak rivers have been done to verify catch, harvest and angler effort (Lafferty and Bingham 2002; Adams 1996; Dunaway 1997; Dunaway and Feischman 1995; Dunaway and Bingham 1992; Wanger 1991; Minard 1990; Minard and Brookover 1988; Minard 1987; Alt 1986). Emphasis of these studies were on the sport fisheries that included rainbow trout fisheries as part of the study except the study by Wanger (1991).

Wanger attempted to estimate rainbow trout using a mark-recapture experiment, although several of the assumptions were invalid and a biased population estimate of 15,000 to 20,000 rainbow trout was obtained for a 32-kilometer study section. Expanding this information to a drainage wide estimate, the abundance of Kanektok rainbow trout was estimated to be in the range of 40,000 to 80,000 fish in 1986 and 1987.

Another tagging study of Kisaralik River rainbow trout in 1997 by the U.S. Fish and Wildlife Service estimated the rainbow trout population to be in excess of 16,000 rainbow trout in a 79-km study section (K. Harper, Biologist, U.S. Fish and Wildlife Service, Kenai; personal communication). The rainbow trout density estimates range from 200-rainbow trout/km in the Kisaralik River to 650-rainbow trout/km in the Kanektok River. Although these mark-recapture experiments were flawed because of the egress and migration of tagged fish within the study site, the density estimates are a rough approximation of density and provides confidence that existing catches by SWHS are sustainable. Area rainbow trout stocks continue to be conservatively managed.

Sport fishing effort, catch, and harvest are estimated by the SWHS (Howe et al. 1995, 1996, 2001a-d; Jennings et al. 2004, 2006 a-b, *In prep a-b*; Mills 1979–1994; Walker et al. 2003). In the past, subsistence harvest surveys have focused on salmon in the LYLK, but in 2000 the Subsistence Division began to estimate resident fish harvests, including rainbow trout on a community basis. Commercial Fisheries Division manages all of the subsistence fisheries.

Rainbow Trout Regulation Development in the Kanektok River

In 1969, the fishing season was open year-round with a daily bag limit of 15 fish (including rainbow trout) of which not more than 3 could exceed 20 inches in length.

In 1985, the rainbow trout bag limit was reduced to 2 per day, with no size limit.

In 1990, single-hook, artificial lures were required upstream of the Togiak National Wildlife Refuge boundary. Sport fishing was prohibited within 300 feet of legally set subsistence gillnets.

In 1998, the entire river was restricted to unbaited, artificial lures, the entire year. During the period of June 8 through October 31, catch-and-release for rainbow trout. From November 1 through June 7 daily bag and possession limit is 2 rainbow trout, with only one 20 inches or longer.

Rainbow Trout Regulation Development in the Lower Kuskokwim River Tributaries

During the mid 1980s bag limits were adopted in the Kuskokwim area to eliminate excessive harvests. Bag limits at this time were very liberal providing opportunity for local people to meet their subsistence needs. During the February 1990 BOF meeting, the Board adopted regulations implementing a comprehensive management plan for rainbow trout in Southwest Alaska (ADF&G 1990). The plan provides guidance in the form of policy that gives the Board and the public clear understanding of the underlying principles by which rainbow stocks are to be managed and provides guidance to the board in developing future regulations.

This management plan has three primary aspects:

1. Native rainbow trout populations will be managed to maintain historic size and age composition and at stock levels sufficient such that enhancement (or stocking) is not needed to supplement wild populations;

2. A diversity of sport fishing opportunities for wild trout should be provided through establishment of special management areas by regulation. Selection of areas for special management will be based on criteria to be adopted by the BOF. Selection criteria is inclusive of the following: stock status, history of special management, proximity to local community, legal access, overlap with freshwater net fisheries, abundance and size of rainbow trout, water characteristics, clear geographical boundaries, importance of the rainbow trout fishery to sport fishing industry, geographical distribution of special management; and,
3. Management strategies should be consistent with prudent economical development of the state's recreational sport fishing industry while at the same time acknowledge the intrinsic value of this fishery resource to the people of Alaska.

Implementation of this plan:

e) Expanded the Wild Trout Zone from the Iliamna drainage to include the drainages of Bristol Bay, Kuskokwim Bay and lower Kuskokwim River including the Aniak River drainage;

f) Establish eight catch-and-release areas;

g) Establish six fly-fishing catch-and-release only areas; and,

h) Establish eleven unbaited, single-hook, artificial lure only areas to protect rainbow trout stocks in Southwest Alaska.

In 1990, the Aniak River drainage (Figure 2) was affected by the designation of a catch-and-release special management area with unbaited, single-hook, artificial lure restrictions above its confluence with the Doestock River to protect rainbow trout.

Aniak River

- Upstream of the Doestock Creek (at approximately river mile 12) only unbaited, single-hook, artificial lures may be used. No retention of rainbow trout.
- Downstream of the Doestock Creek, two rainbow trout a day, with only 1 20 inches or longer.

During 1997, upper sections of the Kisaralik, Kwethluk, and entire length of the Kasigluk rivers were recognized as special rainbow trout waters following the Southwest Alaska Rainbow Trout Management Plan (ADF&G 1990) allowing the use of only unbaited, single-hook, artificial lures.

During the 2000 March BOF meeting, a subsistence rod and reel provision was adopted in the AVCP region of the Yukon–Kuskokwim Delta area. A result of this rod and reel subsistence provision was that all sport fishing regulations in the AVCP region apply only to nonresident anglers. All Alaskan residents are considered subsistence users under state statues and there were no bag or possession limits for subsistence users utilizing rod and reel, except for rainbow trout. Local residents of the village of Aniak were concerned with this change and sought additional protection in the Aniak River. A temporary Aniak River Subsistence Management Plan was created and the regulations mirrored the sport fishing regulations. The first subsistence catch-and-release fishery was created in the Aniak River. This temporary plan had a sunset clause for 1 year; the BOF addressed this plan during the January 2001 meeting.

During the January 2001 BOF meeting additional regulations were adopted to protect lower Kuskokwim rainbow trout in the sport fishery. Catch-and-release regulations are currently in effect for the entire Aniak River drainage sport fishery, gear restrictions remain in effect upstream of Doestock Creek. The lower Kuskokwim tributaries of the Kasigluk and Kwethluk rivers have consistent rainbow trout regulations. The bag and possession limit was reduced from two a day, with only one over 20 inches in length to one a day less than 14 inches in length, to protect mature spawning fish in the designated reaches of these streams. The downstream section below the Akiak Lodge site on the Kisaralik was also include in this management regime to provide consistent rainbow trout regulations for the area.

Current Kuskokwim rainbow trout regulations:

Aniak River

- In all flowing waters of the Aniak River drainage, only unbaited, single–hook, artificial lures may be used. No retention of rainbow trout.

Kisaralik River

- Upstream of Akiak Village Lodge Site (at approximately river mile 12) only unbaited, single–hook, artificial lures may be used. No retention of rainbow trout.
- Downstream of the Akiak Village Lodge Site (at approximately river mile 12) The bag and possession limit is 1 fish, 14 inches or less in length.

Kasigluk River

- In all flowing waters, only unbaited, single-hook, artificial lures may be used.
- The bag and possession limit is 1 rainbow trout, 14 inches or less in length.

Kwethluk River

- In all flowing waters upstream of the confluence of the Kwethluk River and Pocahontas Creek (approximately river mile 25) only unbaited, single-hook, artificial lures may be used.
- The bag and possession limit is 1 rainbow trout, 14 inches or less in length.

Remainder of the Kuskokwim River drainage:

- The bag and possession is two rainbow trout a day, with only one greater than 20 inches in length.

Current Kuskokwim Bay rainbow trout regulations:

Kanektok River

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- June 8 – October 31, only catch-and-release, no retention of rainbow trout.
- November 1- June 7, the bag and possession is two rainbow trout a day, with only one greater than 20 inches in length.

Goodnews River

- In all flowing waters, only unbaited, single-hook, artificial lures may be used.
- The bag and possession is two rainbow trout a day, of which only one greater than 20 inches in length.

Arolik River and the remaining waters of Kuskokwim Bay

- The bag and possession is two rainbow trout a day, with only one greater than 20 inches in length.

Summary of 2004 and 2005 Seasons

In 2004, low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. These conditions worsened during late June with moderate levels of precipitation during July again reduce fishing conditions. Many of the high altitude lakes were ice-free during late June providing access to most of the area's float trip drop-off locations. Local anglers reported good-to-excellent catches of rainbow trout in Kisaralik River and good catches in the Aniak River. Dependent on fishing conditions, sport fishing reports on both the Kanektok and Goodnews river rainbow trout fisheries were rated as average to good through the summer months.

In 2005, low rainfall and sunny conditions beginning in May produced low water conditions ideal for rainbow trout catch throughout most of the summer in both Kuskokwim River and Kuskokwim Bay drainages. Catches were reported to be better than average at most Kuskokwim Bay/Lower Kuskokwim locations. Beginning in late July, conditions deteriorated somewhat due to rain with high, turbid water and catches were reported to be low or below average in most locations.

Fishery Outlook

The rainbow trout stocks of the Kuskokwim area provide high catch rates and low harvest rates; strong indicators of healthy fish populations. Local anglers and the guiding industry continue to provide positive comments on the rainbow trout stocks. Some concerns have been raised about rainbow trout stocks on the Aniak River. The outlook for rainbow trout stocks in the Kuskokwim area is generally good. Rainbow trout greater than 25 inches are occasionally caught. In the short term the impacts of the rod and reel subsistence fishing appear to be minor, but resident fish populations rebuild slowly, particularly on the their distribution boundary.

A wild/steelhead trout initiative began in October of 2001. This initiative focuses on:

- adequate water for rainbow trout movement, rearing and spawning;
- protecting critical habitat and water quality;
- adequate food supplies (e.g., insects, salmon spawn/flesh and stream organisms);
- gear that reduces injury and mortality (e.g., hooks are single and barbless);
- secure funding for agencies through establishing a wild trout stamp; and,
- establish catch-and-release, single-hook, artificial lure only regulations as a default for directed rainbow trout fisheries statewide with allowances for traditional and customary harvests and other special management options (fly-fishing only waters).

Results of this initiative culminated in the development of the statewide rainbow trout regulations (5 AAC 75.220, 2003) that merge with existing regulations for rainbow trout stocks not under special management. There are currently no major biological concerns for rainbow trout fisheries in the Kuskokwim and Kuskokwim Bay. With close attention to sport and subsistence harvests to ensure the health of local stocks, area stocks should continue to provide good angling opportunities for the 2007 season and beyond.

Dolly Varden/Arctic Char Fishery Description

Overview

Dolly Varden/Arctic char, hereafter referred to as DV/AC, of the Kuskokwim are found throughout the region. The distribution of both Dolly Varden and Arctic char overlap in this area of Alaska, and it is potentially difficult to differentiate between the species. Populations of Dolly Varden are both anadromous and freshwater resident. Arctic char are primarily lake residents in this part of Alaska. The distributions and external characteristics of these species make identification a challenge. For management purposes this closely related species are treated as a composite.

Anglers focusing on DV/AC target mainly the clear water tributaries and lakes of the area. Within the Kuskokwim Management Area, the largest catches of DV/AC occur in the tributaries of Kuskokwim Bay and the Aniak River. Many of the DV/AC are caught incidentally while anglers are fishing for salmon and rainbow trout. The regulations in place to protect rainbow trout also protect other resident fish species such as DV/AC. With catches generally exceeding 15,000 DV/AC, the Kanektok River is the largest fishery in the Kuskokwim Bay and lower Kuskokwim River (Table 23). Goodnews and Aniak river DV/AC fisheries are the next largest sport fisheries in the area (Tables 25 and 26). These three fisheries are of primary interest to the angling public; angling services have increased in recent years as each of these streams gains increasing popularity. Local residents seek DV/AC when salmon are not available as a fresh source of fish. Stock sizes of DV/AC in the Kuskokwim remain unknown.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS, estimates from the annual report are reviewed to ensure that sport harvests remain with sustainable yields. Sport fishing regulations are developed to match effort and harvest within sustainable bounds. Current regulations and harvests appear to be within sustainable levels for DV/AC of the Kuskokwim. High catches with low harvests are good indications of healthy fish stocks. Additionally, the low harvest rates are not an indicator of depressed fish stocks but of an under-utilized resource. Declining sport harvests of DV/AC from the early 1980s to the 1990s can be attributed to the additional protection from the Southwest Alaska Rainbow Trout Management Plan and changing attitudes of anglers regarding the harvest of DV/AC (Tables 25 and 26).

In March of 2000, the BOF created a temporary management plan for the resident species in Aniak River. This plan is a series of species-specific regulations restricting bag/possession limits and implementing catch-and-release utilizing time and area for grayling, DV/AC, pike, lake trout, sheefish, and whitefish. During the period of June 1 through August 31 all resident fish species caught above Doestock Creek must be released. Sport fishing regulations in the Aniak River downstream of Doestock Creek follow the special Kuskokwim River regulations. This

temporary plan had a sunset clause for 1 year; the BOF addressed this plan during the January 2001 meeting.

The only management action effecting DV/CA during the January 2001 BOF meeting occurred in the Aniak River with the establishment of aggregate bag limit for resident fish species for both subsistence (5 AAC 01.295, 2004) and sport (5 AAC 70.017, 2004) anglers. A six resident fish species limit was enacted for subsistence anglers during June, July and August. Sport anglers were restricted to an aggregate three resident fish limit, but only allowing one fish each of the following species: DV/AC, grayling, lake trout, sheefish, pike and burbot in any combination.

The 2004 BOF meeting reinstituted individual bag and possession limits for resident species in the Aniak.

Current Kuskokwim Dolly Varden/ Arctic char regulations:

Aniak River

- In all flowing waters upstream of Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- In flowing waters, the bag and possession limit is three fish, no size limit.

Kisaralik, Kasigluk, and Kwethluk River

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- In flowing waters, the daily bag and possession limit is five fish, only one of which may be over twenty inches long.
- Bag and possession limit in lakes is two a day.

Holitna River

- Bag and possession limit in flowing waters of the drainage is three Dolly Varden / Arctic char, no size limit.
- Bag and possession limit in lakes is two a day.

In all Kuskokwim waters downstream of the Holitna River

- In flowing waters, the bag and possession limit is five Dolly Varden / Arctic char, only one greater than 20 inches a day.

Remainder of the Kuskokwim River drainage:

- Bag and possession limit in flowing waters of the drainage is ten Dolly Varden / Arctic char/Lake trout, only two over 20 inches a day, only two may be Lake trout.
- Bag and possession limit in lakes is two Dolly Varden / Arctic char/Lake trout a day.

Current Kuskokwim Bay Dolly Varden / Arctic char regulations:

Kanektok and Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.

- In flowing waters, the bag and possession limit is three Dolly Varden /Arctic char a day, no size limit.
- In lakes, the bag and possession limit is two Dolly Varden / Arctic char a day, no size limit.

Arolik River

- In flowing waters, the bag and possession is three Dolly Varden / Arctic char a day, no size limit.
- In lakes, the bag and possession limit is two a day, no size limit.

Remaining waters of the Kuskokwim Bay

- In flowing waters, the bag and possession limit is five Dolly Varden / Arctic char a day, only one greater than 20 inches a day.
- In lakes, the bag and possession limit is two Dolly Varden / Arctic char a day, no size limit.

Summary of the 2004 and 2005 seasons

In 2004, low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. Rains during late June and moderate levels of precipitation during July again reduced fishing conditions. Many of the high altitude lakes were ice-free during late June providing access to most of the area's float trip drop off locations. Local anglers reported good catches of rainbow trout in Lower Kuskokwim and Kuskokwim Bay fisheries throughout the summer.

In 2005, low rainfall and sunny conditions beginning in May produced low water conditions ideal for Dolly Varden/Arctic char catches throughout most of the summer in both Kuskokwim River and Kuskokwim Bay drainages. Catches were reported to be average at most Kuskokwim Bay/Lower Kuskokwim locations. Beginning in late July, rainy conditions caused somewhat high, turbid water and catches were reported to be low or below average in most locations.

Fishery Outlook

The DV/AC stocks of the Kuskokwim area are well protected in the area sport fisheries with the current regulations. However, a reduction in allowable harvest of DV/AC greater than 18 inches would provide additional protection with the adoption of length limit for DV/AC. Overall, high catches rates with low harvests is a strong indicator of healthy fish populations. The outlook for DV/AC and other resident fish species in the Kuskokwim area is currently good. The department has invested substantial effort in regulation development to protect resident fish species.

There are currently no major biological concerns for DV/AC fisheries in the Kuskokwim Management Area. Area stocks should continue to provide good angling opportunities for the 2007 season.

Arctic Grayling Fishery Description

Overview

Arctic grayling are probably the most widely distributed and abundant resident fish in the Kuskokwim Management Area. Grayling are found throughout many lakes, streams and clear water tributaries of the area. Non-resident anglers access most of the area via float trips on the many of the clear water tributaries. Anglers typically catch grayling while targeting salmon and rainbow trout. Current sport fishing regulations for rainbow trout provide additional protection to other fish species with gear and hook restrictions in local tributaries. Recent grayling harvests in the Kuskokwim are about 500 fish (Tables 27 and 28). Recent sport catches are approximately 18,000 grayling. The Aniak River is the largest grayling fishery in the area, with the Kisaralik and Kanektok fisheries the next largest sport fisheries.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS, estimates from the annual report are reviewed to ensure that sport harvests remain within sustainable bounds. The focus of sport fishing regulations development is to enhance opportunity and maintain harvest within sustainable bounds. Current regulations and harvests appear to be within sustainable levels for Arctic grayling of the Kuskokwim. High catch rates with low harvests indicate healthy fish stocks. Additionally, the low harvest rates are not an indicator of depressed fish stocks but of an under utilized resource. The declining harvest rates of grayling from the early 1980s to the 1990s can be attributed to the additional protection of the regulation changes and changing attitudes of anglers regarding the harvest of grayling (Tables 27 and 28).

In March of 2000, the BOF created a temporary management plan for the resident species in Aniak River. This plan is a series of species specific subsistence and sport fishing regulations restricting bag / possession limits and implementing catch-and-release utilizing time and area for grayling, Dolly Varden/Arctic char, pike, lake trout, sheefish, and whitefish. During the period of June 1 through August 31 all resident fish species caught above Doestock Creek must be released. Sport fishing regulations in the Aniak River downstream of Doestock Creek; follow the special Kuskokwim River regulations. This temporary plan had a sunset clause for 1 year; the BOF addressed this plan during the January 2001 meeting.

During the 2001 January BOF meeting, both the subsistence and sport fishing bag and possession limits for resident fish in the Aniak River were enacted with the establishment of an aggregate bag limit. A six resident fish species limit was enacted for subsistence anglers during June, July and August. Sport anglers were restricted to an aggregate three (3) resident fish limit, but only allowing one fish of the following species: DV/AC, grayling, lake trout, sheefish, pike and burbot in any combination.

The 2004 BOF meeting reinstituted individual bag limits for resident species in the Aniak River.

Current Kuskokwim grayling regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Bag and possession limit is three grayling, no size limit.

Kisaralik, Kasigluk, and Kwethluk River

- Only unbaited, single–hook, artificial lures may be used in upper reaches for the entire drainage.
- Bag and possession limit in flowing waters of the drainage is five grayling a day, no size limit.

Holitna River

- Bag and possession limit in the drainage is two grayling, no size limit.

In all Kuskokwim waters downstream of the Holitna River.

- The bag and possession limit is five grayling a day, no size limit.

Remaining waters of the Kuskokwim River drainage

- Bag and possession limit is five grayling a day, no size limit.

Current Kuskokwim Bay Arctic grayling regulations:

Kanektok

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit is three grayling, no size limit.

Goodnews Rivers

- In all flowing waters only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit is two grayling, no size limit.

Arolik River

- The bag and possession is two grayling a day, no size limit.

Remaining waters of Kuskokwim Bay

- The bag and possession is five grayling a day, no size limit.

Summary of the 2004 and 2005 seasons

In 2004, low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. Rain during late June and moderate levels of precipitation during July again reduced fishing conditions. Many of the high altitude lakes were ice-free during late June providing access to most of the area's float trip drop off locations. Local anglers reported good catches of grayling in Lower Kuskokwim and Kuskokwim Bay fisheries throughout the summer.

In 2005, low rainfall and sunny conditions beginning in May produced low water conditions ideal for grayling catches throughout most of the summer in both Kuskokwim River and Kuskokwim Bay drainages. Catches were reported to be average at most Kuskokwim Bay/Lower Kuskokwim locations. Beginning in late July, rainy conditions caused high, turbid water and catches were reported to be low or below average in most locations.

Fishery Outlook

The grayling stocks of the Kuskokwim area are well protected with the current sport fishing regulations. A relatively high catch rate with low harvests is a strong indicator of healthy fish populations. There are currently no major biological concerns for grayling fisheries in the Kuskokwim. Area stocks should continue to provide good angling opportunities for the 2007 season.

Northern Pike Fishery Description

Overview

Most northern pike are harvested in lakes, streams and tributaries of within the Kuskokwim. Very few pike (less than 50) are being recorded through SWHS in the Kuskokwim Bay area. The largest pike sport fishery occurs in the Aniak River, however, there are a number of sloughs and unnamed lakes that provide pike fishing opportunities in the area (Table 29). Local anglers seek pike when salmon are not available as a fresh source of fish, mostly during the winter months. Most of the local Bethel subsistence effort is focused during the winter at the mouth of the Johnson River. Localized depletion is evident from repeated comments of only small "hammer handle" pike in the subsistence harvest. Stock sizes of pike in the Kuskokwim remain unknown.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS, estimates from the annual report are reviewed to ensure that sport harvests remain within sustainable bounds. The focus of sport fishing regulations development is to enhance opportunity and maintain harvest within sustainable bounds. Current harvests appear to be within sustainable levels for northern pike of the Kuskokwim. High catches with low harvests indicate healthy fish stocks. Additionally, the low harvest rates are not an indicator of depressed fish stocks but of low levels of use (Table 29). Annual sport harvests of pike have fluctuated in recent years, but harvests have remained very low (Table 29). The Kuskokwim River pike daily bag and possession limit is 10, with no size limit, except for the following: For those waters downstream of the Holitna to the mouth of the Kuskokwim River, the daily bag and possession limit is 5, with only one over 30 inches.

In March of 2000, the BOF created a temporary management plan for the resident species in Aniak River. This plan is a series of species specific subsistence and sport fishing regulations restricting bag / possession limits and implementing catch-and-release utilizing time and area for grayling, Dolly Varden/Arctic char, pike, lake trout, sheefish, and whitefish. During the period of June 1 through August 31 all resident fish species caught above Doestock Creek must be released. Sport fishing regulations in the Aniak River downstream of Doestock Creek follow the special Kuskokwim River regulations. This temporary plan had a sunset clause for 1 year; the BOF addressed this plan during the January 2001 meeting.

During the 2001 January BOF meeting, both the subsistence and sport fishing bag and possession limits for resident fish in the Aniak River were enacted with the establishment of an aggregate bag limit. A six resident fish species limit was enacted for subsistence anglers during June, July and August. Sport anglers were restricted to an aggregate three (3) resident fish limit, but only allowing one fish of the following species: DV/AC, grayling, lake trout, sheefish, pike and burbot in any combination.

The 2004 BOF meeting reinstituted individual bag and possession limits in the Aniak River.

Current Kuskokwim northern pike regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Daily bag and possession limit is five fish, no size limit.

Kisaralik, Kasigluk, and Kwethluk Rivers

- Only unbaited, single–hook, artificial lures may be used in upper reaches of the entire drainage.
- Bag and possession limit in flowing waters of the drainage is five pike a day, only one over 30 inches in length.

In all Kuskokwim waters downstream of the Holitna River including the Holitna River

- Bag and possession limit in the drainage is five pike, only one over 30 inches in length.

Remainder of the Kuskokwim River drainage

- Bag and possession limit is ten pike a day, no size limit.

Current Kuskokwim Bay Northern Pike regulations:

All waters of Kuskokwim Bay

- In all flowing waters of Kanektok and Goodnews River drainages only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit is five pike, only one over 30 inches in length.

Summary of recent seasons

There were no reported problems by anglers having difficulties locating northern pike during 2004 and 2005.

Outlook

There are no current biological concerns for the sport fisheries for northern pike in this area. However, an evaluation of the subsistence fishery at the mouth of the Johnson River should be conducted to investigate public comments regarding the small size of the pike harvested during the winter fishery. Other area stocks should continue to provide good angling opportunities for the 2007 season.

Sheefish Fishery Description

Overview

Most sheefish are harvested in streams and tributaries within the Kuskokwim. The largest sheefish sport fishery occurs in the Holitna River. This harvest and catch of sheefish by a sport fishery remains very low (Tables 1 and 2). A few local anglers have recently begun prospecting for sheefish in the lower tributaries of the Kuskokwim. Local anglers seek sheefish in spring and

fall when salmon are not available as a fresh source of fish. Stock sizes of sheefish in the Kuskokwim are unknown. A radiotelemetry project is scheduled to begin in 2007, with the hopes of identifying spawning locations and gathering overwintering and genetic information.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS. Estimates from the annual report are reviewed to ensure that sport harvests remain within sustainable yields. The focus of sport fishing regulations development is to enhance opportunity and maintain harvest within sustainable bounds. Current harvests appear to be within sustainable levels for sheefish of the Kuskokwim. High catches with low harvests indicate healthy fish stocks (Table 30). Additionally, the low harvests are not an indicator of depressed fish stocks but an under utilized resource.

Current Kuskokwim sheefish regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit for sheefish is two fish, with no size limit.

Kisaralik, Kasigluk, and Kwethluk Rivers

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Bag and possession limit in flowing waters of the drainage is five sheefish a day, no size limit.

In all Kuskokwim waters downstream of the Holitna River

- Bag and possession limit in the drainage is five sheefish, no size limit.

Holitna River

- Bag and possession limit in the drainage is two sheefish, no size limit.

Remainder of the Kuskokwim River drainage

- Bag and possession limit is ten sheefish a day, no size limit.

Current Kuskokwim Bay sheefish regulations:

All waters of Kuskokwim Bay:

- In all flowing waters of Kanektok and Goodnews River drainages only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit is two sheefish, no size limit.

Summary of 2004 and 2005 seasons

There were no reported problems by anglers having difficulties locating sheefish during recent years in the Kuskokwim, except for poor fishing conditions attributed to high water or late breakup.

Outlook

There are no current biological concerns for the sheefish fisheries in this area. Area stocks should continue to provide good angling opportunities for the 2007 season.

Lake Trout Fishery Description

Overview

Most lake trout are harvested in lakes of the headwater rivers and tributaries within the Kuskokwim. Many of these lakes are located in the lower Kuskokwim and Kuskokwim Bay area. Anglers utilize lakes in the headwaters to begin float trips on adjacent streams and rivers. However there are a few local anglers with float or ski planes fishing on local lakes for lake trout throughout the year. Local residents commonly seek lake trout when salmon are not available as a fresh source of fish. Stock sizes of lake trout in the lakes of the Kuskokwim are unknown. Lake trout of the Kuskokwim are similar to other Alaskan lake trout stocks. They are long-lived, slow-growing, late-maturing fish that can be easily overexploited in a relatively short period of time. Many of the lakes that contain lake trout are high altitude alpine lakes that have a short open water period with a short growing period. Historical harvests of lake trout in other locations in the state of Alaska suggest that past sport fishing practices can rapidly deplete lake trout stocks in small lakes.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS, estimates from the annual report are reviewed to ensure that sport harvests remain within sustainable yields. Sport fishing regulations are developed to match effort and harvest within sustainable bounds. Current regulations and harvests appear to be within sustainable levels for lake trout of the Kuskokwim. High catch rates with low harvest rates indicate healthy fish stocks. Occasionally there is some misidentification between Dolly Varden / Arctic char and lake trout. Some of the large harvests that arise in the SWHS report need further investigation from time to time to ensure proper identification for accurate reporting. Recent catch and harvest data suggest overall very low fishing pressure from the sport fishery.

The current bag and possession limit for lake trout is 2 per day, except for restrictions in the Aniak River. The only management action effecting lake trout during the January 2001 BOF Meeting occurred in the Aniak River with the establishment of aggregate bag limit for resident fish species for both subsistence and sport anglers. A six resident fish species limit was enacted for subsistence anglers during June, July and August. Sport anglers were restricted to an aggregate three (3) resident fish limit, but only allowing one fish of the following species: DV/AC, grayling, lake trout, sheefish, pike and burbot in any combination.

This regulation was replaced with individual bag limits by the 2004 BOF meeting.

Current Kuskokwim lake trout regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.
- Two lake trout a day, no size limit.

Kisaralik, Kasigluk, and Kwethluk Rivers

- Only unbaited, single–hook, artificial lures may be used in upper reaches or the entire drainage.
- Bag and possession limit in flowing waters of the drainage is two lake trout a day, no size.

In all Kuskokwim waters downstream of the Holitna River including the Holitna River drainage and remainder of the Kuskokwim River drainage, including Kuskokwim Bay

- Bag and possession limit in the drainage is two lake trout, no size limit.
- In all flowing waters of Kanektok and Goodnews River drainages only unbaited, single–hook, artificial lures may be used.

Summary of the 2004 and 2005 seasons

There were no angler reports of problems of locating lake trout during 2004 and 2005 in the Kuskokwim.

Outlook

Exploitation of area lake trout stocks appears to be low due to low levels of angler effort. It is difficult to distinguish lake trout from lake-resident Dolly Varden/Arctic char inhabiting the same lake from external characteristics and markings. Current low harvest rates combined with high catch rates suggest healthy fish populations. Lake trout studies conducted in AYK region have shown that even low levels of harvest can over exploit small populations of lake trout.

The outlook for lake trout and other resident fish species in the Kuskokwim area is good. The department and the BOF has invested substantial effort in regulation development to protect resident fish species.

Currently the Department has not identified a biological concern for lake trout fisheries in the Kuskokwim. Area stocks should continue to provide good angling opportunities for the 2007 season.

Burbot Fishery Description

Overview

Most burbot are harvests in the rivers and tributaries within the Kuskokwim. It is likely that these burbot are harvested by local anglers who are participating in subsistence activities in the area. Local residents commonly seek burbot when salmon are not available as a fresh source of fish. Stock size of burbot in the Kuskokwim is unknown but is believed to be fairly large. However local depletion has been known to occur in locations of intensive fishing, such as river mouths during the winter.

Historical Perspective and Fishery Management

Sport fishing effort, catch and harvest are estimated by the SWHS; estimates from the annual report are reviewed to ensure that sport harvests remain with sustainable yields. Sport fishing regulations are developed to match effort and harvest within sustainable bounds. Current regulations and harvests appear to be within sustainable levels for burbot of the Kuskokwim. The low harvests are not an indicator of depressed fish stocks but an under utilized resource (Table 33).

The current bag and possession limit is 15 burbot a day. Burbot may be taken under statewide regulations. Burbot may be taken in fresh water with more than one line and hook, provided:

1. the total aggregate number of hooks may not exceed 15 or the daily bag limit for burbot in the waters being fished, whichever is less;
2. the hooks are single hooks with a gap between point and shank larger than ¾ inch;
3. each hook is set to rest on the bottom of lake or stream;
4. each line is identified with the angler's name and address; and,
5. each line is physically inspected at least once during a 24-hour period.

During the January 2004 BOF Meeting, the removal of the aggregate bag limit for resident fish species for both subsistence and sport anglers occurred in the Aniak River. Sport fish regulations remain somewhat more restrictive for other species on the Aniak, but for burbot, the general regulations apply.

Current Kuskokwim burbot regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single–hook, artificial lures may be used.

Kisaralik, Kasigluk, Kwethluk

- Only unbaited, single–hook artificial lures may be used in upper reaches of the entire drainage.
- Bag and possession limit in flowing waters of the drainage is 15 burbot a day, no size limit.

In all Kuskokwim waters

- Bag and possession limit in the drainage is 15 burbot a day, no size limit.

Current Kuskokwim Bay burbot regulations:

All waters of Kuskokwim Bay

- In all flowing waters of Kanektok and Goodnews River drainages only unbaited, single–hook, artificial lures may be used.
- The bag and possession limit is 15 a day, no size limit.

Summary of 2004 and 2005 Seasons

There were no reported problems of anglers having difficulties locating burbot during recent seasons in the Kuskokwim.

Outlook

Currently the department has not identified a biological concern for burbot stocks or fishery concerns in the Kuskokwim. Area burbot stocks should continue to provide similar angling opportunities for the 2007 season.

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TABLES AND FIGURES

Table 1.–Sport fishing effort and harvest of principal species in the upper Kuskokwim River drainage (1990-2005).

	Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
All Kuskokwim drainages upstream from Aniak River											
Fishing Effort (days fished)											
	2,275	1,966	1,829	2,650	2,993	2,181	1,417	2,643	2,557	2,207	2,453
						Harvests					
Chinook Salmon	-	-	55	85	108	169	288	279	174	36	55
Chum Salmon	216	119	129	225	-	-	121	-	167	-	13-
Sockeye Salmon	12	-	49	112	43	-	9	32	-	33	23
Coho Salmon	36	481	275	55	244	170	327	872	95	1,028	730
Arctic Grayling	301	569	107	218	284	357	309	209	1858	142	179
Northern Pike	53	1,480	256	142	314	381	131	295	278	144	186
Sheefish	53	141	173	45	130	151	47	310	43	130	92
Dolly Varden	18	245	65	79	156	78	85	143	67	112	71
Holitna River											
Fishing Effort (days fished)											
	398	1,022	480	763	949	640	747	1,678	771	1,236	791
						Harvests					
Chinook Salmon	-	-	23	68	40	19	256	166	54	25	22
Chum Salmon	14	119	91	208	-	-	33	-	-	-	-
Sockeye Salmon	-	-	-	43	-	-	-	21	-	-	12
Coho Salmon	12	205	130	-	-	170	157	379	-	893	426
Arctic Grayling	18	312	23	-	-	184	121	101	124	74	38
Northern Pike	53	504	145	9	155	166	102	134	103	106	112
Sheefish	53	128	173	45	130	113	26	168	35	102	58
Dolly Varden	18	216	-	79	-	52	61	64	25	112	112
Holitna Total Harvest	168	1,484	585	452	325	704	769	1,055	341	1,312	686
Total Harvest	775	3,151	1,411	1,578	1,404	1,378	1,459	2,191	2,789	1,688	1,550

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Table 1.–Page 2 of 2.

	Year					Averages	
	2001	2002	2003	2004	2005	1995-2004	2000-2004
All Kuskokwim drainages upstream from Aniak River							
Fishing Effort (days fished)							
	3,531	669	3,241	4,121	2,758	162	127
			Harvests				
Chinook Salmon	219	-	48	186	241	66	106
Chum Salmon	41	-	-	-	325	681	863
Sockeye Salmon	152	-	-	144	379	581	586
Coho Salmon	408	227	1,446	1,504	602	316	387
Arctic Grayling	458	108	536	1,651	597	122	104
Northern Pike	330	74	483	862	1,536	245	430
Sheefish	124	-	45	156	803		
Dolly Varden	253	-	629	765	337	1,175	1,336
Holitna River							
Fishing Effort (days fished)							
	1,853	1,296	1,748	993	1,452	44	50
			Harvests				
Chinook Salmon	73	53	48	136	180	205	288
Chum Salmon	41	19	-	0	293	202	281
Sockeye Salmon	48	16	-	124	345	82	74
Coho Salmon	153	339	998	819	263	157	251
Arctic Grayling	154	144	259	846	403		
Northern Pike	145	78	249	820	1,136	1,117	1,398
Sheefish	124	18	15	156	349	2,425	2,948
Dolly Varden	143	77	549	372	203		
Holitna Total Harvest	168	744	2,118	3,273	3,172	720	2,502
Total Harvest	1,985	1,747	3,261	6,198	6,089		

Source: Mills 1991-1994; Howe 1995, 2001a-d; Walker 2003; Jennings 2004, 2006a-b, In prep a-b).

Table 2.–Sport catch of principal species in the upper Kuskokwim River drainage (1990-2000).

	Year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
All Kuskokwim drainages upstream from Aniak River											
Chinook Salmon	27	-	288	725	207	401	745	2,423	1,121	1,332	216
Chum Salmon	448	199	578	1,063	247	414	406	116	278	474	61
Sockeye Salmon	24	76	189	980	60	-	164	457	84	75	242
Coho Salmon	207	717	558	242	480	481	1,279	3,784	294	3,460	3,742
Arctic Grayling	2,761	4,082	1,775	2,103	2,556	2,036	2,241	3,881	11,015	1,636	2,149
Northern Pike	634	2,197	1,230	1,565	1,877	3,080	1,855	1,845	2,094	2,914	2,735
Sheefish	193	398	508	1,317	208	622	512	1,394	771	813	883
Dolly Varden	387	3,485	647	2,204	662	1,062	644	1,892	364	589	313
Holitna River											
Chinook Salmon	27	-	109	375	110	91	662	786	335	240	22
Chum Salmon	101	159	471	881	38	327	230	116	25	135	-
Sockeye Salmon	-	76	-	902	-	-	-	64	84	-	124
Coho Salmon	122	205	154	-	-	472	939	1,145	-	2,005	1,404
Arctic Grayling	264	1,953	8	372	228	631	615	1,803	8,303	1,016	381
Northern Pike	317	830	752	842	973	1,488	1,47	1,308	1,379	2,146	2,292
Sheefish	158	372	508	1,317	189	472	206	1,098	729	745	512
Dolly Varden	35	3,038	164	1,326	9	430	364	968	305	589	200
Holitna Total Catch	1,024	6,633	2,194	6,370	1,565	3,911	4,554	7,319	11,169	6,876	5,210
Total Catch	4,734	11,302	6,550	10,572	6,772	8,137	8,183	16,020	16,367	11,567	11,300

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Table 2.–Page 2 of 2.

	Year					Averages	
	2001	2002	2003	2004	2005	1996-05	2001-05
All Kuskokwim drainages upstream from Aniak River							
Chinook Salmon	3,497	707	833	1,086	581	1,236	1,268
Chum Salmon	1,013	762	1,500	1,131	2,530	616	893
Sockeye Salmon	1,765	24	105	333	573	361	494
Coho Salmon	5,037	3,887	7,989	9,641	5,415	3,959	6,059
Arctic Grayling	7,255	2,428	8,646	15,161	2,192	5,645	7,128
Northern Pike	3,469	2,133	2,345	5,527	6,023	2,800	3,242
Sheefish	2,974	307	768	883	3,460	993	1,163
Dolly Varden	387	1,922	4,144	7,554	1,152	1,887	2,864
Holitna River							
Chinook Salmon	823	210	272	619	470	406	389
Chum Salmon	350	426	209	426	1,638	249	353
Sockeye Salmon	951	24	105	270	467	232	295
Coho Salmon	4,027	613	4,699	3,046	2,168	2,039	2,758
Arctic Grayling	4,859	1,200	5,492	10,241	1,218	3,454	4,435
Northern Pike	2,579	699	1,318	4,628	3,105	1,982	2,303
Sheefish	381	270	59	591	2,843	506	363
Dolly Varden	2,229	618	3,256	3,921	313	1,288	2,045
Holitna Total Catch	16,245	4,060	15,410	23,742	12,692	5,162	9,850
Total Catch	26,182	12,869	26,330	41,316	21,926	17,827	23,599

Source: Mills 1991-1994; Howe 1995, 2001a-d; Walker 2003; Jennings 2004, 2006a-b, In prep a-b).

Table 3.–Annual sport fishing effort, in angler days, within the state of Alaska, Arctic-Yukon-Kuskokwim Region and Kuskokwim Management Area waters as estimated by the SWHS, 1977–2005.

		AYK		Kuskokwim	
Year	Statewide	Region	Percent	Mgmt Area	Percent
1977	1,197,590	123,161	10.3	[a]	
1978	1,285,063	145,492	11.3	[a]	
1979	1,364,739	126,096	9.2	[a]	
1980	1,488,962	160,266	10.8	[a]	
1981	1,420,172	148,886	10.5	[a]	
1982	1,623,090	198,791	12.2	[a]	
1983	1,732,528	199,361	11.5	[a]	
1984	1,866,837	199,041	10.7	14,597	7.3
1985	1,943,069	186,883	9.6	12,484	6.7
1986	2,071,412	194,713	9.4	11,842	6.1
1987	2,152,886	217,109	10.1	18,958	8.7
1988	2,311,291	233,559	10.1	26,171	11.2
1989	2,264,079	239,626	10.6	18,907	7.9
1990	2,453,284	245,629	10.0	15,858	6.5
1991	2,456,328	219,922	9.0	13,055	5.9
1992	2,540,374	181,852	7.2	14,404	7.9
1993	2,559,408	220,972	8.6	14,505	6.6
1994	2,719,911	209,987	7.7	18,117	8.6
1995	2,787,670	270,141	9.7	16,289	6.0
1996	2,006,528	201,166	10.0	16,420	8.2
1997	2,079,514	238,856	11.5	27,318	11.4
1998	1,856,976	227,841	12.3	27,913	12.3
1999	2,499,152	304,522	12.2	26,563	8.7
2000	2,627,805	241,574	9.2	20,030	8.3
2001	2,262,346	194,531	8.6	20,673	10.6
2002	2,259,091	220,276	9.8	20,645	9.4
2003	2,219,398	206,705	9.3	24,369	11.8
2004	2,473,961	217,041	8.8	25,406	11.7
2005	2,463,929	183,535	7.4	19,447	10.6
Mean (All Yrs)	2,103,014	205,432		19,271	
Mean (95-04)	2,307,244	232,265		22,563	
Mean (00-00)	2,368,520	216,025		22,225	

[a] Specific SWHS data not available for the Kuskokwim management area.

Table 4.–Kuskokwim-Kuskokwim Bay drainage sport fish harvest by fish species, 1989-2005.

	Year										
Species	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Chinook Salmon	2,237	897	786	1,046	1,674	2,148	1,328	2,439	3,345	3,401	1,400
Coho Salmon	4,282	1,358	2,087	2,033	2,056	2,978	2,771	5,231	5,430	4,897	3,974
Sockeye Salmon	291	620	214	189	715	894	277	752	1,181	1,867	1,154
Pink Salmon	191	347	36	219	27	126	16	167	75	133	0
Chum Salmon	2,571	749	647	927	731	1,626	455	517	384	596	520
Rainbow Trout	757	475	774	404	486	299	429	567	1,336	539	510
Lake Trout	1,086	72	272	356	218	40	215	126	404	141	128
Dolly Varden/ Arctic char	3,545	1,797	2,924	802	1,499	1,398	1,260	1,743	3,337	1,581	2,038
Arctic Grayling	2,622	1,340	2,603	545	739	850	845	663	1,292	3,554	1,290
Northern Pike	1,785	231	2,018	752	995	828	655	344	408	2,711	548
Whitefish	571	88	158	286	253	183	0	20	614	1,220	9
Burbot	12	1,125	40	169	214	20	0	0	0	185	228
Sheefish	296	107	154	292	54	390	272	20	589	277	268
Smelt	1,324	211	0	1,136	3,343	2,292	633	1,313	27	3,333	0
Halibut	0	144	0	33	54	45	21	0	50	350	0

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Table 4.–Page 2 of 2.

Species	Year					
	2000	2001	2002	2003	2004	2005
Chinook Salmon	1,181	1,384	1,397	734	1,197	2,184
Coho Salmon	3,294	4,474	4,265	5,297	7,096	5,591
Sockeye Salmon	822	422	267	289	512	792
Pink Salmon	10	11	143	46	416	66
Chum Salmon	359	176	598	67	117	608
Rainbow Trout	106	17	76	204	457	141
Lake Trout	152	63	134	244	497	233
Dolly Varden/ Arctic char	1,612	1,698	2,026	2,710	2,539	2,135
Arctic Grayling	361	807	1,464	1,259	1,953	1,287
Northern Pike	531	474	443	783	1,543	3,749
Whitefish	214	20	54	89	975	209
Burbot	588	50	15	87	111	75
Sheefish	250	124	81	45	182	1,079
Smelt	68	0	0	0	281	0
Halibut	53	0	0	0	0	32

Table 5..–Angler effort (angler days) in the lower Kuskikwim River and Kuskikwim Bay area of Alaska, 1983-2005.

	Kuskokwim Bay					Lower Kuskokwim River					Grand
Year	Kanektok	Goodnews	Arolik	Other	Total	Aniak	Kisaralik	Kwethluk	Other	Total	Total
1983	1,517	742		20	2,279	253			2,682	2,935	5,214
1984	6,881	1,010		344	8,235	383			1,149	1,532	9,767
1985	4,630	4,214		243	9,087	87			694	781	9,868
1986	8,825	229		61	9,115	1,116			703	1,819	10,934
1987	9,689	2,372		2,073	14,134	507			1,920	2,427	16,561
1988	12,697	1,219		5,233	19,149	2,437			2,724	5,161	24,310
1989	4,382	1,315		4,381	10,078	4,035			3,504	7,539	17,617
1990	4,525	1,507		4,512	10,544	1,964			3,610	5,574	16,118
1991	3,078	1,328		2,656	7,062	3,078			2,126	5,204	12,266
1992	4,972	1,387		2,068	8,427	2,604		640	1,654	4,898	13,325
1993	3,791	2,276		2,844	8,911	2,056		554	2,275	4,885	13,796
1994	6,505	2,038		1,406	9,949	1,815	1,463	466	1,124	4,868	14,817
1995	5,512	1,030		743	7,285	3,569	369	387	1,600	5,925	13,210
1996	8,305	2,322		625	11,252	3,964	1,525	1511	2,891	9,891	21,143
1997	9,706	5,011	1,475	1,807	17,999	4,778	1,578	642	1,445	8,443	26,442
1998	8,114	4,007	347	1,158	13,626	5,548	1,021	1498	1,306	9,373	22,999
1999	8,194	8,353	308	705	17,560	3,235	1,316	402	1,992	6,945	24,505
2000	7,231	4,038	13	121	11,403	2,141	2,084	1,131	472	6,100	17,503
2001	9,063	2,826	116	201	12,206	2,121	1,304	1,069	258	4,752	16,958
2002	5,885	3,215	765	271	10,136	2,688	2,410	920	1,620	7,638	17,774
2003	7,655	3,622	249	133	11,659	2,998	1,439	2,646	3,548	10,631	22,290
2004	6,364	2,499	1,456	410	10,729	4,186	2,071	2,021	340	8,618	19,347
2005	5,789	2,612	421	32	8,854	2,497	714	2,022	525	5,758	14,612
						Averages					
(1983-05)	6,666	2,573	572	1,393	10,799	2,419	1,377	819	1,743	5,233	16,031
(1995-04)	7,603	3,692	591	617	12,386	3,523	1,512	1,223	1,547	7,832	20,217
(2000-04)	7,240	3,240	520	227	11,227	2,827	1,862	1,557	1,248	7,548	18,774

Table 6.–Peak aerial survey index counts of Chinook salmon in tributaties of the lower Kuskikwim River, 1975-2005.

Year	Eek River	Kwethluk River	Kisaralik River	Tuluksak River	Aniak River	Kipchuk River[a]	Salmon River[a]
1975			118			94	
1976				139		177	
1977		2,290		291			562
1978	1,613	1,732	2,417	403			289
1979		911					
1980	2,378			725			1,186
1981		1,783	672		9,074		894
1982	230				2,645		185
1983	188	471	731	129	1,909		231
1984		273	157	93	1,409		
1985	1,118	629		135			
1986					909		336
1987	1,739	975		60		193	516
1988	2,255	766	840	188	945		244
1989	1,042	1,157	152		1,880	994	631
1990	1,983	1,295	631	166	1,255	537	596
1991	1,312	1,002		342	1,564	885	583
1992					2,284	670	335
1993					2,687	1,248	1,082
1994		848	1,021		1,848	1,520	1,218
1995			1,243		3,174	1,215	1,442
1996					3,496		983
1997			439	173	2,187	855	980
1998		27	457		2,239	353	
1999							
2000					714	182	152
2001							598
2002		1,795	2,285		1,856	1,615	1,236
2003	1,236	2,628	654	94	3,514	1,493	1,242
2004	4,653	6,801	6,913	1,196	5,569	1,868	2,177
2005		5,002	4,081	672		1,944	4,097
2006			4,734		5,639	1,618	
				SEG[b]			
		1,200	1,000	400	1,500		600
				Median[c]			
	1,460					670	

Note: Estimates are from peak aerial surveys conducted between July 20 and July 31 under fair, good, or excellent conditions.

[a] Tributaries of Aniak River.

[b] Applying current Salmon Escapement Goal Policy (5 AAC 2000b) to previous published BEG from Buklis (1993).

[c] Median of years 1975 through 1994.

Table 7.–Harvest of Chinook salmon in the commercial, subsistence, test and sport fisheries of the Kuskokwim River, 1960-2005.

Year	Harvest				Total
	Commercial[a]	Subsistence[b]	Test Fishery	Sport[c]	
1960	5,969	18,887			24,856
1961	18,918	28,934			47,852
1962	15,341	13,582			28,923
1963	12,016	34,482			46,498
1964	17,149	29,017			46,166
1965	21,989	24,697			46,686
1966	25,545	49,325	285		75,155
1967	29,986	59,913	766		90,665
1968	34,278	32,942	608		67,828
1969	43,997	40,617	833		85,447
1970	39,290	69,612	857		109,759
1971	40,274	43,242	756		84,272
1972	39,454	40,396	756		80,606
1973	32,838	39,093	577		72,508
1974	18,664	27,139	1,236		47,039
1975	22,135	48,448	704		71,287
1976	30,735	58,606	1,206		90,547
1977	35,830	56,580	1,264	33[e]	93,707
1978	45,641	36,270	1,445	116[e]	83,472
1979	38,966	56,283	979	74[e]	96,302
1980	35,881	59,892	1,033	162[e]	96,968
1981	47,663	61,329	1.218	189[e]	110,399
1982	48,234	58,018	542	207[e]	107,001
1983	33,174	47,412	1,139	420	82,145
1984	31,742	56,930	231	273	89,176
1985	37,889	43,874	79	85	81,927
1986	19,414	51,019	130	49	70,612
1987	36,179	67,325	384	355	104,243
1988	55,716	70,943[d]	576	528	127,763
1989	43,217	81,176	543	1,218	126,154
1990	53,504	85,979	512	394	140,389
1991	37,778	85,554	117	401	123,850
1992	46,872	64,795	1,380	367	113,414

-continued-

Table 7.-Page 2 of 2.

Year	Harvest				Total
	Commercial [a]	Subsistence [b]	Test Fishery	Sport[c]	
1993	8,735	87,512	2,483	587	99,317
1994	16,211	93,242	1,937	1,139	112,529
1995	30,846	96,436	1,421	541	129,244
1996	7,419	78,063	247	1,432	87,161
1997	10,441	81,577	332	1,227	93,577
1998	17,359	81,265	210	1,434	100,268
1999	4,705	73,194	98	252	78,249
2000	444	64,893	874	105	66,316
2001	90	73,610	86	290	74,076
2002	72	71,334	288	319	72,013
2003	150	67,788	409	734	68,347
2004	2,300	80,065	1,134	1,197	85,983
2005	4,784	68,213	883	1,092	71,873
2006	2,777				
1995-2004 Average	7,383	76,823	510	753	85,523
Percent Harvest	8.6%	89.8%	0.6%	0.9%	
2000-2004 Average	611	71,538	558	529	73,347
Percent Harvest	0.8%	97.5%	0.8%	0.7%	

a. District 1 and 2; also includes harvests in District 3 from 1960 to 1965.

b. Estimated subsistence harvest expanded from villages surveyed.

c. Statewide Harvest Survey (1977-2005).

d. Beginning in 1988, subsistence estimates are based on new methodology, not comparable with previous years.

e. Estimated by proportion.

Table 8.–Harvest of Chinook salmon in the commercial, subsistence, and sport fisheries in the Kanektok River, 1960–2005.

	Harvest			
Year	Commercial[a]	Subsistence [b]	Sport	Total
1960	0			0
1961	4,328			4,328
1962	5,526			5,526
1963	6,555			6,555
1964	4,081			4,081
1965	2,976			2,976
1966	278			278
1967	0	1,349		1,349
1968	8,879	2,756		11,635
1969	16,802			16,802
1970	18,269			18,269
1971	4,185			4,185
1972	15,880			15,880
1973	14,993			14,993
1974	8,704			8,704
1975	3,928			3,928
1976	14,110			14,110
1977	19,090	2,012		21,102
1978	12,335	2,328		14,663
1979	11,144	1,420		12,564
1980	10,387	1,940		12,327
1981	24,524	2,562		27,086
1982	22,106	2,402		24,508
1983	46,385	2,542	1,511	50,438
1984	33,633	3,109	922	37,664
1985	30,401	2,341	672	33,414
1986	22,835	2,682	938	26,455
1987	26,022	3,663	508	30,193
1988	13,883	3,690[f]	1,910	19,483
1989	20,820	3,542	884	25,246
1990	27,644	6,013	503	34,160
1991	9,480	3,693	316	13,489
1992	17,197	3,447	656	21,300

-continued-

Table 8.-Page 2 of 2.

Year	Harvest			
	Commercial [a]	Subsistence [b]	Sport	Total
1993	15,784	3,368	1,006	20,158
1994	8,564	3,995	751	13,310
1995	38,584	2,746	739	42,069
1996	14,165	3,075	689	17,929
1997	35,510	3,433	1,632	40,575
1998	23,158	4,041	1,475	28,674
1999	18,426	3,167	854	22,447
2000	21,229	3,106	833	25,168
2001	12,775	2,923	947	16,645
2002	11,480	2,475	779	14,734
2003	14,444	3,898	323	18,665
2004	25,465	3,726	228	29,419
2005	24,195	3,083	520	27,798
2006				
1995-2004 Average	21,524	3,259	850	25,633
Percent Harvest	82.9%	12.7%	3.3%	
2000-2004 Average	17,079	3,226	622	20,926
Percent Harvest	81.6%	15.4%	3.0%	

a. Quinhagak District commercial harvest. Source: Burkey et al. 2001.

b. Subsistence harvest by the community of Quinhagak. Source: Burkey et al. 2001.

c. Beginning in 1988, subsistence estimates are based on new methodology, not comparable with previous years.

Table 9.–Harvest of Chinook salmon in the commercial, subsistence, and sport fisheries in the Goodnews River, 1981-2005.

	Harvest			
Year	Commercial[a]	Subsistence[b]	Sport	Total
1981	7,190	1,409		8,599
1982	9,476	1,236		10,712
1983	14,117	1,066	31	15,214
1984	8,612	629		9,241
1985	5,793	426	323	6,542
1986	2,723	555		3,278
1987	3,357	816		4,173
1988	4,964	310[d]		5,274
1989	2,966	467	68	3,501
1990	3,303	682		3,985
1991	912	682	26	1,620
1992	3,528	252	23	3,803
1993	2,117	488	81	2,686
1994	2,570	657	163	3,390
1995	2,922	552	41	3,515
1996	1,375	526	157	2,058
1997	2,039	449	86	2,574
1998	3,675	718	431	4,824
1999	1,888	871	223	2,982
2000	4,442	703	243	5,388
2001	1,519	895	147	2,561
2002	979	857	224	2,060
2003	1,412	649	10	3,483
2004	2,565	851	100	3,516
2005	2,035	n/a	0	n/a
1995-2004 Average	2,282	707	166	3,296
Percent Harvest	69.2%	21.4%	5%	
2000-2004 Average	2,183	791	145	3,402
Percent Harvest	64.2%	23.3%	4.3%	

a. Quinhagak District commercial harvest. Source: Burkey et al. 2001.

b. Subsistence harvest by the community of Quinhagak. Source: Burkey et al. 2001.

d. Beginning in 1988, subsistence estimates are based on new methodology, not comparable with previous years.

Table 10.–Sport angler harvest and catch of Chinook salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	1,511		31				210		1,752	
1984	922						137		1,059	
1985	672		323				43		1,038	
1986	938						25		963	
1987	508						177		685	
1988	1,910						264		2,174	
1989	884		68				240		1,192	
1990	503	4,044					54	333	557	4,377
1991	316	1,742	26	68			93	176	435	1,986
1992	656	3,153	23	47			71	284	750	3,484
1993	1,006	5,245	81	469			143	1,249	1,230	6,963
1994	751	1,483	163	230			257	339	1,171	2,052
1995	739	3,226	41	279			42	174	822	3,679
1996	689	6,354	157	1,126			190	2,197	1,036	9,677
1997	1,632	13,244	86	1,569	0	0	147	203	1,865	15,016
1998	1,475	9,528	431	3,171	30	30	77	346	2,013	13,075
1999	854	4,205	223	3,823	0	115	12	25	1,089	8,168
2000	833	6,086	243	1,527	0	0	0	0	1,076	7,613
2001	947	10,842	147	2,769	0	0	0	212	1,094	13,823
2002	779	3,815	224	1,594	75	450	0	32	1,078	5,891
2003	323	3,480	10	695	0	36	0	11	343	4,222
2004	228	2,758	100	1,754	12	780	0	0	340	5,292
2005	520	10,116	0	375	0	0	0	0	520	21,127
1995-2004 Average	850	6,354	166	1,831	15	176	47	320	1,076	8,646
2000-2004 Average	622	5,396	145	1,668	17	253	0	51	786	7,368

Table 11.–Sport angler harvest and catch of Chinook salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							168		168	
1984							137		137	
1985							43		43	
1986							24		24	
1987							178		178	
1988							264		264	
1989	738						240		978	
1990	285	1,181					55	333	340	1,514
1991	214	222					94	176	308	398
1992	172	827			31	47	71	285	274	1,159
1993	300	1,426			0	47	144	1,249	444	2,722
1994	437	573	148	196			257	339	842	1,108
1995	279	2,729					42	174	321	2,903
1996	592	3,375					190	1,038	782	4,413
1997	801	12,943	49	678	49	108	49	128	948	13,857
1998	1,058	5,896	6	74	75	467	44	167	1,183	6,604
1999	134	2,776	0	12	0	0	109	153	243	2,941
2000	10	435	10	343	20	171	0	0	40	949
2001	12	713	0	62	43	77	16	16	71	868
2002	135	1,759	46	531	30	195	0	33	211	2,518
2003	12	874	75	335	103	861	163	1880	353	4,167
2004	335	1,103	58	1,774	150	778	12	1,074	671	4,047
2005	189	594	40	907	68	385	0	123	331	2,071
1995-2004 Average	337	3260	31	476	59	332	63	466	482	4327
2000-2004 Average	101	977	38	609	69	416	38	601	269	2510

Table 12.–Harvest of coho salmon in the commercial, subsistence, test and sport fisheries in the Kuskokwim River, 1960-2005.

	Harvest				
Year	Commercial[a]	Subsistence[b]	Test Fishery[c]	Sport	Total
1960	2,498				2,498
1961	5,044				5,044
1962	12,432				12,432
1963	15,660				15,660
1964	28,613				28,613
1965	12,191				12,191
1966	22,985				22,985
1967	56,313				56,313
1968	127,306				127,306
1969	83,765				83,765
1970	38,601				38,601
1971	5,253				5,253
1972	22,579				22,579
1973	130,876				130,876
1974	147,269				147,269
1975	81,945				81,945
1976	88,501				88,501
1977	241,364				241,364
1978	213,393				213,393
1979	219,060				219,060
1980	222,012				222,012
1981	211,251				211,251
1982	447,117				447,117
1983	196,287			1,375	197,662
1984	623,447			1,442	624,889
1985	335,606	24,236		136	359,978
1986	659,988	29,693		1,222	690,903
1987	399,467	17,917		1,767	419,151
1988[e]	524,296	38,387		927	563,610
1989	479,856	52,918		2,459	535,233
1990	410,332	44,791		581	455,704
1991	500,935	50,331		1,003	552,269
1992	666,170	40,168		1,692	708,030
1993	610,739	31,737		980	643,456
1994	724,689	33,050		1,925	759,664
1995	471,461	36,277		1,497	509,235

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Year	Harvest				Total
	Commercial[a]	Subsistence[b]	Test Fishery[c]	Sport	
1996	937,299	32,741		3,423	973,463
1997	130,803	29,032		2,408	174,491
1998	210,481	24,864		2,419	237,764
1999	23,593	25,003		1,998	50,594
2000	261,379	33,786		1,689	296,854
2001	192,998	29,504		1,204	223,706
2002	83,463	34,304		2,030	119,797
2003	284,064	35,240		5,297	324,601
2004	433,809	35,735		7,096	469,544
2005	142,319	26,487		5,591	174,397
1995-2004 Average	284,210	31,649		2,906	338,005
Percent Harvest	84.1%	9.4%		0.9%	
2000-2004 Average	251,143	33,714		3,463	286,900
Percent Harvest	87.5%	11.8%		1.2%	

a. District 1 and 2; also includes harvests in District 3 from 1960 to 1965.

b. Estimated subsistence harvest expanded from villages surveyed.

c. Test fishery coho harvests not available.

d. Statewide Harvest Survey (1977-2001).

e. Beginning in 1988, subsistence estimates are based on methodology, previous estimates are not comparable.

Table 13.–Harvest of coho salmon in the commercial, subsistence, and sport fisheries in the Kanektok River, 1983-2005.

	Harvest			
Year	Commercial[a]	Subsistence[b]	Sport	Total
1983	32,442		367	32,809
1984	132,151		1,895	134,046
1985	29,992		622	30,614
1986	57,544		2,010	59,554
1987	50,070		2,300	52,370
1988	68,605	4,317[d]	1,837	74,759
1989	44,607	3,787	1,096	49,490
1990	26,926	4,174	644	31,744
1991	42,571	3,232	358	46,161
1992	86,404	2,958	275	89,637
1993	55,817	2,152	734	58,703
1994	83,912	2,739	675	87,326
1995	66,203	2,561	970	69,734
1996	118,718	1,467	875	121,060
1997	32,862	1,264	1,220	35,346
1998	80,183	1,702	751	82,636
1999	6,184	2,021	1,091	9,296
2000	30,529	1,088	799	32,425
2001	18,531	1,525	2,448	22,504
2002	26,695	1,099	1,784	29,578
2003	49,833	2,047	1,076	54,157
2004	82,398	1,209	1,362	52,493
2005	51,708	1,443	1,006	48,833
2006	n/a	n/a	n/a	
1996-2005 Average	51,214	1,598	1,238	50,923
Percent Harvest	94.8%	2.8%	2.4%	
2001-2005 Average	41,597	1,465	1,535	48,833
Percent Harvest	85.2%	3.0%	3.0%	

[a] Quinhagak (District 4) commercial harvest.

[b] Subsistence harvests by the community of Quinhagak.

[c] Beginning in 1988, subsistence estimates are based on new methodology, not comparable with previous years.

Table 14.–Harvest of coho salmon in the commercial, subsistence, and sport fisheries in the Goodnews River, 1983-2005.

	Harvest			
Year	Commercial[a]	Subsistence[b]	Sport	Total
1983	19,660		168	19,828
1984	71,176			71,176
1985	16,498	11	386	16,895
1986	19,378	8		19,386
1987	29,057	43		29,100
1988	30,832	1,162[c]		31,994
1989	31,849	907	224	32,980
1990	7,804	1,646		9,450
1991	13,312	1,828	297	15,437
1992	19,875	1,353	138	21,366
1993	20,014	1,226	189	21,429
1994	47,499	512	170	48,181
1995	17,875	305	114	18,294
1996	43,836	352	466	44,654
1997	2,983	397	855	4,235
1998	21,246	331	574	22,151
1999	2,474	582	789	3,845
2000	15,531	517	795	16,843
2001	9,275	616	822	10,713
2002	3,041	297	429	3,767
2003	12,730	1,110	42	13,882
2004	23,690	1,411	622	25,723
2005	11,735	n/a	1,046	12,781
1995-2004 Average	15,268	592	551	16,411
Percent Harvest	93%	3.6%	3.4%	
2000-2004 Average	12,853	790	542	14,186
Percent Harvest	90.6%	5.6%	3.8%	

[a] Goodnews Bay (District 5) commercial harvest.

[b] Subsistence harvests by the communities of Goodnews Bay and Platinum.

[c] Beginning in 1988, subsistence estimates are based on new methodology, not comparable with previous years.

Table 15.–Sport angler harvest and catch of coho salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	367		168				714		1,249	
1984	1,895						864		2,759	
1985	622		386				74		1,082	
1986	2,010						684		2,694	
1987	2,300						1,232		3,532	
1988	1,837						1,356		3,193	
1989	1,096		224				905		2,225	
1990	644	4,044					260	333	904	4,377
1991	358	2,404	297	1,176			338	553	993	4,133
1992	275	3,174	138	1,571			291	707	704	5,452
1993	734	3,741	189	645			295	1,334	1,218	5,720
1994	675	1,322	170	456			755	1,089	1,600	2,867
1995	970	3,602	114	761			233	623	1,317	4,988
1996	1,251	5,084	466	1,375			379	1,153	2,096	7,612
1997	1,220	14,366	855	2,915	221	276	703	2,179	2,989	19,736
1998	751	15,017	574	7,852	74	737	172	184	1,571	23,790
1999	1,091	13,677	789	12,185	11	621	12	1,281	1,903	27,764
2000	799	13,043	795	9,045	0	0	0	0	1,594	22,088
2001	2,448	21,941	822	8,431	0	783	0	49	3,270	31,204
2002	1,784	10,922	429	6,889	22	1,179	0	174	2,235	19,164
2003	1,076	19,257	681	15,845			58	231	1,815	35,333
2004	1,362	23,845	622	10,985			0	3,656	1,984	38,486
2005	520	13,279	1,046	11,541			0	2,397	1,566	27,217
1995-2004 Average	1,275	14,075	615	7,628	55	599	156	953	2,077	23,017
2000-2004 Average	1,494	17,802	670	10,239	7	654	12	822	2,180	29,255

Table 16.–Sport angler harvest and catch of coho salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							571		571	
1984							864		864	
1985							74		74	
1986							684		684	
1987							1,232		1,232	
1988							1,355		1,355	
1989	939						905		1,844	
1990	182	1,181					260	333	442	1,514
1991	327	1,432					338	553	665	1,985
1992	235	575			624	1,790	291	708	1,150	3,073
1993	213	753			313	566	295	1,334	821	2,653
1994	507	852	72	492			755	1,089	1,334	2,433
1995	852	2,246					233	623	1,085	2,869
1996	986	3,746					196	5,233	1,182	8,979
1997	978	4,576	182	838	274	490	102	127	1,536	6,031
1998	1,128	3,639	172	2,638	714	3,204	61	184	2,075	9,665
1999	436	3,971	270	2,315	131	774	98	700	935	7,760
2000	440	8,531	199	1,231	220	1,705	0	52	859	11,519
2001	335	2,186	195	2,605	237	1,608	19	39	786	6,438
2002	673	3,193	167	1,766	153	310	78	374	1,071	10,269
2003	405	11,480	377	1,518			892	9,826	1,311	15,395
2004	1,207	6,337	226	2,457	649	3,608	279	1,104	2,361	13,506
2005	1,164	3,813	298	751			0	2,397		
1995-2004 Average	744	4,991	224	1,921	340	1,671	196	1,826	1,320	9,243
2000-2004 Average	612	6,345	233	1,915	315	1,808	254	2,279	1,278	11,425

Table 17.–Harvest of chum salmin in the commercial subsistence, text and sport fisheries in the Kuskekwim River, 1960-2005.

	Harvest				
Year	Commercial[a]	Subsistence[b]	Test Fishery	Sport	Total
1960	0	301,753[c]			301,753
1961	0	179,529[c]			179,529
1962	0	161,849[c]			161,849
1963	0	137,649[c]			137,649
1964	0	190,191[c]			190,191
1965	0	250,878[c]			250,878
1966	0	175,735[c]	502[d]		176,237
1967	148	208,445[c]	338		208,931
1968	187	275,008[c]	562[d]		275,757
1969	7,165	204,105[c]	384		211,654
1970	1,664	246,810[c]	1,139		249,613
1971	68,914	116,391[c]	254		185,559
1972	78,619	120,316[c]	486		199,421
1973	148,746	179,259[c]	675		328,680
1974	171,887	277,170[c]	2,021		451,078
1975	184,171	176,389[c]	1,062		361,622
1976	177,864	223,792[c]	2,101		403,757
1977	248,721	198,355[c]	576	129[f]	447,781
1978	248,656	118,809[c]	2,153	555[f]	370,173
1979	261,874	161,239[c]	412	259[f]	423,784
1980	483,211	165,172[c]	2,058	324[f]	651,305
1981	418,677	157,306[c]	1,793	598[f]	578,374
1982	278,306	190,011[c]	504	1,125[f]	469,946
1983	276,698	146,876[c]	1,069	922	425,565
1984	423,718	142,542[c]	1,186	520	567,966
1985	199,478	94,750	616	150	294,994
1986	309,213	141,931[c]	1,693	245	453,082
1987	574,336	70,709	2,302	566	647,913
1988	1,381,674	151,967[e]	4,379	764	1,538,784
1989	749,182	139,687	2,082	2,023	892,974
1990	461,624	126,508	2,107	533	590,772
1991	431,802	93,075	931	378	526,186
1992	344,603	96,491	15,330	608	457,032

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Year	Harvest				
	Commercial[a]	Subsistence[b]	Test Fishery	Sport	Total
1993	43,337	59,396	8,451	359	111,543
1994	271,115	72,025	11,998	1,280	356,418
1995	605,918	67,862	17,473	226	691,479
1996	207,877	88,965	2,864	280	299,986
1997	17,026	39,970	790	86	57,872
1998	207,809	63,537	1,140	291	272,777
1999	23,006	43,601	562	180	67,349
2000	11,570	51,696	1,038	26	64,330
2001	1,272	49,874	1,743	112	53,001
2002	1,900	72,603	2,666	53	77,203
2003	2,764	43,320		67	
2004	20,429	52,374		117	
2005	69,139	46,036		608	
1995-2004 Average	109,957	57,380	3,535	144	198,000
Percent Harvest	55.50%	29%	2.00%	0.1%	
2000-2004 Average	7,587	53,973	1,816	75	64,845
Percent Harvest	11.70%	83.20%	2.80%	0.1%	

a. Districts 1 and 2, only; no chum harvests reported in District 3.

b. Estimated subsistence harvest expanded from villages surveyed.

c. Composite harvest includes chum salmon and small Chinook, sockeye and coho salmon.

d. Includes a small number of small sockeye salmon.

e. Beginning in 1989, subsistence estimates based on new methodology, previous estimates are not comparable.

f. Estimated based on proportion.

Table 18.–Sport angler harvest and catch of chum salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	315		10				461		786	
1984	376						260		636	
1985	149		124				75		348	
1986	777						123		900	
1987	111						283		394	
1988	618						382		1,000	
1989	537		0				442		979	
1990	202	4,532					187	523	389	5,055
1991	80	1,382	189	527			105	393	374	2,302
1992	251	3,994	0	402			91	380	342	4,776
1993	183	4,849	156	924			129	1,135	468	6,908
1994	156	6,386	15	381			496	1,186	667	7,953
1995	213	5,049	0	315			5	82	218	5,446
1996	200	8,155	0	351			9	352	209	8,858
1997	212	11,041	24	1,111	0	43	62	517	298	12,712
1998	213	11,560	50	2,955	0	17	11	175	274	14,707
1999	293	14,241	47	7,561	0	0	0	16	340	21,818
2000	231	10,200	12	4,243	0	24	0	0	243	14,467
2001	43	6,457	21	2,188	0	0	0	129	64	8,774
2002	446	10,779	99	4,059	0	590	0	105	545	15,533
2003	14	7,138	14	3,195			0	3,195	28	10,402
2004	33	4,715	0	1,757			0	2,309	33	8,781
2005	108	9,241	0	1,481			0	0	108	10,722
1995-2004 Average	190	8,934	27	2,774	0	17	0	375	225	12,150
2000-2004 Average	153	7,858	29	3,088	0	12	0	522	183	10,842

Table 19.–Sport angler harvest and catch of chum salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							369		369	
1984							260		260	
1985							75			
1986							123		123	
1987							283		283	
1988							382		382	
1989	1,140						442		1,582	
1990	182	571					187	523	369	1,094
1991	169	656					105	393	274	1,049
1992	304	1,670			30	91	92	380	426	2,141
1993	101	2,412			0	2,269	129	1,135	230	5,816
1994	231	1,342	58	1,123			496	1,186	785	3,651
1995	127	2,785					5	82	132	2,867
1996	110	3,888					56	3,588	166	7,476
1997	86	2,369	0	9	0	53	0	125	86	2,556
1998	101	2,664	0	163	8	296	15	378	124	3,501
1999	139	4,055	0	456	41	176	0	22	180	4,709
2000	0	3,914	13	2,091	0	85	0	0	13	6,090
2001	0	1,899	0	106	71	425	0	213	71	2,643
2002	0	2,096	0	745	34	455	0	428	34	3,724
2003	0	2,347	0	450	0	0	25	598	25	3,395
2004	0	1,602	0	606	70	308	0	0	70	1,702
2005	0	788	0	247	0	0	80	595	80	1,630
1995-2004 Average	56	2,762	2	578	28	225	10	543	90	3,866
2000-2004 Average	0	2,372	3	800	35	255	5	248	43	3,511

Table 20.–Harvest of sockeye salmon in the commercial, subsistence, test and sport fisheries in the Kuskokwim River, 1960-2005.

	Harvest				
Year	Commercial[a]	Subsistence[b]	Test Fishery[c]	Sport[d]	Total
1960	0				0
1961	0				0
1962	0				0
1963	0				0
1964	0				0
1965	0				0
1966	0				0
1967	0				0
1968	0				0
1969	322				322
1970	117				117
1971	2,606				2,606
1972	102				102
1973	369				369
1974	136				136
1975	23				23
1976	2,971				2,971
1977	9,379				9,379
1978	733				733
1979	1,054				1,054
1980	360				360
1981	48,375				48,375
1982	33,154				33,195
1983	68,855			41	68,855
1984	48,575				48,647
1985	106,647	32,822		72	139,665
1986	95,433	18,873		196	114,523
1987	136,602	23,158		217	160,051
1988	92,025	30,775[e]		291	122,833
1989	42,747	35,224		33	78,052
1990	84,870	36,276		61	121,184
1991	108,946	52,984		38	162,061
1992	92,218	32,066		131	124,632

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Year	Harvest				Total
	Commercial[a]	Subsistence[b]	Test Fishery[c]	Sport[d]	
1993	27,008	49,348		348	76,715
1994	49,365	37,159		359	86,619
1995	92,500	27,791		95	120,606
1996	33,878	34,213		315	68,220
1997	21,989	40,097		423	62,160
1998	60,906	35,425		178	96,396
1999	16,976	46,677		54	63,699
2000	4,130	41,783		46	46,144
2001	84	48,601		231	50,175
2002	84	25,499		26	26,694
2003	282	34,452		289	
2004	9,748	32,433		512	
2005	27,645	33,878		792	
1995-2004 Average	24,058	36,697		217	61,181
Percent Harvest	39.3%	60.0%		0.4%	
2000-2004 Average	2,866	38,241		221	40,146
Percent Harvest	7.1%	95.3%		0.5%	

a. District 1 and 2; includes harvest in District 3 from 1960 and 1965.

b. Estimated subsistence harvest expanded from villages surveyed.

c. Test fishery sockeye harvests not available.

d. Statewide Harvest Survey (1977-2005).

e. Beginning in 1988, subsistence estimates are based on new methodology, previous estimates are not comparable.

Table 21.–Sport angler harvest and catch of sockeye salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	0		14				247		261	
1984	143						156		299	
1985	12		75				62		149	
1986	200		122				98		420	
1987	153		266				0		419	
1988	109						637		746	
1989	101		146				22		269	
1990	462	3,293					73	97	535	3,390
1991	88	1,147	63	2,003			25	126	176	3,276
1992	66	1,290	8	90			57	246	131	1,626
1993	331	1,887	53	321			260	1,296	644	3,504
1994	313	3,622	70	207			494	530	877	4,359
1995	148	733	34	380			42	64	224	1,177
1996	335	2,157	87	1,119			120	186	542	3,462
1997	607	2,155	61	1,625			10	248	678	4,028
1998	942	3,987	502	3,402			60	148	1,504	7,537
1999	496	4,537	561	1,999			0	278	1,057	6,814
2000	694	5,700	82	997			11	11	787	6,708
2001	83	1,415	108	1,128	0	68	0	290	191	2,901
2002	73	1,423	149	3,112	3	161	0	134	225	4,830
2003	107	5,082	42	1,502	na	na	0	60	149	6,644
2004	112	1,330	0	891	na	na	0	331	112	2,552
2005	156	5,692	0	683	na	na	0	43	156	6,418
1995-2004 Average	360	2,852	163	1,616	2	115	24	175	547	4,665
2000-2004 Average	214	2,990	76	1,526	2	115	2	165	293	4,727

na = Arolik and other lower Kuskokwim Rivers combined in Statewide Harvest Survey.

Table 22.–Sport angler harvest and catch of sockeye salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983										
1984										
1985										
1986										
1987										
1988										
1989	22								22	
1990	49	182							49	182
1991	38	151							38	151
1992	25	74			0	58			25	132
1993	17	79			19	19			36	98
1994	17	87	0	452					17	539
1995	43	166					10	21	53	187
1996	186	367							186	367
1997	391	353							391	353
1998	195	367							195	367
1999	21	407							21	407
2000	23	286	0	117				12	23	415
2001	24	222	34	156	0	37	21	21	79	436
2002	26	54	0	16	0	61	0	101	26	232
2003	0	390	74	75			42	182	116	647
2004	119	185	22	45	65	218	11	11	217	459
2005	0	606	22	22			112	112	134	740
1995-2004 Average	103	280	26	82	22	105	17	58	131	387
2000-2004 Average	38	227	26	82	22	105	19	65	92	438

Table 23.–Sport angler harvest and catch of rainbow trout in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	640		52				467		1,159	
1984	312						552		864	
1985	156		451				26		633	
1986	259						111		370	
1987	132						230		362	
1988	400						599		999	
1989	126		316				107		549	
1990	281	7,810					79	1,205	360	9,015
1991	182	5,856	258	2,776			129	517	569	9,149
1992	55	1,496	0	1,282			123	835	178	3,613
1993	130	4,106	145	3,994			71	1,535	346	9,635
1994	59	4,779	19	945			45	326	123	6,050
1995	198	3,046	43	1,263			10	1,324	251	5,633
1996	138	6,833	36	1,581			0	914	174	9,328
1997	231	27,325	433	9,653	43	1,798	25	525	732	39,301
1998	0	13,567	97	5,738	0	631	8	877	105	20,813
1999	73	11,151	133	5,926	0	2,070	12	159	218	19,306
2000	0	6,019	0	2,446	0	24	11	110	11	8,599
2001	0	7,984	0	2,312	0	46	0	547	0	10,889
2002	0	8,846	32	2,915	0	2,160	0	572	32	14,493
2003	0	8,455	44	3,125			0	453	44	12,033
2004	68	8,525	68	2,540			12	5,183	148	16,248
2005	0	7,070	0	2,747			0	1,769	0	11,586
1995-2004 Average	71	10,175	89	3,750	7	1,122	8	1,066	172	15,664
2000-2004 Average	14	7,966	29	2,668	0	743	5	1,373	47	12,452

Table 24.–Sport angler harvest and catch of rainbow trout in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							467		467	
1984							552		552	
1985							26		26	
1986							111		111	
1987							230		230	
1988							600		600	
1989	101						107		208	
1990	35	2,216					79	1,205	114	3,421
1991	76	1,881					129	517	205	2,398
1992	32	934			71	158	123	835	226	1,927
1993	10	1,144			58	333	72	1,535	140	3,012
1994	8	656	124	1,226			45	326	177	2,208
1995	0	1,581					9	1,234	9	2,815
1996	24	3,347					357	3,329	381	6,676
1997	53	12,293	218	7,060	227	334	24	2,040	522	21,727
1998	349	5,004	0	1,289	69	980	23	2,242	441	9,515
1999	175	4,659	0	1,877	117	269	12	143	304	6,948
2000	24	4,643	47	3,076	24	1,054	0	0	95	8,773
2001	0	1,268	0	1,010	17	896	0	8	17	3,182
2002	0	2,942	29	5,520	0	3,398	15	1,275	44	13,135
2003	0	2,477	21	1,241			21	650	42	4,368
2004	0	1,908	99	3,134	117	1,027	0	0	216	6,069
2005	0	1,077	78	3,378			53	487	131	4,942
1995-2004 Average	69	4,012	52	3,026	45	1,151	79	1,347	246	6,831
2000-2004 Average	5	2,648	37	2,796	40	1,774	9	483	80	7,105

Table 25.–Sport angler harvest and catch of Dolly Varden/Arctic char in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok Rivers		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	1,406		147				1,583		3,136	
1984	1,116						384		1,500	
1985	815		780				261		1,856	
1986	1,213						195		1,408	
1987	752						704		1,456	
1988	2,146						1,082		3,228	
1989	2,032		530				635		3,197	
1990	1,020	10,572					80	1,013	1,100	11,585
1991	389	10,757	605	9,936			361	2,629	1,355	23,322
1992	66	3,990	82	5,694			233	1,286	381	10,970
1993	378	10,136	343	8,156			206	3,917	927	22,209
1994	233	9,242	132	3,538			197	677	562	13,457
1995	212	6,231	158	2,336			95	1,110	465	9,677
1996	474	13,954	240	4,352			118	1,223	832	19,529
1997	789	41,748	1,071	23,498	21	685	14	1,570	1,895	67,501
1998	368	24,287	460	16,680	0	643	0	25	828	41,635
1999	615	21,700	917	18,174	33	3,248	34	811	1,599	43,933
2000	417	13,490	658	11,422	0	0	12	424	1,087	25,336
2001	543	15,673	418	12,613	0	0	44	815	1,005	29,101
2002	497	15,555	664	14,436	85	1,985	12	990	1,258	32,966
2003	457	16,988	555	19,016			0	298	1012	36,302
2004	482	29,990	331	10,886			289	14,829	1102	55,705
2005	256	17,443	742	18,994			12	3,198	1010	39,635
1995-2004 Average	485	19,962	547	13,341	23	1,094	62	2,210	1,108	39,112
2000-2004 Average	479	18,339	525	13,675	28	662	71	3,471	1,093	35,882

Table 26.–Sport angler harvest and catch of Dolly Varden / Arctic char in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							1,583		1,583	
1984							384		384	
1985							261		261	
1986							196		196	
1987							704		704	
1988							1,082		1,082	
1989	808						635		1,443	
1990	598	6,174					81	1,013	679	7,187
1991	547	3,514					360	2,629	907	6,143
1992	115	3,736			57	57	233	1,286	405	5,079
1993	260	9,340			97	349	206	3,917	563	13,606
1994	496	3,115	117	1,013			197	677	810	4,805
1995	481	3,454					95	1,110	576	4,564
1996	159	4,883					642	3,367	801	8,250
1997	316	12,066	413	4,708	243	243	14	1,189	986	18,206
1998	394	21,053	92	599	14	188	102	1,595	602	23,435
1999	114	5,909	181	3,875	0	44	34	342	329	10,170
2000	40	5,333	367	3,664	47	95	0	36	454	9,128
2001	87	1,857	320	2,454	33	142	0	22	440	4,475
2002	212	6,288	345	4,494	53	2,223	11	1,020	621	14,025
2003	178	4,033	432	2,693			155	1,360	765	8,086
2004	288	6,496	114	4,343	230	2,376	27	27	659	13,242
2005	296	2,477	246	1,241			0	650	542	4,368
1995-2004 Average	227	7,137	283	3,354	89	759	108	1,007	623	11,358
2000-2004 Average	161	4,801	316	3,530	91	1,209	39	493	588	9,791

Table 27.–Sport angler harvest and catch of Arctic grayling in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Rivers		Kuskokwim Bay Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983	231		178				4,343		4,752	
1984	169						1,033		1,202	
1985	87		416				694		1,197	
1986	213						513		726	
1987	244						1,124		1,368	
1988	164						1,593		1,757	
1989	58		198				875		1,131	
1990	123	3,940					398	2,296	521	6,236
1991	54	3,092	122	461			671	3,295	847	6,848
1992	23	391	0	609			163	2,278	186	3,278
1993	25	2,727	17	851			181	3,636	223	7,214
1994	0	1,599	0	1,813			332	1,674	332	5,086
1995	0	1,128	14	412			167	1,952	181	3,492
1996	0	2,960	47	941			66	2,702	113	6,603
1997	99	5,335	74	2,706	0	180	88	1,703	261	9,924
1998	33	5,576	28	3,126	0	221	105	1,365	166	10,288
1999	159	4,218	84	2,544	0	447	194	1,191	437	8,400
2000	25	3,632	0	1,726	0	0	0	86	25	5,444
2001	47	3,955	65	2,431	0	0	19	458	131	5,844
2002	47	3,622	221	2,543	0	670	0	512	268	7,347
2003	0	3,888	42	1,130			0	380	42	5,398
2004	33	3,417	130	2,343			60	1,329	223	8,418
2005	11	1,895	29	749			0	51	40	2,695
1995-2004 Average	44	3,773	71	1,990	0	253	70	1,168	185	6,763
2000-2004 Average	30	3,703	92	2,035	0	223	16	553	138	6,490

Table 28.–Sport angler harvest and catch of Arctic grayling in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							4,343		4,343	
1984							1,033		1,033	
1985							694		694	
1986							513		513	
1987							1,124		1,124	
1988							1,593		1,593	
1989	909						875		1,784	
1990	422	5,259					398	2,296	820	7,555
1991	1,085	4,841					671	3,295	1,756	8,136
1992	121	3,855			75	120	163	2,278	359	6,253
1993	288	5,580			47	166	181	3,636	516	9,382
1994	116	2,022	69	1,920			333	1,674	518	5,616
1995	53	2,266					167	1,952	220	4,218
1996	103	5,102					158	2,711	261	7,813
1997	162	15,089	303	3,746	256	499	20	984	741	20,318
1998	715	11,930	64	984	8	1,408	90	1,333	877	15,655
1999	437	8,659	63	3,641	0	226	211	609	711	13,135
2000	42	5,950	29	3,605	38	995	0	946	109	11,496
2001	77	3,300	64	3,356	77	3,058	0	69	218	9,783
2002	172	11,518	507	8,184	226	3,000	25	2,263	930	24,965
2003	58	6,787	280	3,188			121	1,518	459	11,493
2004	0	3,844	45	4,669	23	697	11	147	79	9,357
2005	108	2,149	346	2,822			131	1,248	585	6,219
1995-2004 Average	182	7,445	169	3,922	90	1,412	80	1,253	880	10,712
2000-2004 Average	70	6,280	185	4,600	91	1,938	31	989	454	12,363

Table 29.–Sport angler harvest and catch of northern pike in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							6,420		6,420	
1984							1,520		1,520	
1985							1,595		1,595	
1986							856		856	
1987							878		878	
1988							4,019		4,019	
1989	70						3,383		3,453	
1990	18	53					213	2,376	231	2,429
1991	244	1,448					1,774	3,173	2,018	4,621
1992	43	794			60	231	504	1,956	607	2,981
1993	0	45			329	526	666	3,094	995	3,665
1994	54	698	0	18			565	2,694	619	3,410
1995	77	623					164	1,423	241	2,046
1996	10	399					176	1,950	186	2,349
1997	42	303	21	119	0	206	99	270	162	898
1998	553	1,883	67	67	18	247	85	241	723	2,438
1999	94	674	0	27	0	0	66	189	160	890
2000	0	298	11	55	0	153	296	557	307	1,063
2001	65	493	0	0	14	41	65	78	144	612
2002	45	655	0	47	78	350	131	645	254	1,697
2003	10	1,756	0	65			24	467	34	2,288
2004	121	713	0	692	289	1,603	166	965	576	3,973
2005	77	805	247	283			591	1,148	915	2,236
1995-2004 Average	102	780	12	136	57	371	127	679	279	1,825
2000-2004 Average	48	783	2	172	95	537	136	542	263	1,927

Table 30.–Sport angler harvest and catch of sheefish in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005

	Aniak River		Kisaralik River		Kwethluk River		Other Rivers		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							901		901	
1984							481		481	
1985							210		210	
1986							194		194	
1987							452		452	
1988							1,074		1,074	
1989							722		722	
1990							107	316	107	316
1991	13	141					141	398	154	539
1992	0	11					119	119	119	130
1993	0	626					54	1,326	54	1,952
1994	88	154					124	171	212	325
1995	9	623					94	537	103	1,160
1996	20	89					44	283	64	372
1997	22	225					127	469	149	694
1998	30	47	14	197	38	493	42	99	124	836
1999	81	290	0	0	0	0	27	69	108	359
2000	0	7	0	0	0	0	158	158	158	165
2001	0	232	0	0	0	0	0	0	0	232
2002	51	133	0	0	0	0	0	0	51	133
2003	0	0	0	0		0	0		0	0
2004	0	0	0	29	0	0	0	0	0	29
2005	32	32	0	0			162	325	194	357
1995-2004 Average	29	165	0	5	0	0	49	179	76	398
2000-2004 Average	17	74	0	6	0	0	32	40	42	112

Table 31.–Sport angler harvest and catch of lake trout in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2005.

	Kanektok River		Goodnews River		Arolik River		Other Locations		Kuskokwim Bay Total	
	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983									0	
1984							117		117	
1985							7		7	
1986							555		555	
1987							14		14	
1988							90		128	
1989			38				7		7	
1990							27	308	27	308
1991			0	38			171	631	171	669
1992							155	810	164	857
1993		18	9	29			104	496	104	496
1994							0	448	0	448
1995	80	90	20	38			27	125	127	253
1996	27	182	9	283			0	203	36	668
1997	113	154	23	211	0	0	137	499	273	864
1998	0	333	40	230	0	0	0	29	40	592
1999	0	33	25	450	0	0	0	9	25	492
2000	0	61	9	163	0	0	0	63	9	287
2001	0	19	9	152	0	0	0	0	9	171
2002	10	50	0	91	0	32	17	57	27	230
2003	0	30	59	2,352			0	0	59	2,382
2004	30	81	0	0			0	65	30	146
2005	18	72	0	0			0	0	18	72
1995-2004 Average	25	100	18	361	0	0	16	95	59	560
2000-2004 Average	10	52	13	460	0	0	3	31	25	548

Table 32.–Sport angler harvest and catch of lake trout in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Locations		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							419		419	
1984							545		545	
1985							10		10	
1986							555		555	
1987							14		14	
1988							91		91	
1989	63						7		70	
1990	18	475					27	308	45	783
1991							172	631	172	631
1992	47	555					155	810	202	1,365
1993		10					105	496	105	506
1994		0					0	448	0	448
1995	61	163					27	125	88	288
1996	9	54					56	203	65	257
1997	56	179	90	170	0	0	96	189	242	538
1998	9	62	67	282	0	0	15	44	91	388
1999	18	18	0	67	0	0	0	24	18	109
2000	9	27	0	9	0	0	28	120	37	156
2001	17	34	37	37	0	0	0	0	54	71
2002	0	58	17	57	36	181	54	975	107	1,271
2003	68	94	0	113			102	339	170	546
2004	30	45	0	0	60	60	0	33	78	138
2005	18	145	0	0			0	632	18	777
1995-2004 Average	28	73	26	92	14	34	38	171	95	376
2000-2004 Average	25	52	11	43	24	60	37	225	89	436

Table 33.–Sport angler harvest and catch of burbot in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2005.

	Aniak River		Kisaralik River		Kwethluk River		Other Locations		Lower Kuskokwim Total	
Year	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch	Harvest	Catch
1983							472		472	
1984							0		0	
1985							105		105	
1986							146		146	
1987							126		126	
1988							91		91	
1989							47		47	
1990							1,125	1,125	1,125	1,125
1991							40	50	40	50
1992							169	169	169	169
1993					107	107	107	107	214	214
1994							20	20	20	20
1995							0	0	0	0
1996							0	0	0	0
1997					180	180	0	0	180	180
1998							136	298	136	298
1999	13	13	0	0	76	76	139	139	228	228
2000	0	0	0	0	0	0	588	588	588	588
2001	0	0	0	0	0	0	50	50	50	50
2002	0	5	0	0	0	0	15	15	15	20
2003	0	0	0	0	0	0	87	97	87	97
2004		0		0		0	61	61	61	61
2005	0	0	0	0	0	0	50	50	50	50
95-04 Average	0	1	0	0	43	37	108	125	135	152
00-04 Average	0	1	0	0	0	0	160	162	160	163

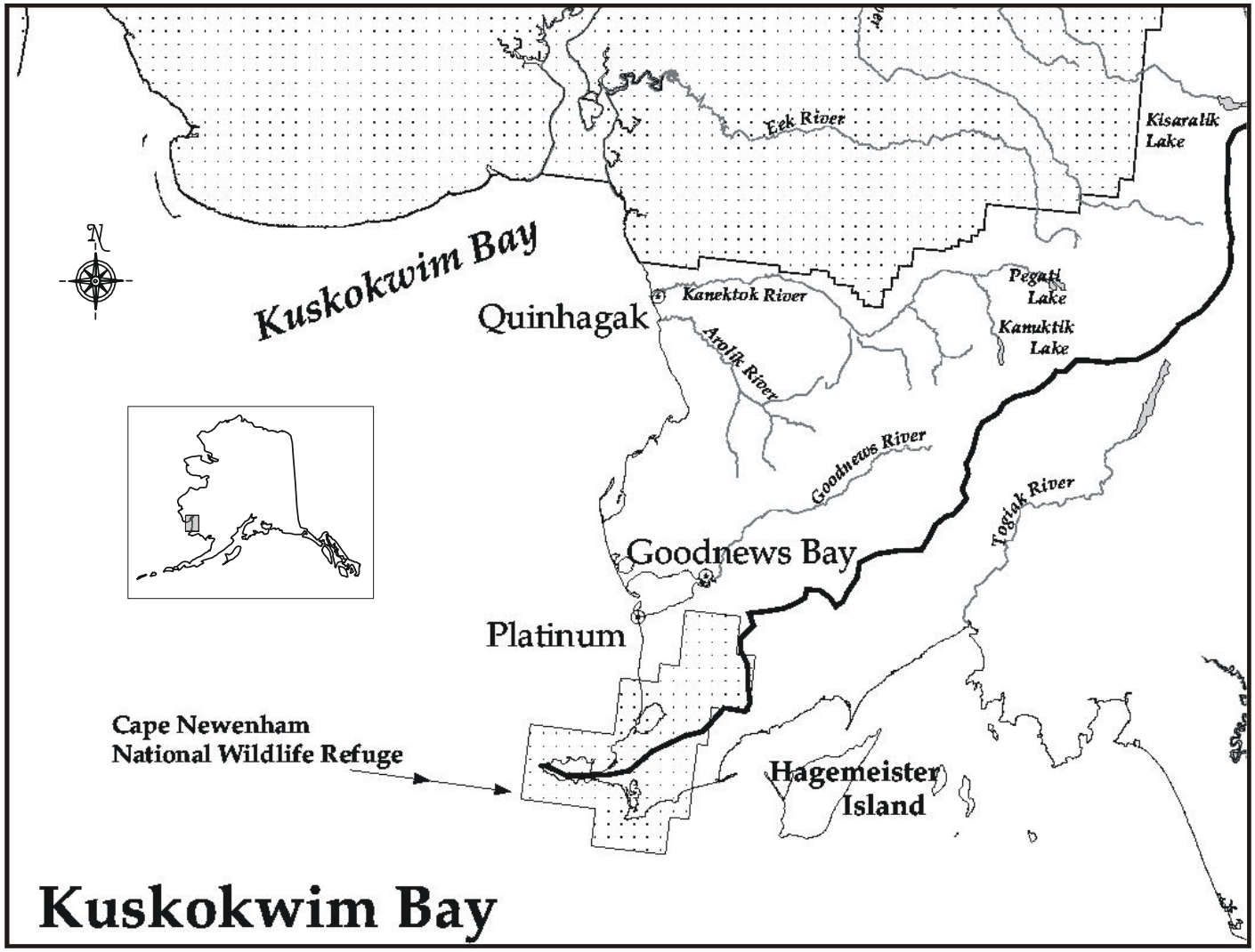

Figure 1.–Kuskokwim Bay area.

Figure 2.–Aniak River drainage.

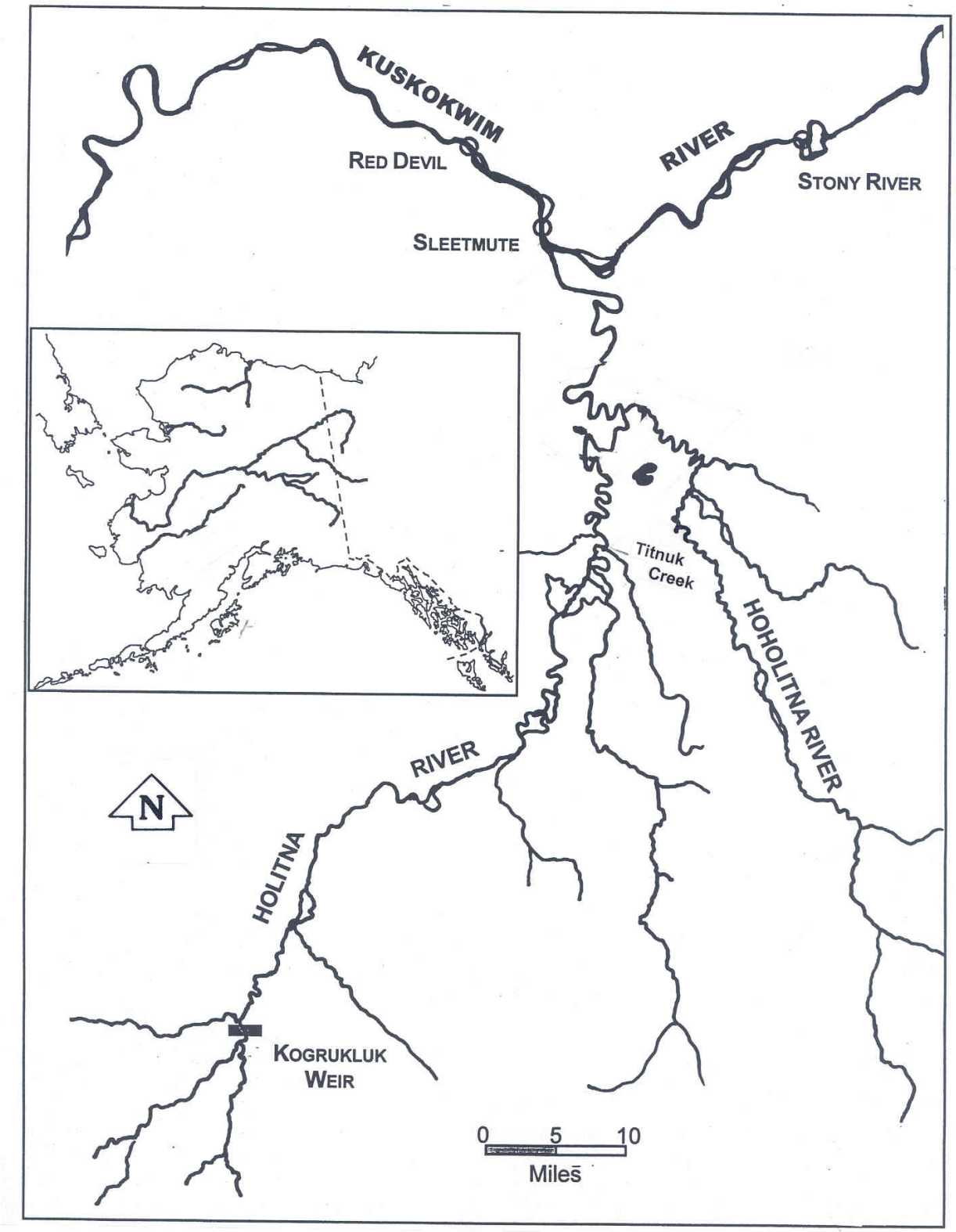

Figure 3.–Holitna River drainage.

APPENDIX A
LOWER YUKON/LOWER KUSKOKWIM MANAGEMENT AREA SPORT FISH EMERGENCY ORDERS ISSUED IN 2002-2005

Appendix A1.–Kuskokwim Management Area sport fish emergency orders issued in 2002-2005.

EO Number	Effective Dates	Action
EO 3-KS-01-02	June 15 – Dec. 31, 2002	Delayed the opening of king and chum sport fishery in the Kuskokwim River drainage until June 15 and reduced the king and chum salmon bag and possession limits to one king or one chum salmon.
EO 3-KS-01-03	June 15 – Dec. 31, 2003	Delayed the opening of king and chum sport fishery in the Kuskokwim River drainage until June 15 and reduced the king and chum salmon bag and possession limits to one king or one chum salmon.
EO 3-RS-09-03	July 12 – Dec. 31, 2003	Increased the bag and possession limit for Sockeye salmon in the Goodnews River drainage to 10 fish.
EO 3-KS-03-04	May 3-Dec.31, 2004	Reduced the bag and possession limits for king and chum salmon in the Kuskokwim River to either one king or one chum salmon per day.
EO 3-KS-05-04	Jun. 28-Dec 31, 2004	Restores the bag and possession limits to three kings per day in the Kuskokwim River, with only two over 28 inches, and five chum salmon, no size limit.

APPENDIX B
HOLITNA RESERVE DESIGNATION REQUEST

Appendix B1.–Holitna reserve considerations.

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL & GAS

FRANK H. MURKOWSKI, GOVERNOR

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PHONE: (907) 269-8800
FAX: (907) 269-8938

October 2, 2006

NOTICE OF ISSUANCE OF
HOLITNA BASIN EXPLORATION LICENSE BEST INTEREST FINDING

The Department of Natural Resources (DNR), Division of Oil and Gas (division) gives notice under AS 38.05.945 that it has denied an exploration license to Holitna Energy Company, LLC.

Best Interest Finding
On October 2, 2006 the division Director issued a final finding and decision under AS 38.05.035(e), with the concurrence of the DNR Commissioner. The finding sets forth the facts, policies and laws upon which the determination was made to deny the application.

The Best Interest Finding is available on the division's web-site: www.dog.dnr.state.ak.us/oil. Copies of the finding are also available for public review at the division's office in Anchorage and the following libraries: Aniak Public Library, Bethel Regional High School Library, George Willis School Library, Jack Egnaty, Sr. School Library, Aniak High School Library, Gusty Michael School Library, and Johnnie John, Sr. School Library. Individuals may obtain copies of the finding free of charge. To order, contact Allison Iversen by phone (907) 375-8237, fax (907) 269-3484 or e-mail Allison_Iversen@dnr.state.ak.us, or write to the division at 550 West 7th Avenue, Suite 800, Anchorage, AK 99501.

Reconsideration and Appeal
This Best Interest Finding is a final administrative decision of DNR. A person who is aggrieved by this finding may request the commissioner to reconsider the decision under AS 35.05.035(i) and (j). To be eligible an appellant must have meaningfully participated in the process to develop the finding by submitting written comments during the prescribed comment period or by presenting oral testimony at a public hearing. A request for reconsideration must be received by 5 p.m. local time, October 23, 2006. Requests for reconsideration must be addressed to: Michael Menge, Commissioner, Department of Natural Resources, 550 W 7th Avenue, Suite 1400, Anchorage, Alaska 99501; fax 1-907-269-8918; or e-mail dnr_appeals@dnr.state.ak.us. If the commissioner fails to act on the request for reconsideration by November 2, 2006, the request is considered denied.

A denial of a request for reconsideration is the final administrative decision for purposes of appeal to Superior Court. A person may appeal the Final Best Interest Finding to Superior Court only if the person was eligible to request, and did request, an administrative reconsideration of the finding by the commissioner. An appellant must initiate an appeal to the Superior Court within 30 days from the date of denial of that reconsideration or from the date of distribution of the denial decision, in accordance with the rules of court and to the extent permitted by applicable law.

The division complies with Title II of the Americans with Disabilities Act of 1990. This publication will be made available in alternative communication formats upon request. Please contact Allison Iversen at (907) 375-8237 to make any necessary arrangements.

William Van Dyke
Acting Director

"Develop, Conserve, and Enhance Natural Resources for Present and Future Alaskans."