

Fishery Management Report No. 04-03

**Fishery Management Report for Sport Fisheries in the
Lower Yukon and Lower Kuskokwim Management
Area for 2002-2003**

by
Robert Lafferty

March 2004

Alaska Department of Fish and Game

Division of Sport Fish



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2002-2003**

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EXECUTIVE SUMMARY

This document provides a wide array of information specific to the recreational angling opportunities that exist within the Lower Yukon and Lower Kuskokwim Management Area. Information specific to the proposals that the Board of Fisheries will address at the January 12-19, 2004 meeting are contained within numerous sections of this report. As a means to assist board members in acquiring information in a timely manner, Appendix C has been constructed (page 112). This table guides the reader to specific information contained within text, table, and graphic format that, hopefully will be useful in evaluating regulatory proposals.

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 Lower Yukon/Lower Kuskokwim Management Area (LYLK). 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 third of a series of Annual Management Reports (AMR) detailing the management activities of the Sport Fisheries in the LYLK rivers and Kuskokwim Bay area in 2003 and updating sport effort, catch and harvest information from the Statewide Harvest Survey for the year of 2002. Specific area sport fisheries management actions that occurred in 1999-2000 and 2001 are published in Lafferty (2000) and (2003), respectively. Similarly area sport fish management actions occurring in 2002 and 2003 are contained in this report.

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 LYLK. 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. The department regards this report as the most comprehensive source of sport fishing information for the Lower Yukon /Lower Kuskokwim Management Area. Funding support for the sole office located in Bethel is derived from Fish and Game general funds.

INTRODUCTION

This is the third AMR reporting fishery statistics for the sport fisheries of the LYLK. Prior to 2000, the LYLK was shared between the Southcentral and Arctic-Yukon-Kuskokwim (AYK) sport fisheries regions. This management area was created in part because of concerns by local residents regarding fish populations and increased development of sport fisheries. Previous information regarding this management area can be located in the AMRs of Bristol Bay and AYK.

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, current biological, social and land use 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 AMR.

Descriptions of the primary sport fisheries of the LYLK 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 both the Yukon and Kuskokwim rivers, 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 LYLK includes those drainages downstream from Paimiut on the Yukon River and downstream from the Aniak River on the Kuskokwim River and all drainages in Kuskokwim Bay (Figure 1). Additionally, the LYLK includes all drainages that flow into the Bering Sea from Cape Newenham to the south and including the Pastolik River drainage to the north; Nunivak, St. Matthew, and adjacent islands are also included within the area as well. The management area is slightly larger than the entire state of Ohio.

The LYLK is partitioned into three sections; the lower Yukon River (Figure 2), lower Kuskokwim River (Figure 3), and Kuskokwim Bay (Figure 4).

Within the LYLK are two National Wildlife Refuges, the Yukon-Kuskokwim Delta Refuge and the Togiak Refuge. The entire 26 million acres of the Yukon-Kuskokwim Delta Refuge is within the LYLK as are several thousand acres of the Togiak Refuge in the headwaters of Kuskokwim Bay streams.

REGULATORY PROCESS

The regulatory process for fisheries management in the State of Alaska has become increasingly complex in recent years. Currently, some wildlife and fisheries resources of the State are under dual management by state and federal authorities. The dichotomy between agencies is quite simple, the State of Alaska constitution recognizes that all citizens should have equal access to the resources of the state. The federal government's role is dictated by the Alaska National Interest Lands Conservation Act (ANILCA) where rural preference is given during periods of wildlife and fisheries resource shortages. This dual subsistence management system has been implemented while pending litigation between the State of Alaska and federal government continues. In the interim, both federal and state fishery and wildlife agencies are making efforts to cooperate regarding subsistence fish and wildlife resource management with memoranda of understanding and management protocols defining roles of each agency. Occasionally, consensus between state and federal managers is not achieved and separate regulations are generated within each agency's jurisdiction.

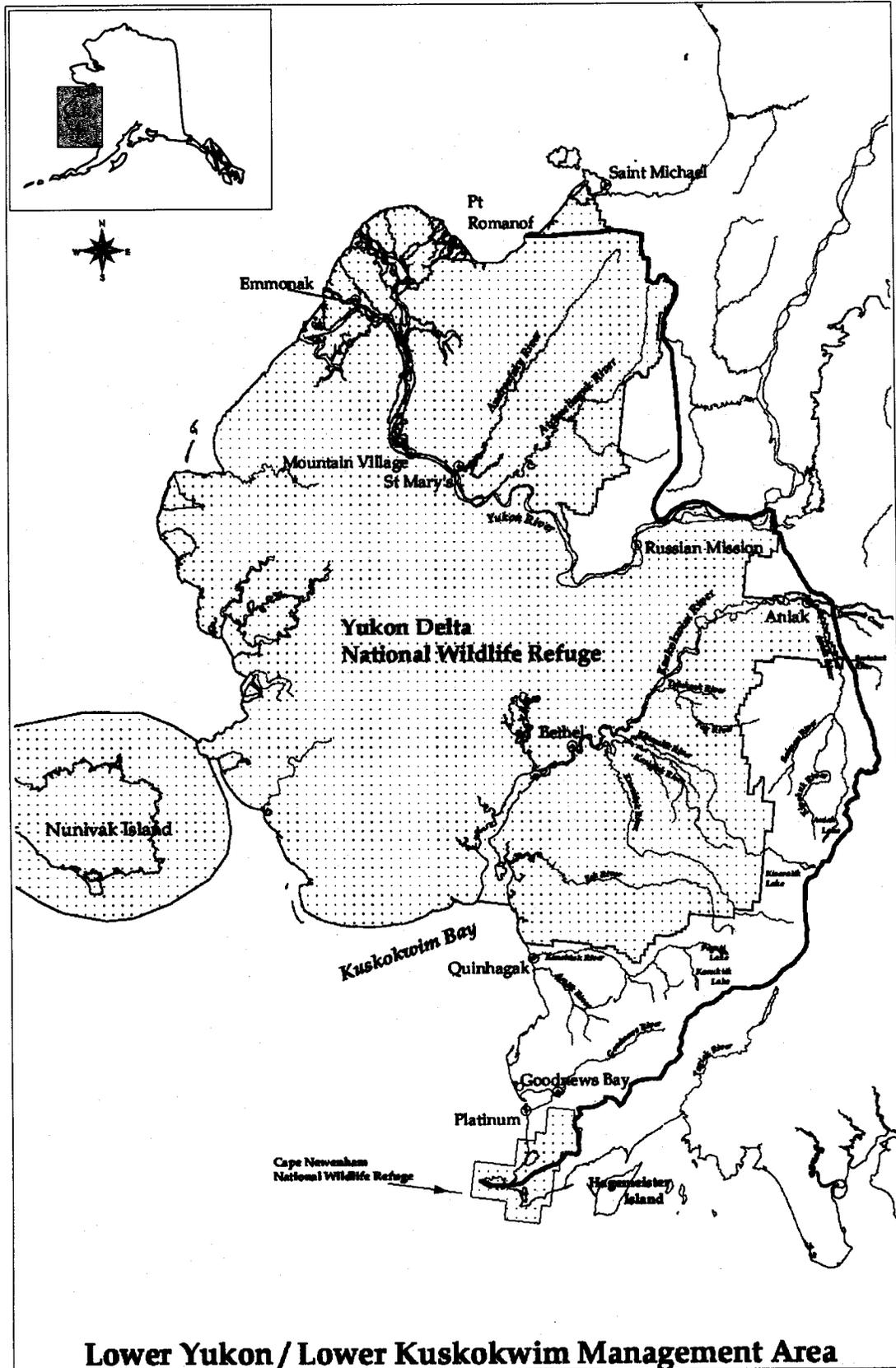


Figure 1.-Lower Yukon/Lower Kuskokwim area.

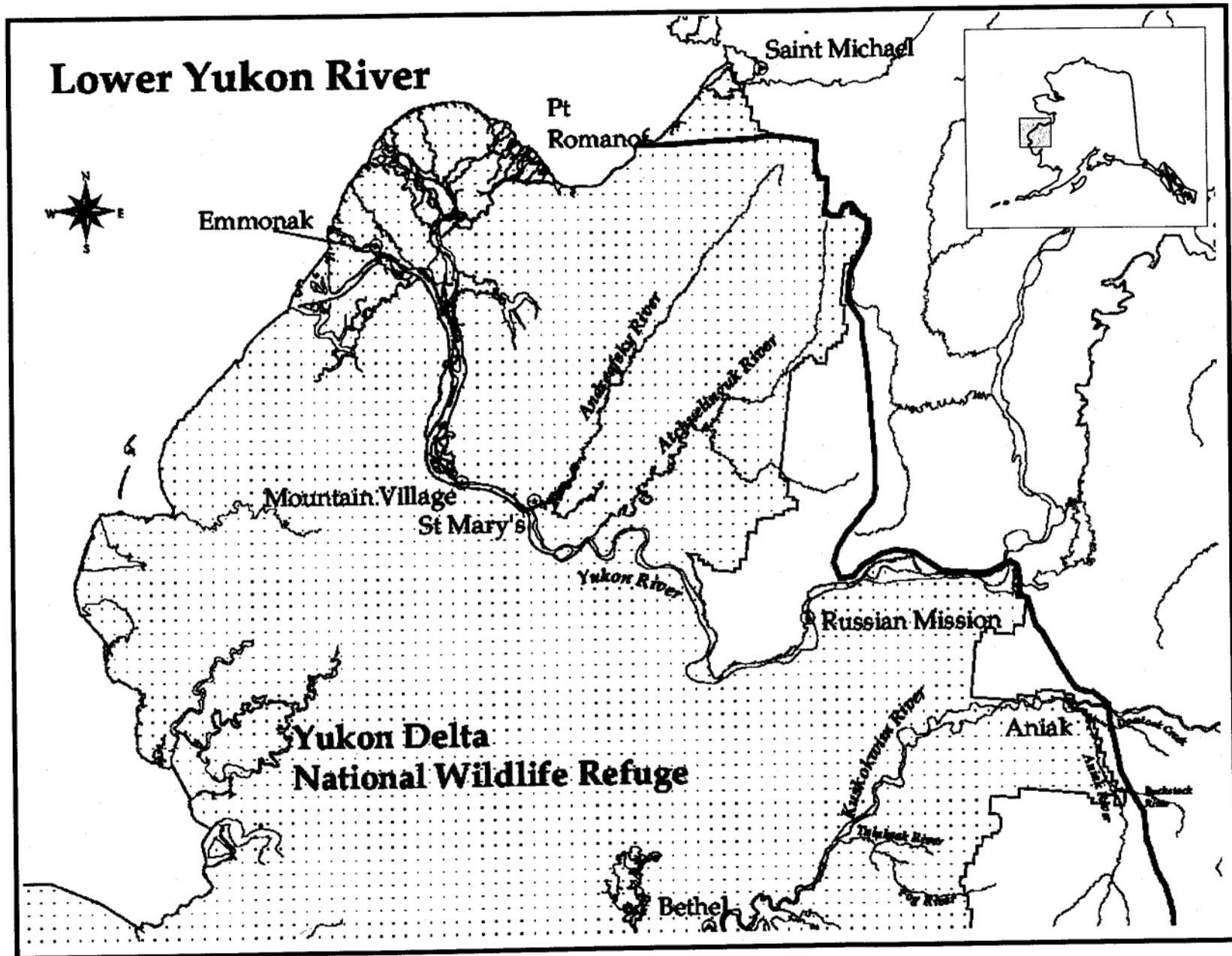


Figure 2.-Lower Yukon River area.

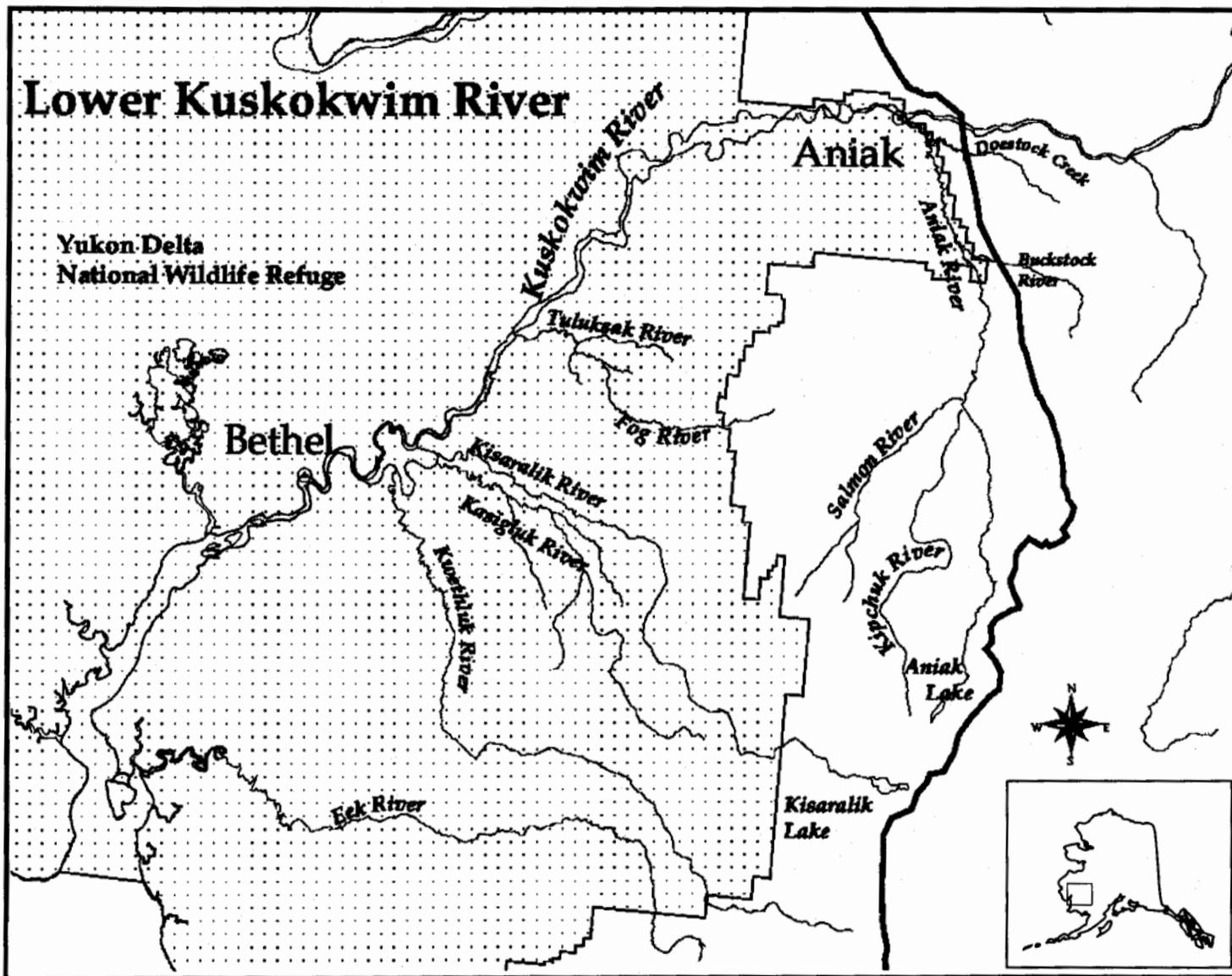


Figure 3.-Lower Kuskokwim River area.

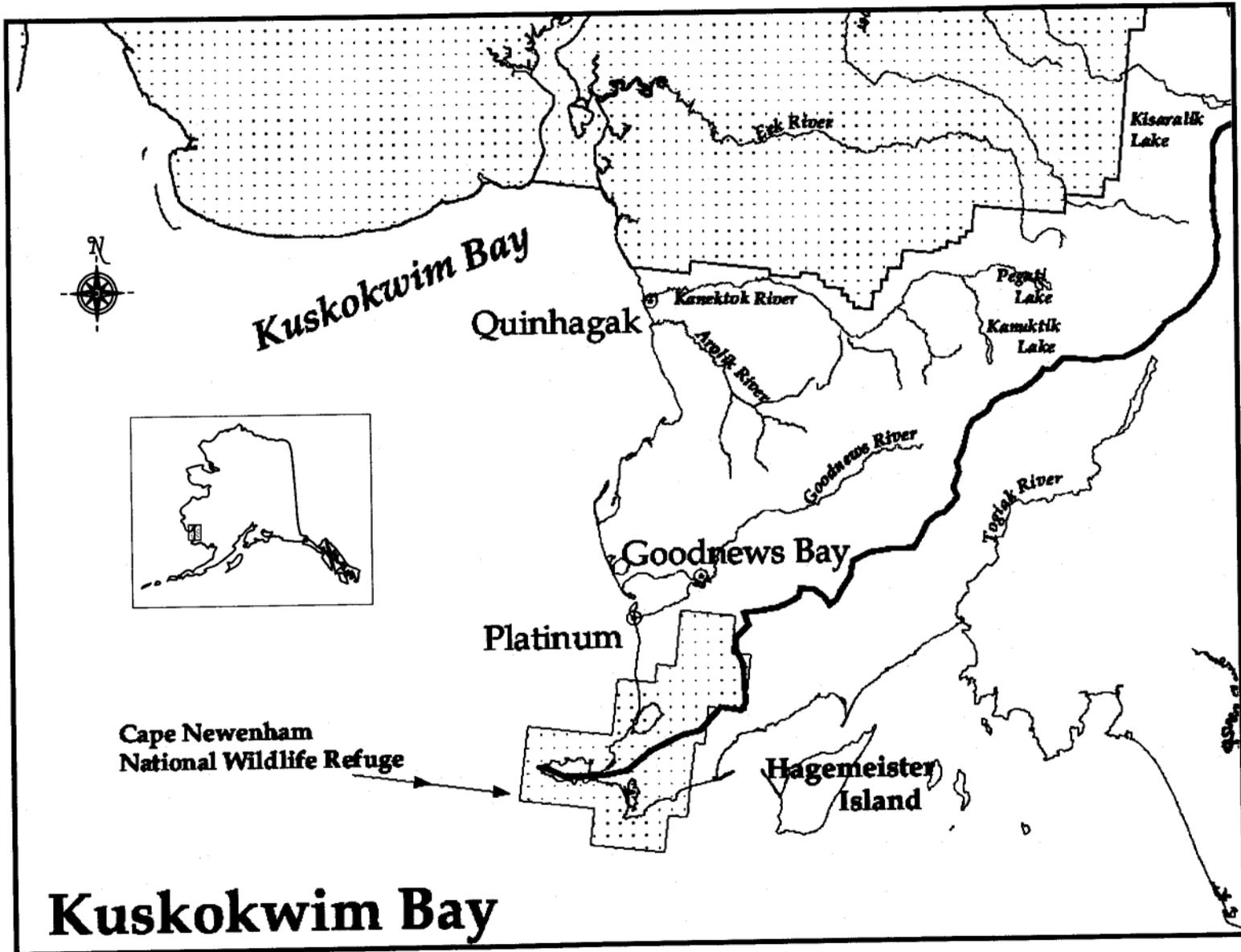


Figure 4.-Kuskokwim Bay area.

Within federal jurisdiction (federal lands and non-navigable waters adjacent to federal land holdings) rural subsistence priorities are the primary focus of federal managers. Federal managers are mandated to maintain healthy populations of wildlife and fish on federal lands and non-navigable waters with a rural subsistence priority. In 2000, the Secretary of the Interior began enforcing federal authority to protect subsistence to rural residents of the State of Alaska. Regional Advisory Councils (RACs) and the Federal Subsistence Board were created and members were appointed. This Board and the RACs began focusing on subsistence issues in rural areas of the state on federal lands and adjacent waters. The Federal Subsistence Board can supercede state regulations regarding subsistence with a special action.

In contrast, the state is mandated to manage for sustained yield based on the Alaska constitution for all residents of the state. Many of the fish and wildlife species in Alaska migrate vast distances and do not recognize the boundaries between state and federal authority. Therefore, both state and federal management agencies strive for consensus through cooperative efforts and agreed protocols for dual management of subsistence uses of fish and wildlife resources on their respective lands and waters within the State of Alaska.

Fish and wildlife managers of the department use biological and harvest information to determine levels of harvestable surpluses of fish and game or aquatic plant resources that are available. The Board of Fisheries (BOF) allocates surpluses through management plans and regulation development between user groups in Alaska on state lands and waters.

Fishing regulations, including subsistence, commercial, personal use and sport fishing fall under the authority of the BOF and are implemented by the department and enforced by the Department of Public Safety. When there is a need to adjust inseason harvest potential, the commissioner has authority to make specific changes to the regulations in the form of an emergency order (EO). Quite often, these emergency order (EOs) are framed within a management plan that has been approved by the BOF. Regional fishing regulations and management plans are reviewed on a three-year schedule. Fishing and hunting regulations under state authority are reviewed in a public forum. The BOF notifies the public by calling for proposals, these proposals are submitted to the BOF and then public comment is allowed for a given proposal. Comments are provided from the public in written or oral form during a local Fish and Game Advisory Committee (AC) or BOF meeting. The local advisory committees are intended to provide local input to propose regulations changes submitted by the public. Local AC's then vote on submitted proposals and make recommendations to the board. The AC's provide additional support to the BOF and Game by confirming conservation or development concerns at the local level. Often the chair of an advisory committee will report directly to the BOF during the public testimony segment of a scheduled meeting for that region of the state. There are currently 81 local fish and game advisory committees statewide divided into six regions across Alaska.

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 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 a statewide report is often published the following September or October. 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. This data is utilized to evaluate existing policies, prioritize project planning, and evaluate on regulation effectiveness.

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 1). 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. The recent decreasing statewide trend of effort observed during the late 1990s has just materialized in the Arctic-Yukon-Kuskokwim (AYK) region. Angler effort within the AYK region exceeded the 220,000 days in 2002. Since 1998, angler effort within the LYLK has averaged approximately 23,200 angler days. Recent regulation changes and circumstances have had a negative effect on participants in the area sport fisheries. In 2000, the BOF recognized rod and reel as subsistence method within the AVCP region, and this was extended to the whole Kuskokwim drainage in 2001. The federal government overstepped state subsistence management authority in 2001 in state waters adjacent to federal conservation zones in the Kuskokwim. The Yukon and Kuskokwim salmon declines were publicized nationally. A decline in the nation's economy has driven angler effort into a decline. These factors combined with recent national security issues and air travel have compounded the negative effect on participation in sport fisheries of the state, region and area.

SPORT FISHING HARVEST

Within the Kuskokwim and Kuskokwim Bay drainages recreational anglers primarily harvest salmon with resident species of secondary importance (Table 2). Coho salmon harvests exceed all other salmon species with an annual harvest range from 1,358 (1990) to 5,565 fish (1997) and averaging 3,500 coho salmon. The 2002 coho harvest of 4,300 was slightly above the average. In 2002, the chinook salmon annual harvest of 1,400 fish, was well within the historical range of 786 (1991) to 3,401 (1998) and slightly below the average of 1,800 chinook salmon. Dolly Varden/Arctic char harvests mirror chinook harvests, ranging from 800 to 3,500. Rainbow trout harvest for the entire area has dropped to less than a hundred, a substantial decline from the average annual harvest of 500 rainbow trout. This harvest decline in rainbow trout can 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 1,400 fish and northern pike with recent harvest of 500 fish (Table 2).

SALMON MANAGEMENT POLICY

Recent Changes

Significant additional policies were adopted into regulations to guide the BOF and department in sustainable salmon management (5 AAC 2000a) and in establishing salmon escapement goals (5 AAC 2000b) 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.

Table 1.-Annual sport fishing effort, in angler days, within the state of Alaska, Arctic-Yukon-Kuskokwim Region and Lower Yukon and Lower Kuskokwim Management Area waters as estimated by the SWHS, 1977–2002.

| Year | Statewide | AYK | | LYLK | |
|----------------|-----------|---------|---------|---------------------|---------|
| | | 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 ^b | 7.3 |
| 1985 | 1,943,069 | 186,883 | 9.6 | 12,484 ^b | 6.7 |
| 1986 | 2,071,412 | 194,713 | 9.4 | 11,842 ^b | 6.1 |
| 1987 | 2,152,886 | 217,109 | 10.1 | 18,958 ^b | 8.7 |
| 1988 | 2,311,291 | 233,559 | 10.1 | 26,171 ^b | 11.2 |
| 1989 | 2,264,079 | 239,626 | 10.6 | 18,907 ^b | 7.9 |
| 1990 | 2,453,284 | 245,629 | 10.0 | 15,858 ^b | 6.5 |
| 1991 | 2,456,328 | 219,922 | 9.0 | 13,055 ^b | 5.9 |
| 1992 | 2,540,374 | 181,852 | 7.2 | 14,404 ^b | 7.9 |
| 1993 | 2,559,408 | 220,972 | 8.6 | 14,505 ^b | 6.6 |
| 1994 | 2,719,911 | 209,987 | 7.7 | 18,117 ^b | 8.6 |
| 1995 | 2,787,670 | 270,141 | 9.7 | 16,289 ^b | 6.0 |
| 1996 | 2,006,528 | 201,166 | 10.0 | 16,420 ^b | 8.2 |
| 1997 | 2,079,514 | 238,856 | 11.5 | 27,318 ^b | 11.4 |
| 1998 | 1,856,976 | 227,841 | 12.3 | 27,913 ^b | 12.3 |
| 1999 | 2,499,152 | 304,522 | 12.2 | 26,563 ^b | 8.7 |
| 2000 | 2,627,805 | 241,574 | 9.2 | 20,030 ^b | 8.3 |
| 2001 | 2,262,346 | 194,531 | 8.6 | 20,673 ^b | 10.6 |
| 2002 | 2,259,091 | 220,276 | 9.8 | 20,645 ^b | 9.4 |
| Mean (All Yrs) | 2,070,389 | 205,770 | | 18,671 ^b | |
| Mean (93-02) | 2,365,840 | 232,947 | | 20,847 ^b | |
| Mean (98-02) | 2,301,074 | 237,670 | | 23,165 ^b | |

^a Specific SWHS data not available for the LYLK management area.

^b Does not represent SWHS data from the lower Yukon River from Paimiut to the mouth of the Yukon River.

Table 2.-Kuskokwim-Kuskokwim Bay drainage sport fish harvest by fish species, 1989-2002.

| Species | Year | | | | | | | | | | | | | |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
| Chinook Salmon | 2,237 | 897 | 786 | 1,046 | 1,674 | 2,148 | 1,328 | 2,439 | 3,345 | 3,401 | 1,400 | 1,181 | 1,384 | 1,397 |
| Coho Salmon | 4,282 | 1,358 | 2,087 | 2,033 | 2,056 | 2,978 | 2,771 | 5,231 | 5,430 | 4,897 | 3,974 | 3,294 | 4,474 | 4,265 |
| Sockeye Salmon | 291 | 620 | 214 | 189 | 715 | 894 | 277 | 752 | 1,181 | 1,867 | 1,154 | 822 | 422 | 267 |
| Pink Salmon | 191 | 347 | 36 | 219 | 27 | 126 | 16 | 167 | 75 | 133 | 0 | 10 | 11 | 143 |
| Chum Salmon | 2,571 | 749 | 647 | 927 | 731 | 1,626 | 455 | 517 | 384 | 596 | 520 | 359 | 176 | 598 |
| Rainbow Trout | 757 | 475 | 774 | 404 | 486 | 299 | 429 | 567 | 1,336 | 539 | 510 | 106 | 17 | 76 |
| Lake Trout | 1,086 | 72 | 272 | 356 | 218 | 40 | 215 | 126 | 404 | 141 | 128 | 152 | 63 | 134 |
| 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 | 1,612 | 1,698 | 2,026 |
| Arctic Grayling | 2,622 | 1,340 | 2,603 | 545 | 739 | 850 | 845 | 663 | 1,292 | 3,554 | 1,290 | 361 | 807 | 1,464 |
| Northern Pike | 1,785 | 231 | 2,018 | 752 | 995 | 828 | 655 | 344 | 408 | 2,711 | 548 | 531 | 474 | 443 |
| Whitefish | 571 | 88 | 158 | 286 | 253 | 183 | 0 | 20 | 614 | 1,220 | 9 | 214 | 20 | 54 |
| Burbot | 12 | 1,125 | 40 | 169 | 214 | 20 | 0 | 0 | 0 | 185 | 228 | 588 | 50 | 15 |
| Sheefish | 296 | 107 | 154 | 292 | 54 | 390 | 272 | 20 | 589 | 277 | 268 | 250 | 124 | 81 |
| Smelt | 1,324 | 211 | 0 | 1,136 | 3,343 | 2,292 | 633 | 1,313 | 27 | 3,333 | 0 | 68 | 0 | 0 |
| Halibut | 0 | 144 | 0 | 33 | 54 | 45 | 21 | 0 | 50 | 350 | 0 | 53 | 0 | 0 |

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 fresh water and marine environments. Salmon conservation and management are based on principles and specific criteria, including habitat protection, escapement levels, 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.

Yukon and Kuskokwim chinook and chum salmon stocks were recognized as stocks of yield concern. 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 Yukon and 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 only two sport fishing specific management plans for the LYLK, the Southwest Rainbow Trout Plan and Aniak River Plan. These plans address time, area, and method and means of harvesting salmon and resident fish species in designated waters. Quite often area sport fishing regulations are not considered in a management plan, but should be. The objectives are the same, 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 LYLK 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 Yukon and Kuskokwim rivers (5AAC 2000c and 5 AAC 2000d, respectively). There are eight salmon management plans that guide commercial fishing in the lower Yukon and lower Kuskokwim area. Six salmon management plans are focused on the salmon stocks of the Yukon River and two for the Kuskokwim area. In the Yukon River there are four specific salmon management plans and two salmon management plans directed at particular tributaries:

1. Yukon River King Salmon (5AAC 2000e);

2. Yukon River Summer Chum Salmon (5AAC 2000f);
3. Yukon River Fall Chum Salmon (5AAC 2000g);
4. Tanana River Salmon (5AAC 2000h);
5. Anvik River Chum Salmon (5AAC 2000i); and,
6. Yukon River Coho Salmon (5AAC 2000j).

In the Kuskokwim area, including streams in the Kuskokwim Bay, there are two salmon management plans:

1. Kuskokwim River Salmon (5AAC 2000k); and,
2. District 4 (Quinhagak) Salmon (5AAC 2000l).

Recent Changes

In October 2000, during a BOF work session, the department identified western Alaska salmon stocks of concern with chronic inability to achieve escapement goals. The BOF informed the department that these issues would be addressed during the January 2001 meeting under the new Sustainable Salmon Fisheries Policy. Five of the six salmon stocks identified with yield concern are in the LYLK: Kuskokwim River Chinook Salmon, Kuskokwim River Chum Salmon, Yukon River Chinook Salmon, Yukon River Summer Chum Salmon, and Yukon River Fall Chum Salmon.

Prior to the January meeting the BOF and department began a series of town meetings with local advisory committees to seek public input and suggestions for rebuilding Yukon and Kuskokwim chinook and chum salmon stocks. The department and BOF were seeking input regarding subsistence fishing opportunities that would be acceptable to the rural public that relies on the salmon stocks of Kuskokwim and Yukon rivers.

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 May 1-July 25 with a daily limit of 2 chinook salmon and annual limit of 2 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.

Prior to the recreational fishing season the Division of Sport Fish issued an EO in May of 2001 to reduce the daily bag and possession limit of chinook and chum salmon to reduce harvest

potential and bolster salmon escapements in the Kuskokwim. The federal government asserted its authority through the Federal Subsistence Board to restrict the uses of chinook and chum salmon to only residents of the drainage within their jurisdiction (lands and adjacent waters of the Yukon-Kuskokwim Delta Refuge). This action closed the sport fisheries for chinook and chum salmon in most tributary streams of the lower Kuskokwim and lower Yukon. However, the sport fishery remained open for all other species and the chinook and chum sport fisheries proceeded in state waters, unless in-season abundance indicated the likelihood of not meeting escapement objectives (Lafferty 2003; Appendices A and B).

Prior to these management modifications, Kuskokwim subsistence regulations within the AVCP region were modified to allow rod and reel method and means (5AAC 2000m) in March 2000. This action was extended to the whole Kuskokwim drainage during the summer of 2001. Unfortunately these actions have decreased the department's ability to monitor stock specific harvest of salmon and resident fish in the LYLK through the SWHS from Sport Fish Division. In the past, local residents of the AVCP region using rod and reel were required to purchase a sport-fishing license. By purchasing a license, license holders were included in the statewide postal harvest survey that estimated sport salmon and resident fish catch and harvest in a stock specific manner. A harvest survey conducted by Subsistence Division estimates the salmon harvests based on households, this is expanded to estimate community uses of fishery resources. Estimates of numbers and pounds of fish by species are sometimes calculated on a community basis. The survey results from Sport Fish and Subsistence divisions are substantially different; both surveys have different designs to estimate specific harvests. Eliminating the requirement of purchasing a sport fishing license when using rod and reel in the Kuskokwim has eroded the department's ability to determine stock specific harvests within the LYLK. This will have significant impacts to the department's ability to monitor stock specific harvests of resident fish and salmon with rod and reel in the future. Also, these rod and reel subsistence regulations complicate enforcement of sport fishing regulations since there is no requirement for identification for subsistence fishing.

During the spring of 2002, a preseason EO was issued to reduce the bag and possession limit in the sport fishery for king and chum salmon in the Kuskokwim River drainage (Appendix A). Additionally, the sport fishery was delayed until June 15 to provide the subsistence priority. Orutsararmuit Native Council (ONC) and Kuskokwim Native Association (KNA) submitted a special action for the Federal Subsistence Board to consider for king and chum salmon in the Kuskokwim. The Federal Subsistence Board accepted the request and restricted sport fishing for king and chum salmon in the Kuskokwim on June 26, 2002 (Appendix B). The department asked for reconsideration in early July and the Federal Subsistence Board rescinded its original special action based on improved salmon run strength. The chum salmon run into the Kuskokwim was sufficient to provide commercial opportunity, but there was no processor interest in chum salmon in 2002.

During the spring of 2003, a preseason EO was issued to reduce the bag and possession limit in the sport fishery for king and chum salmon in the Kuskokwim River drainage (Appendix A). Before mid July the sockeye escapement into the Goodnews Middle Fork weir was projected to exceed its escapement goal prior to the mid-point of the historic run timing. The escapement projection was beyond the escapement goal by more than 25%, allowing an increase in the bag and possession limit from five to ten sockeye salmon by EO.

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 accepted as legal method for subsistence uses 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 LYLK is under subsistence and sport fishing regulations. The subsistence regulations of the Kuskokwim and lower Yukon are an exception to resident species management throughout the state of Alaska. This is the only area of the state where a resident of Alaska can harvest unlimited quantities of resident fish, except rainbow trout and there are seasonal limitations on the Aniak River. The Aniak River has the only subsistence management plan in the LYLK. The only other plan guiding the management of resident fish, the Southwest Alaska Rainbow Trout Management Plan, encompasses a larger region of the State of Alaska. 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 (5 AAC 2000n). 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: 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.
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.

Implementation of this plan:

- 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.
- Established eight catch-and-release areas.
- Established six fly-fishing catch-and-release only areas.

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 PUMP review process. Public review was planned for 1999, however this review was postponed anticipating the 1999 Togiak Refuge CCP. Present work is incorporating findings from both plans. Occasional differences of opinion occur between the state and USF&W regarding management authority on the Togiak Refuge, these are generally minor and are quickly remedied.

BIOLOGICAL, SOCIAL AND LAND USE ISSUES

Frequently social issues drive precautionary sport fishing restrictions with little information in the LYLK management area. The majority of the rural residents are subsistence users and some have expressed resentment toward sport anglers, sport fisheries and catch-and-release practices. Traditional Yup'ik culture believes that the practice of catch-and-release is disrespectful to fish and hence takes this as an affront to cultural teachings. However, many of the small guiding services that reside in the area are witnessing increased tolerance for sport fishing in the area. Many elders and several village governments continue to submit recommendations to eliminate sport fisheries or restrict angler access via boat restrictions in some locations.

The land status surrounding the Arolik River continues to be in dispute between the federal and state governments. There are two issues the department's navigability team is addressing with the Arolik River.

1. The Bureau of Land Management (BLM) determined that portions of the Arolik River were non-navigable and under the Alaska Native Claims Settlement Act (ANCSA) conveyed shorelands 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 shorelands were not in federal ownership and were not BLM's to convey.
2. The Togiak National Wildlife Refuge continues to provide the federal viewpoint that Quanirtuuq Inc. has rights to these waters and shorelands, and is within their rights to provide exclusive use to several fishing services.

There is a long history of conflict between subsistence users in the upper and lower Kuskokwim drainage. Subsistence users in the lower portion of the river complete their subsistence harvest weeks earlier than subsistence users upstream. In the past commercial fishing was implemented in the lower river before many up-river subsistence users had begun their subsistence harvest or completed their harvest. This pattern of management increased frustration among users and led to the creation of the Kuskokwim Salmon Working Group as advisory panel of subsistence users, elders, commercial and sport fishers to work with the management authorities to attempt to reach consensus on fishery management actions in the Kuskokwim. The recent Kuskokwim rebuilding

plan provides equity to both upriver and downriver users by applying a set schedule for subsistence fishing during the months of June and July. Additionally, the commercial fishery in the Kuskokwim is temporarily closed during the months of June and July. The subsistence lifestyle of the lower Kuskokwim and Yukon rivers and of coastal inhabitants is closely tied to commercial fishing once subsistence needs are met.

Presently, there are no major access issues for sport fishing in the LYLK. However, residents of the area are concerned over sport use of the fishery resources within this management area even though the number of anglers is small. Often area residents submit fishery proposals that attempt to reduce angler's access through restrictive fishing regulations. As residents begin to understand that land managers govern angler access, the department will need to become more vigilant on changes of land use.

CURRENT MANAGEMENT AND RESEARCH ACTIVITIES

Sport fishing management and research have been extremely challenging in recent years in the LYLK. The division has continued to invest considerable amounts of time and expertise in the Federal Subsistence Program to provide funding for management and research projects in the LYLK. Sport Fish staff continues to play a vital role in Kuskokwim area projects, particularly with radio telemetry studies. The Holitna telemetry project evaluated the proportion of chinook, chum and coho salmon counted at the Kogrukluq weir operated by Commercial Fisheries during 2001 through 2003. 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. Also a rod and reel survey was conducted in the lower Aniak River to estimate the sport fishing effort, catch and harvest during 2001. These projects were cooperative projects with the Kuskokwim Native Association, Commercial Fisheries Division and received considerable funding from USFWS, Office of Subsistence Management. Findings and preliminary reports from these studies are readily available and will be presented during the 2004 BOF meeting.

Additionally, the division has focused on the recent charge from the BOF to develop a strategic research plan for chinook and chum salmon in the Kuskokwim River. Multiple divisions of the department participated in creating a draft research plan that targeted existing data gaps in the department's programs and understanding of Kuskokwim chinook and chum salmon stocks. This research plan (Merritt 2001) is attached to the action plans for Kuskokwim River chinook and chum salmon that was reviewed during the January 2001 BOF meeting. Local efforts are under way to broaden the research plan through the AYK Sustainable Salmon Initiative and National Research Council along with Yukon and Norton Sound salmon stocks.

ACCESS PROJECTS

There are currently no access projects in this management area. However, there are some concerns for angler access in the Kanektok River. The Quinhagak airport is being relocated away from the Kanektok River. Existing easements from the airport lands to the river will return to the land holdings of the Native Village of Kwinhagak (NVK) once the new airport is completed. This land status change has the potential to move the current access point for the angling public. Future anglers will likely be inconvenienced by needing to exit the river at the old boat harbor. The division will continue to monitor this issue and help provide options in the 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 is the sole local public contact that supplies local information and educational (I&E) needs. Local teachers, scouting groups and local fly fishers have contacted the Bethel office for assistance and support. The weekly fishing reports posted on the regional web site are the most current source of information to the angling public in the LYLK. 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. Work has begun toward developing an I&E plan for sport fisheries in the AYK region.

The Division of Sport Fish has also ventured in to a strategic planning with staff and public. This ongoing evaluation process has been instrumental for the public to understand and evaluate the performance goals of the division and the development of public input to ensure 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 (Mills 1977-1994; Howe et al. 1995, 1996, 2001a-d; Walker et al. 2003, Jennings et al. *In prep.*). 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 the strength 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, recognized by fishery managers that the smaller fisheries provide less precise estimates and 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 LYLK, the focus of the SWHS shifts 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.

- 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 a day, of which only one can be greater than 20 inches and only allowing the annual harvest of 2 rainbow trout over 20 inches. 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 were sunsetted 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) would be 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 around following the catch-and-release implementation of the Southwest Rainbow Trout Management Plan in the 1990s. The Aniak Sport fishery has achieved the dubious honor of 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 five-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 continues to be under review in 2003. 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

OVERVIEW OF AREA EFFORT

The sport fisheries began to develop in the LYLK 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 LYLK 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 3).

Angling effort in the LYLK 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 average about half of this amount. This decline can be attributed to decline of sport fishing licenses sold within the area to residents. 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 clearly 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.

Angler Effort in 2002

Angling effort in 2002 has stabilized within the range of 17,000 to 18,000 angler days (Table 3) in the Lower Kuskokwim and Kuskokwim Bay sport fisheries. The decline of approximately 5,000 angler days may be a result of the recent changes in subsistence regulations allowing rod and reel fishing without a sport fishing license and the combination of both declining chinook returns and national economy. This set of circumstances does not bode well in attracting anglers to the area. Near average effort was documented for Kuskokwim Bay streams and slightly above average effort on the lower Kuskokwim tributaries in 2002. Fluctuations of angler effort in the Goodnews River are probably a reflection of fishing services availability. Effort in the Kanektok River declined slightly below the historical average. The increase in effort in the Arolik is probably a response to angling services for this stream.

Angling effort in the Aniak River during 2002 was near the historic average (Table 3). The effort on the Kisaralik River was 1,000 angler days above average and broke the 2,400 angler days in 2002. The annual angling effort on the Kwethluk River is currently about 1,000 angler days. If we assume that most anglers are fishing on a weekly float trip, fishing for six days of the float trip, then the lower Kuskokwim had approximately 1,300 anglers and Kuskokwim Bay had approximately 1,700 anglers.

Observations of Angler Effort in 2003

Statewide estimates of 2003 effort will not be available until late 2004. Observations of angler effort can be characterized as average throughout LYLK. 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.

Table 3.-Angler effort (angler days) in the lower Kuskokwim River and Kuskokwim Bay area of Alaska, 1983-2002.

| Year | Kuskokwim Bay | | | | | Lower Kuskokwim River | | | | | Grand Total |
|------|---------------|----------|--------|-------|--------|-----------------------|-----------|----------|-------|-------|-------------|
| | Kanektok | Goodnews | Arolik | Other | Total | Aniak | Kisaralik | Kwethluk | Other | 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 |
| | | | | | | Average | | | | | |
| | 6,675 | 2,522 | 310 | 1,509 | 10,799 | 2,419 | 1,377 | 819 | 1,743 | 5,233 | 16,031 |

SECTION III – FISHERIES

SALMON FISHERIES

Chinook Salmon Fishery Description

Overview

Chinook salmon are present in most streams throughout the LYLK. 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 3) across all fish species. Very few chinook salmon are caught and harvested in the sport fisheries in the lower Yukon River tributaries.

The Yukon and Kuskokwim rivers 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), Jennings et al. (*In prep*). These estimates of harvest and catch are summarized in the previous AMRs (Lafferty 2001 and 2003). Additional Kuskokwim area commercial and subsistence harvest information for 2002 can be found in the Commercial Fisheries Division AMR (Ward et al. *In prep*) and 2003 information in Whitmore et al. (*In prep*) and the reports by Estensen (2003) for the Middle Fork Goodnews Weir project. Lower Yukon commercial and subsistence harvest information is reported in the Commercial Fisheries Division AMR (Vania et al. 2002) and BOF Reports (Vania 2000, Vania and Golembeski 2000). 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). Kenai Fishery Resources Office of USFWS reports salmon escapements of the east fork of the Andreafsky River, in the lower Yukon River (Zabkar and Harper 2001).

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. There are similar programs in the Yukon, but on a larger scale. The primary chinook salmon escapement programs in the Kuskokwim are aerial surveys, and the Kogrukluq 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.

Escapements of chinook salmon in the Yukon are monitored with test fishing, sonar, mark-recapture experiments, weirs, and counting towers. There are several Biological Escapement Goals (BEGs) for chinook salmon in the Yukon, including the Andreafsky River and a few in the Kuskokwim area. However, most of the Kuskokwim chinook escapement objectives are based

on aerial survey information. Often these aerial surveys are sporadic because of plane 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 2001, Federal Subsistence funds became available to assist in escapement evaluation in the Kuskokwim. Prior to the injection of this research money the department evaluated research needs for the Kuskokwim through a strategic planning exercise using the Analytic Hierarchy Process (Saaty 1990) utilizing software Expert Choice (Forman et al. 1983). Providing more escapement information was the primary result of the strategic planning (Merritt 2001). One of the 2001 projects was designed to evaluate the proportion of the Holitna escapement passing the Kogrukluk weir and the proportion below the weir (Wuttig and Evenson 2001). This tagging project is a major step in understanding chinook, chum and coho salmon production in the Holitna River. Because of the success of this project in 2001, it was continued in 2002 and 2003. Additionally, in 2002 mainstem mark-recapture project was implemented in 2002 to assess chinook, chum and coho salmon abundance upstream of Kalskag. This is a joint project with Commercial Fisheries to combine an existing coho fish wheel project with the telemetry work. Kuskokwim salmon escapement or weir projects in recent years are improving the department's ability to count escapement and are integral parts to understanding and complying with the sustainable salmon policy and the development of escapement objectives. However aerial surveys remain an important component of chinook salmon assessment in the Kuskokwim area (Table 4).

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;

Table 4.–Peak aerial survey index counts of chinook salmon in tributaries of the lower Kuskokwim River, 1975-2003.^a

| Year | EEK River | Kwethluk River | Kisaralik River | Tuluksak River | Aniak River | Kipchuk River ^b | Salmon River ^b |
|---------------------|-----------|----------------|-----------------|----------------|-------------|----------------------------|---------------------------|
| 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 |
| SEGC | | | | | | | |
| | | 1,200 | 1,000 | 400 | 1,500 | | 600 |
| Median ^d | | | | | | | |
| | 1,460 | | | | | 670 | |

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

^b Tributaries of Aniak River.

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

^d Median of years 1975 through 1994.

- 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 greater 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 5-7). However, there is angler desire to participate in the chinook fisheries of the Kuskokwim area (Tables 8 and 9). 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

Table 5.-Harvest of chinook salmon in the commercial, subsistence, test and sport fisheries of the Kuskokwim River, 1960-2003.

| 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 5.-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 | na | 409 | na | |
| | | | | | |
| 1993-2002 | | | | | |
| Average | 9,632 | 80,113 | 798 | 771 | 91,314 |
| Percent Harvest | 10.5% | 87.7% | 0.9% | 0.8% | |
| | | | | | |
| 1998-2002 | | | | | |
| Average | 4,534 | 72,859 | 311 | 480 | 78,184 |
| Percent Harvest | 5.8% | 93.2% | 0.4% | 0.6% | |

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 (1977-2002).

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

e. Estimated by proportion.

Table 6.-Harvest of chinook salmon in the commercial, subsistence, and sport fisheries and chinook salmon escapement in the Kanektok River, 1960–2003.

| Year | Harvest | | | Total | Escapement Index ^c | Minimum Total Run |
|------|-------------------------|--------------------------|-------|--------|----------------------------------|-------------------------|
| | Commercial ^a | Subsistence ^b | Sport | | | |
| 1960 | 0 | | | 0 | 6,047 | 6,047 |
| 1961 | 4,328 | | | 4,328 | | |
| 1962 | 5,526 | | | 5,526 | 935 | 6,461 |
| 1963 | 6,555 | | | 6,555 | | |
| 1964 | 4,081 | | | 4,081 | | |
| 1965 | 2,976 | | | 2,976 | | |
| 1966 | 278 | | | 278 | 3,718 | 3,996 |
| 1967 | 0 | 1,349 | | 1,349 | | |
| 1968 | 8,879 | 2,756 | | 11,635 | 4,170 | 15,805 |
| 1969 | 16,802 | | | 16,802 | | |
| 1970 | 18,269 | | | 18,269 | 3,112 | 21,381 |
| 1971 | 4,185 | | | 4,185 | | |
| 1972 | 15,880 | | | 15,880 | | |
| 1973 | 14,993 | | | 14,993 | 814 | 15,807 |
| 1974 | 8,704 | | | 8,704 | | |
| 1975 | 3,928 | | | 3,928 | | |
| 1976 | 14,110 | | | 14,110 | | |
| 1977 | 19,090 | 2,012 | | 21,102 | 5,787 | 26,889 |
| 1978 | 12,335 | 2,328 | | 14,663 | 19,180 | 33,843 |
| 1979 | 11,144 | 1,420 | | 12,564 | | |
| 1980 | 10,387 | 1,940 | | 12,327 | 6,172 | 18,499 |
| 1981 | 24,524 | 2,562 | | 27,086 | 15,900 | 42,986 |
| 1982 | 22,106 | 2,402 | | 24,508 | 8,142 ^d | 32,650 |
| 1983 | 46,385 | 2,542 | 1,511 | 50,438 | 8,890 | 59,328 |
| 1984 | 33,633 | 3,109 | 922 | 37,664 | 12,182 | 49,846 |
| 1985 | 30,401 | 2,341 | 672 | 33,414 | 13,465 | 46,879 |
| 1986 | 22,835 | 2,682 | 938 | 26,455 | 3,643 | 30,098 |
| 1987 | 26,022 | 3,663 | 508 | 30,193 | 4,223 | 34,416 |
| 1988 | 13,883 | 3,690 ^f | 1,910 | 19,483 | 11,140 | 30,623 |
| 1989 | 20,820 | 3,542 | 884 | 25,246 | 7,914 | 33,160 |
| 1990 | 27,644 | 6,013 | 503 | 34,160 | 2,563 | 36,723 |
| 1991 | 9,480 | 3,693 | 316 | 13,489 | 2,100 | 15,589 |
| 1992 | 17,197 | 3,447 | 656 | 21,300 | 3,856 | 25,156 |

-continued-

Table 6.-Page 2 of 2.

| Year | Harvest | | | | Escapement Index ^c | Minimum Total Run |
|----------------------|-------------------------|--------------------------|-------|--------|----------------------------------|-------------------------|
| | Commercial ^a | Subsistence ^b | Sport | Total | | |
| 1993 | 15,784 | 3,368 | 1,006 | 20,158 | 4,670 | 24,828 |
| 1994 | 8,564 | 3,995 | 751 | 13,310 | 7,386 | 20,696 |
| 1995 | 38,584 | 2,746 | 739 | 42,069 | | ⊗ |
| 1996 | 14,165 | 3,075 | 689 | 17,929 | 6,107 | 24,036 |
| 1997 | 35,510 | 3,433 | 1,632 | 40,575 | 8,080 | 48,655 |
| 1998 | 23,158 | 4,041 | 1,475 | 28,674 | | ⊗ |
| 1999 | 18,426 | 3,167 | 854 | 22,447 | 1,118 ^e | ⊗ |
| 2000 | 21,229 | 3,106 | 833 | 25,168 | 6,483 | ⊗ |
| 2001 | 12,775 | 2,923 | 947 | 16,645 | | ⊗ |
| 2002 | 11,480 | 2,475 | 779 | 14,734 | | |
| 2003 | 14,444 | | | | 5,430 | |
| 1993-2002 Average | 19,968 | 3,233 | 969 | 24,169 | | |
| Percent Harvest | 82.6% | 13.4% | 4.0% | | | |
| 1998-2002 Average | 17,414 | 3,142 | 978 | 21,534 | | |
| Percent Harvest | 80.9% | 14.6% | 4.5% | | | |

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

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

c. Unexpanded observed counts made from fixed-wing aircraft between 20 July and 5 August. Source: Burkey et al. 2001.

d. 1982 escapement survey after August 5, late for chinook salmon.

e. Escapement survey on July 14, before peak.

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

g. No total run estimate because of no escapement information or not appropriate survey date.

Table 7.-Harvest of chinook salmon in the commercial, subsistence, and sport fisheries and chinook salmon escapement in the Goodnews River, 1981-2003.

| Year | Harvest | | | Total | Escapement Index ^c | Minimum Total Run |
|-----------------|-------------------------|--------------------------|-------|--------|----------------------------------|-------------------------|
| | Commercial ^a | Subsistence ^b | Sport | | | |
| 1981 | 7,190 | 1,409 | | 8,599 | 11,454 | 20,053 |
| 1982 | 9,476 | 1,236 | | 10,712 | 4,332 | 15,044 |
| 1983 | 14,117 | 1,066 | 31 | 15,214 | 20,420 | 35,634 |
| 1984 | 8,612 | 629 | | 9,241 | 12,003 | 21,244 |
| 1985 | 5,793 | 426 | 323 | 6,542 | 10,810 | 17,352 |
| 1986 | 2,723 | 555 | | 3,278 | 6,186 | 9,464 |
| 1987 | 3,357 | 816 | | 4,173 | 6,762 | 10,935 |
| 1988 | 4,964 | 310 ^d | | 5,274 | 8,131 | 13,405 |
| 1989 | 2,966 | 467 | 68 | 3,501 | 4,806 | 8,307 |
| 1990 | 3,303 | 682 | | 3,985 | 11,292 | 15,277 |
| 1991 | 912 | 682 | 26 | 1,620 | 6,473 | 8,093 |
| 1992 | 3,528 | 252 | 23 | 3,803 | 3,757 | 7,560 |
| 1993 | 2,117 | 488 | 81 | 2,686 | 7,076 | 9,762 |
| 1994 | 2,570 | 657 | 163 | 3,390 | 11,722 | 15,112 |
| 1995 | 2,922 | 552 | 41 | 3,515 | 14,701 | 18,216 |
| 1996 | 1,375 | 526 | 157 | 2,058 | 8,907 | 10,965 |
| 1997 | 2,039 | 449 | 86 | 2,574 | 10,153 | 12,727 |
| 1998 | 3,675 | 718 | 431 | 4,824 | 8,381 | 13,205 |
| 1999 | 1,888 | 871 | 223 | 2,982 | 9,786 | 12,768 |
| 2000 | 4,442 | 703 | 243 | 5,388 | 6,876 | 12,264 |
| 2001 | 1,519 | 895 | 147 | 2,561 | 13,532 | 16,093 |
| 2002 | 979 | 857 | 224 | 2,060 | 7,172 | 9,232 |
| 2003 | 1,483 | | | | | |
| 1993-2002 | | | | | | |
| Average | 2,353 | 672 | 180 | 3,204 | 10,118 | 13,322 |
| Percent Harvest | 73.4% | 21.0% | 5.5% | | | |
| 1998-2002 | | | | | | |
| Average | 2,501 | 809 | 254 | 3,563 | 9,725 | 13,288 |
| Percent Harvest | 70.2% | 22.7% | 7.1% | | | |

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

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

c. Unexpanded observed counts made from fixed-wing aircraft between 20 July and 5 August. Source: Burkey et al. 2001.

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

Table 8.-Sport angler harvest and catch of chinook salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|----------------|--------|----------------|-------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 926 | 5,613 | 151 | 1,389 | 18 | 99 | 109 | 428 | 1,154 | 7,370 |
| 2000-2002 | | | | | | | | | | |
| Average | 853 | 6,914 | 205 | 1,963 | 25 | 150 | 0 | 81 | 1,083 | 9,109 |

Table 9.-Sport angler harvest and catch of chinook salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|--------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|--------|
| | 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 |
| Average | 369 | 2,681 | 37 | 271 | 31 | 139 | 106 | 315 | 390 | 3,227 |
| 2000-2002 | | | | | | | | | | |
| Average | 52 | 969 | 19 | 312 | 31 | 148 | 5 | 16 | 107 | 1,445 |

Kuskokwim River. Historically, these 3,000 anglers were harvesting 1,500 chinook salmon from a total catch of 10,600 chinook salmon during 1983-2002 (Tables 8 and 9). Harvests during the 2000-2002 have declined to 1,200 chinook and the total catch has maintained the historical average of 10,600 chinook salmon. It is doubtful that hooking mortality is a significant factor, all of the salmon delayed mortality studies associated 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 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.

Since 2000, the harvest of chinook salmon in the Kuskokwim River drainage sport fisheries has plummeted to several hundred a year, the recent three year average is just over 100 chinook salmon. Chinook harvests in the Kuskokwim Bay sport fisheries has remained stable at about 1,000 annually. Catches of chinook salmon in the sport fishery follow a general trend, for each chinook harvested, ten are caught and released in this area. The chinook salmon removal (harvest and delayed mortality) attributed to the sport fisheries of the area is approximately 2,000 king salmon.

Summary of 2003 Season

Following the Kuskokwim Salmon Rebuilding Plan and the action taken in 2002, the subsistence schedule was implemented on June 1 in the lower Kuskokwim. Additionally, the sport fishery was delayed by EO until June 15 in the Kuskokwim with a bag and possession limit of one chinook or one chum salmon (Appendix A). Subsistence catches in late May indicated that chinook salmon were entering the Kuskokwim early and with fair strength for that time of the year.

During the mid June, the chinook salmon catch indices of the Bethel Test Fishery (BTF) were exceeding the historical median. However, department staff believed these above average gillnet catches were the result of the low water conditions during early June. The tagging projects just upstream of Kalskag were catching average numbers of chinook salmon to maintain tagging objectives based on average run timing. No escapement weir projects were operational during mid June. With the opening of sport fishing on June 15, catch reports were good, but dependent on fishing conditions at tributary confluences. Sport fishing reports from the Kanektok were below average because of poor fishing conditions. Fishing improved later during the month of June as water levels rose.

By the end of June the BTF catch indices for chinook salmon remained above the historical median for this time in the run. Most of the escapement weirs were operational and counts of chinook salmon were slightly above average, except for the George River. High water conditions prevented operation of the George River weir until early July. Tagging projects just upstream of Kalskag were catching 2-3 times the number of chinook necessary to meet the tagging objectives. Sport fishing at mid Kuskokwim tributary confluences began to improve. Because of rising water conditions of the Kuskokwim, most guided sport fishing was occurring

in the lower reaches of the Kuskokwim tributaries. Many of the upper elevation lakes became ice-free prior to the end of June allowing access to most of the area float trip origins.

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, but only average in the mid and upper tributaries of the Kuskokwim. Sport fishing reports were average because of intermittent rainfall causing turbid fishing conditions.

Aerial surveys indexing spawning chinook salmon indicated average numbers in the upper survey streams and above average escapement indices in the mid and lower survey streams. In Kuskokwim Bay streams, aerial escapement surveys for chinook salmon indicated average escapement in both the Goodnews and Kanektok drainages.

Fishery Outlook

Lower Kuskokwim and Lower Yukon Rivers

Given the recent poor performances of chinook salmon returns in the Kuskokwim and Yukon rivers, a below average return is expected in 2004 for both drainages. The 2004 Kuskokwim and Yukon chinook returns are not expected to provide an adequate surplus for an historical average commercial harvest. The department's ability to forecast chinook salmon returns is very limited. However, staff remains hopeful that 2002 and 2003 chinook returns to the Yukon and Kuskokwim are indications of gradual improving run performance. The department believes the actions and direction of the BOF through the rebuilding process are necessary to improve escapement trends of chinook salmon in the Yukon and Kuskokwim drainages. The department is approaching the 2004 season with the expectation of limited commercial fishing in the Yukon. A commercial fishery for chinook salmon in the Kuskokwim is highly unlikely with current subsistence demands.

Kuskokwim Bay Tributaries

The 2003 chinook salmon escapement into the Goodnews River appears to be slightly below average, parental escapements of 1999 and 2000 were average and are expected to provide a surplus beyond escapement requirements and provide opportunity for both commercial and sport fishing. Escapement assessment of chinook salmon in the Kanektok River has been problematic. To address this issue Commercial Fisheries Division has begun operating an escapement weir during 2002 and 2003 field seasons 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. However, with the concern over western Alaska chinook salmon stocks, it is quite possible that both commercial and sport fishing restrictions may be enacted based on the combination of escapement abundance and commercial fishery performance.

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 10). 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. There are very few coho salmon caught and harvested in the sport fisheries in the lower Yukon River tributaries, downstream of Paimiut. However, there is local concern over developing sport fisheries throughout the area, including the Andreafsky River.

The Yukon and Kuskokwim river 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 (1983-1994), Howe et al. (1995, 1996, 2001a-d), Walker et al. (2003), and Jennings et al. (*In prep*). 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*) for the year 2002 and Whitmore et. al. (*In prep*) for 2003. The Kanektok River has the most complete commercial, subsistence, sport harvest and escapement information on coho salmon in the area (Table 11). 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).

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 subsistence and sport fisheries. Salmon escapement is monitored through aerial surveys, sonar, test fishing and weirs in the Kuskokwim drainage. There are similar programs in the Yukon, but on a larger scale. The primary coho salmon escapement programs in the Kuskokwim are aerial surveys, and Kogrukluq weir. The Bethel test fishery only provides indices of daily passage. Recent weir projects in the Goodnews, Kwethluk and Tuluksak rivers have been added to escapement assessment of the area. There is consideration for more weir operations in the future. Additionally, an investigative mark-recapture experiment was conducted in 2001, in the mainstem of the Kuskokwim River utilizing fish wheels to capture coho salmon upstream of Kalskag.

Escapements of coho salmon in the LYLK are monitored either with weir operations or aerial surveys from fixed wing aircraft. Aerial survey counts are unexpanded indices and represent

Table 10.-Harvest of coho salmon in the commercial, subsistence, test and sport fisheries in the Kuskokwim River, 1960-2003.

| Year | Harvest | | | | Total |
|-------------------|-------------------------|--------------------------|---------------------------|-------|---------|
| | Commercial ^a | Subsistence ^b | Test Fishery ^c | Sport | |
| 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 |

-continued-

Table 10.-Page 2 of 2.

| 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 | 286,350 | na | | na | |
| 1993-2002 Average | 364,691 | 31,030 | | 2,029 | 397,750 |
| Percent Harvest | 91.7% | 7.8% | | 0.5% | |
| 1998-2002 Average | 154,383 | 29,492 | | 1,868 | 185,743 |
| Percent Harvest | 83.1% | 15.9% | | 1.0% | |

^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 11.—Harvest of coho salmon in the commercial, subsistence, and sport fisheries and coho salmon escapement in the Kanektok River, 1983-2003.

| Year | Harvest | | | Total | Escapement Index ^c | Minimum Total Run |
|-----------------|-------------------------|--------------------------|-------|---------|----------------------------------|-------------------------|
| | Commercial ^a | Subsistence ^b | Sport | | | |
| 1983 | 32,442 | | 367 | 32,809 | | |
| 1984 | 132,151 | | 1,895 | 134,046 | 46,830 | 180,876 |
| 1985 | 29,992 | | 622 | 30,614 | | |
| 1986 | 57,544 | | 2,010 | 59,554 | | |
| 1987 | 50,070 | | 2,300 | 52,370 | 20,056 | 72,426 |
| 1988 | 68,605 | 4,317 ^d | 1,837 | 74,759 | | |
| 1989 | 44,607 | 3,787 | 1,096 | 49,490 | 1,755 | ^d |
| 1990 | 26,926 | 4,174 | 644 | 31,744 | | |
| 1991 | 42,571 | 3,232 | 358 | 46,161 | 4,330 | 50,491 |
| 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 | 2,900 | ^e |
| 1996 | 118,718 | 1,467 | 875 | 121,060 | 23,656 | ^f 144,716 |
| 1997 | 32,862 | 1,264 | 1,220 | 35,346 | 23,166 | ^g 58,512 |
| 1998 | 80,183 | 1,702 | 751 | 82,636 | 23,656 | 106,292 |
| 1999 | 6,184 | 2,021 | 1,091 | 9,296 | 5,192 | ^e |
| 2000 | 30,529 | 1,088 | 799 | 32,425 | 10,120 | ^f 42,545 |
| 2001 | 18,531 | 1,525 | 2,448 | 22,504 | 36,440 | ^h 58,944 |
| 2002 | 26,695 | 1,099 | 1,784 | 29,578 | 24,840 | ^h 54,418 |
| 2003 | 49,820 | | | | | |
| 1993-2002 | | | | | | |
| Average | 51,963 | 1,762 | 1,135 | 54,860 | | |
| Percent Harvest | 94.7% | 3.2% | 2.1% | | | |
| 1998-2002 | | | | | | |
| Average | 32,424 | 1,487 | 1,375 | 35,286 | | |
| Percent Harvest | 91.9% | 4.2% | 3.9% | | | |

^a Quinhagak (District 4) commercial harvest (Burkey et al. 2001).

^b Subsistence harvests by the community of Quinhagak (Burkey et al. 2001).

^c Unexpanded observed count made from fixed-wing aircraft between 20 August and 5 September. Source Burkey et al. 2001.

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

^e Considered early aerial survey, before peak spawning.

^f Incomplete aerial survey, poor survey conditions.

^g Escapement based on tower count ending August 21.

^h Weir count at river mile 42.

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 (Burkey et al. 2000) and begin the process to develop escapement objectives in accordance with the department's Escapement Goal Policy (ADF&G 2000).

Sport harvests of coho salmon are very small in comparison to the commercial and subsistence harvests in the area (Tables 10–12). 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 catch and releasing approximately 35,000 coho salmon (Tables 13 and 14). 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, 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 three-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 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

Table 12.-Harvest of coho salmon in the commercial, subsistence, and sport fisheries and coho salmon escapement in the Goodnews River, 1983-2003.

| Year | Harvest | | | Total | Escapement Index ^c | Minimum Total Run |
|-------------------|-------------------------|--------------------------|-------|--------|----------------------------------|-------------------------|
| | Commercial ^a | Subsistence ^b | Sport | | | |
| 1983 | 19,660 | | 168 | 19,828 | | |
| 1984 | 71,176 | | | 71,176 | 249 | |
| 1985 | 16,498 | 11 | 386 | 16,895 | 282 | |
| 1986 | 19,378 | 8 | | 19,386 | 163 | |
| 1987 | 29,057 | 43 | | 29,100 | 62 | |
| 1988 | 30,832 | 1,162 ^d | | 31,994 | 6 | |
| 1989 | 31,849 | 907 | 224 | 32,980 | 145 | |
| 1990 | 7,804 | 1,646 | | 9,450 | | |
| 1991 | 13,312 | 1,828 | 297 | 15,437 | 1,978 | |
| 1992 | 19,875 | 1,353 | 138 | 21,366 | | |
| 1993 | 20,014 | 1,226 | 189 | 21,429 | 1,451 | |
| 1994 | 47,499 | 512 | 170 | 48,181 | | |
| 1995 | 17,875 | 305 | 114 | 18,294 | 5,415 | |
| 1996 | 43,836 | 352 | 466 | 44,654 | 10,869 | |
| 1997 | 2,983 | 397 | 855 | 4,235 | 9,619 ^e | 13,854 |
| 1998 | 21,246 | 331 | 574 | 22,151 | 35,441 ^e | 57,592 |
| 1999 | 2,474 | 582 | 789 | 3,845 | 11,545 ^e | 15,390 |
| 2000 | 15,531 | 517 | 795 | 16,843 | 19,676 ^e | 36,519 |
| 2001 | 9,275 | 616 | 822 | 10,713 | 19,630 ^e | 30,343 |
| 2002 | 3,041 | 297 | 429 | 3,767 | 27,454 ^e | 31,221 |
| 2003 | 12,730 | na | na | | | |
| 1993-2002 Average | 18,377 | 514 | 520 | 19,411 | | |
| Percent Harvest | 94.7% | 2.6% | 2.7% | | | |
| 1998-2002 Average | 10,313 | 469 | 682 | 11,464 | 22,749 | 34,213 |
| Percent Harvest | 90.0% | 4.1% | 5.9% | | | |

^a Goodnews Bay (District 5) commercial harvest (Burkey et al. 2001).

^b Subsistence harvests by the communities of Goodnews Bay and Platinum (Burkey et al. 2001).

^c Majority of coho run not counted, except weir operations during 1997-2000 into October. No interpolation for 1992 and 1994 because of significant portions of high water effecting weir operations. Source Burkey et al. 2001.

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

^e Middle Fork Weir count only, operated through mid September or longer.

Table 13.-Sport angler harvest and catch of coho salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|----------------|--------|----------------|--------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 1,156 | 8,641 | 428 | 4,442 | 53 | 599 | 463 | 743 | 1,956 | 13,761 |
| 2000-2002 | | | | | | | | | | |
| Average | 1,677 | 15,302 | 682 | 8,122 | 7 | 654 | 0 | 74 | 2,366 | 24,152 |

Table 14.-Sport angler harvest and catch of coho salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|--------|
| | 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 |
| Average | 588 | 3,193 | 180 | 1,698 | 333 | 1,306 | 421 | 872 | 1,028 | 5,784 |
| 2000-2002 | | | | | | | | | | |
| Average | 483 | 6,179 | 187 | 1,867 | 203 | 1,208 | 32 | 155 | 905 | 9,409 |

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 2003 Season

Coho salmon began entering the lower Kuskokwim River prior to mid July, substantially earlier than historic run timing of mid July. Sport fishing for coho salmon improved rapidly at many tributary confluences in the lower Kuskokwim, by the end of July excellent fishing opportunities were being reported in the lower reaches of Kuskokwim tributaries. Prior to the first commercial fishing period on July 31 in the Kuskokwim River the BTF cumulative count was six times the historical median. Limited processor interests with low demand continue to plague area commercial fishery managers and fishers. Attempting to limit commercial fishing time to meet the limited processing capacity with uncertain effort is a difficult task with strong run strength.

Coho run strength at the historical midpoint of the Bethel Test fishery was double the historical median. Coho abundance at escapement weirs were tracking well above average. The strong coho run continued to provide excellent sport fishing conditions in Kuskokwim River tributaries. Several escapement weirs counted record numbers of coho salmon during the remainder of their operations in 2003.

The coho entry patterns in the Kuskokwim Bay lagged a little behind the Kuskokwim River. As mentioned previously coho escapement assessment has been limited in the Goodnews and Kanektok Rivers with weir operations. Since 1998 the Middle Fork Weir on the Goodnews has been assessing coho escapement for most of September. This year was a record escapement with over 50,000 coho salmon counted pass the Middle Fork weir. This trend of record escapement also occurred in the Kanektok River with a count exceeding 72,000 coho salmon, however the

data set is limited to the past three years. These escapement levels provided excellent sport fishing opportunities for sport fishing throughout the months of August and September in Kuskokwim Bay streams.

Overall, the 2003 coho runs appeared to be well above average with indications tracking near or close to a record run with historical escapements. This run strength provided excellent coho opportunities throughout the area during late July through September.

Fishery Outlook

Lower Yukon / Lower Kuskokwim/ Kuskokwim Bay

Recent trends in coho salmon production have provided surpluses for commercial and sport fisheries during the past ten years. Coho salmon returns to the area have become widely fluctuating during the last five years, particularly with the boomer return in 2003. The coho escapements of 1992, 1996 and 2003 have dominated coho production in the Kuskokwim in the recent past. Coho salmon return to the Kuskokwim area primarily at four years of age; the 2000 brood will be the main parent year for the 2004 return. Coho escapement assessment project in 2000 counted roughly average coho escapement levels. If these coho escapements are any indication of coho returns to the Kuskokwim area, then the department could expect an average return to the area. However, the department's forecasting ability for projecting coho salmon returns is less than exact during most years. Run strength is assessed by commercial fishery performance, test fishing and escapement assessment.

Chum Salmon Fishery Description

Overview

Yukon and 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 Yukon and Kuskokwim rivers; 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 in the Kuskokwim River 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 15). Since then, harvests declined to less than 500,000 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 minute in comparison to subsistence and commercial harvests (Table 15). However, the angler desire to participate in the chum salmon fisheries is great. Approximately 3,000 anglers are harvesting 800 chum salmon and catch and releasing 17,000 chum salmon (Tables 16 and 17). 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.

Table 15.-Harvest of chum salmon in the commercial, subsistence, test and sport fisheries in the Kuskokwim River, 1960-2003.

| Year | Harvest | | | | Total |
|------|-------------------------|--------------------------|------------------|--------------------|-----------|
| | Commercial ^a | Subsistence ^b | Test Fishery | Sport | |
| 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 |

-continued-

Table 15.-Page 2 of 2.

| Year | Harvest | | | | Total |
|-----------------|-------------------------|--------------------------|--------------|-------|---------|
| | Commercial ^a | Subsistence ^b | Test Fishery | Sport | |
| 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 | 2,760 | na | | Na | |
| 1993-2002 | | | | | |
| Average | 139,083 | 60,953 | 4,873 | 294 | 205,202 |
| Percent Harvest | 67.8% | 29.7% | 2.4% | 0.1% | |
| 1998-2002 | | | | | |
| Average | 49,111 | 56,262 | 1,430 | 129 | 106,932 |
| Percent Harvest | 45.9% | 52.6% | 1.3% | 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 16.-Sport angler harvest and catch of chum salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|----------------|--------|----------------|-------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 280 | 7,587 | 50 | 2,085 | 0 | 112 | 156 | 384 | 474 | 9,947 |
| 2000-2002 | | | | | | | | | | |
| Average | 240 | 9,145 | 44 | 3,497 | 0 | 205 | 0 | 78 | 284 | 12,925 |

Table 17.-Sport angler harvest and catch of chum salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|-------|
| | Harvest | Catch | Harvest | Catch | Harvest | Catch | Harvest | Catch | Harvest | Catch |
| 1983 | | | | | | | 369 | | 369 | |
| 1984 | | | | | | | 260 | | 260 | |
| 1985 | | | | | | | 75 | | 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 |
| Average | 192 | 2,332 | 10 | 670 | 23 | 481 | 151 | 650 | 298 | 3,640 |
| 2000-2002 | | | | | | | | | | |
| Average | 0 | 2,636 | 4 | 981 | 35 | 322 | 0 | 214 | 39 | 4,152 |

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 base management assumes that providing adequate / average 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. There are similar programs in the Yukon, but on larger scale. In the past, the primary methods 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. There is a mainstem Kuskokwim tagging project that is under development by Commercial Fisheries staff that may provide estimates of abundance above Kalskag in the future.

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-around. 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 three-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 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 the 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 2003 Season

Following Kuskokwim Salmon Rebuilding Plan and the action taken in 2002, the subsistence schedule was implemented on June 1 in the lower Kuskokwim. Additionally, by EO the sport fishery was delayed until June 15 in the Kuskokwim with a bag and possession limit of one chinook or one chum salmon (Appendix A).

The Bethel Test Fishery (BTF) caught chum salmon prior to mid June; these catches were consistent with subsistence harvest reports in the lower Kuskokwim River. By mid-June, test-fishing indices were slightly behind the historical median during early stages of the chum run. Substantial increases in the catch of chum salmon occurred during the end of June and continued into mid July with Bethel Test Fishery. By July 5 most subsistence users had reported they finished harvesting chum salmon in the lower river. The Kuskokwim Working Group suggested that subsistence schedule be lifted. Escapement projects had indications of above average abundance and Aniak Sonar was projecting meeting the escapement goal. By the end of July, Aniak sonar estimated 110,000 chum salmon above the escapement goal of 250,000 chum salmon. However, towards the end of July it became apparent that Kogrukluq weir would be 5,000 to 8,000 chum salmon short of its escapement goal of 30,000 chum salmon. The tagging project just upstream of Kalskag was catching average numbers of chum salmon to maintain tagging objectives based on average run timing. Although the sport fishery was opened on June 15, appreciable sport catches of chum were not reported until the beginning of July.

Concerns of poor chum salmon numbers were reported by a few sport guides in early July in the Kanektok River. Commercial harvests in the Quinhagak district were average through most of July. Escapement of chum salmon did improve during mid-July in the Kanektok River and escapement levels counted by the weir consistent between 2002 and 2003 with over 40,000 chum salmon.

By mid-August of 2003, the chum salmon run in the Yukon River was below levels for escapement and restrictions to subsistence were being implemented. On August 15, the sport fishery for chum salmon closed in the Yukon by EO (Appendix A). Near the end of August chum salmon run strength had improved to meet escapement objectives and the sport fishery was reopened by EO on August 24.

Fishery Outlook

Lower Yukon / Lower Kuskokwim/ Kuskokwim Bay

Recent trends in chum salmon production have provided limited surpluses for commercial and sport fisheries in the past ten years. The chum salmon harvests in the commercial fisheries in Kuskokwim Bay are incidental from directed fisheries at chinook, sockeye and coho salmon. Commercial harvests of Kuskokwim chum salmon in the 1990s have generally declined from harvests that occurred in the 1980s. Annual harvests have decreased by approximately 57% from the 1980s to 1990s where median harvests in the 1980s were 420,000 chum salmon; the median harvests in the 1990s were 240,000. Similar declines have been seen in both the summer and fall chum salmon runs of the Yukon River. The Yukon and Kuskokwim chum salmon runs are typically age-4 and age-5. The parent year escapements of 1997 and 1998 were considered adequate (meeting BEGs) or above average for providing chum salmon surplus for 2002. However, parent year escapements from 1993 to 1995 were considered adequate or above average in the Kuskokwim and Yukon rivers, but expected returns from these broods have not materialized. There are a myriad of climatic conditions that effect salmon survival in both freshwater and marine environments. Unfortunately, the department has little information on these weather-induced phenomenon's on juvenile salmon either in freshwater or marine environments. Poor Yukon and Kuskokwim chum salmon performance prompted the BOF to initialize conservative management plans that emphasize stock rebuilding by ensuring adequate escapements in reductions to historical harvests. Therefore the outlook for chum salmon in the Kuskokwim and Yukon rivers is below average and the department continues to classify these stocks as yield concern under the sustainable salmon policy.

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 18). 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 thousands 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 19). Rarely does the sport harvests of sockeye salmon in the Kuskokwim drainage exceed 200 fish with catches less than 500 sockeye a year (Table 20). 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

Table 18.-Harvest of sockeye salmon in the commercial, subsistence, test and sport fisheries in the Kuskokwim River, 1960-2003.

| Year | Harvest | | | | Total |
|------|-------------------------|--------------------------|---------------------------|--------------------|---------|
| | Commercial ^a | Subsistence ^b | Test Fishery ^c | Sport ^d | |
| 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 | | | | 33,154 |
| 1983 | 68,855 | | | 41 | 68,855 |
| 1984 | 48,575 | | | | 48,575 |
| 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 |

-continued-

Table 18.-Page 2 of 2.

| 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 | 50,065 | | 231 | 50,175 |
| 2002 | 84 | 26,610 | | 26 | 26,694 |
| 2003 | 280 | na | | na | |
| 1993-2002 | | | | | |
| Average | 45,500 | 38,434 | | 149 | 87,079 |
| Percent Harvest | 52.3% | 44.1% | | 0.2% | |
| 1998-2002 | | | | | |
| Average | 27,337 | 41,295 | | 56 | 68,746 |
| Percent Harvest | 39.8% | 60.1% | | 0.1% | |

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 (1977-2002).

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

Table 19.-Sport angler harvest and catch of sockeye salmon in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|----------------|-------|----------------|-------|--------------|-------|--------------|-------|---------------------|-------|
| | 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 |
| Average | 268 | 2,565 | 141 | 1,365 | 2 | 115 | 119 | 281 | 507 | 4,124 |
| 2000-2002 | | | | | | | | | | |
| Average | 283 | 2,846 | 113 | 1,746 | 2 | 115 | 4 | 145 | 401 | 4,813 |

Table 20.-Sport angler harvest and catch of sockeye salmon in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|-------|
| | 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 |
| Average | 74 | 218 | 9 | 185 | 5 | 44 | 10 | 39 | 80 | 300 |
| 2000-2002 | | | | | | | | | | |
| Average | 24 | 187 | 11 | 96 | 0 | 49 | 11 | 45 | 43 | 361 |

sporadically throughout the drainage. 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. (*In prep*). 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. (*In prep*).

Sockeye management of Kuskokwim Bay is outlined under the District 4 Salmon Management Plan (5 AAC 2000L), sockeye management in Goodnews Bay, district 5 follows a similar regulation pattern, although there is no formal management plan (Ward et. al. *In prep*) and Whitmore et al. (*In prep*). 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. Seeking 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, 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) and Estensen (2003). Salmon escapement objectives for the Goodnews River have been 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 2003 Season

Both the Kuskokwim and Kuskokwim Bay streams received an above average return of sockeye salmon in 2003. Before mid-July the sockeye escapement into the Goodnews Middle Fork weir was projected to exceed its escapement goal prior to the mid point of the historic run timing. The escapement projection was beyond the escapement goal by more than 25%, allowing an increase in the bag and possession limit from five to ten sockeye salmon by EO (Appendix A). In other locations in the area, anglers were reporting above average catches of sockeye salmon during the month of July. Sport fishing was hampered by extended periods of rainfall, making fishing difficult. Because of the declining profitability in commercial fishing the harvests of sockeye salmon were below the ten-year average (63,000 and 40,000, respectively) in both Quinhagak and Goodnews Bay districts. The Quinhagak harvest was less than 34,000 sockeye and less than 30,000 sockeye for Goodnews Bay.

In the Kuskokwim, subsistence fisherman commented on the abundance and large size of sockeye salmon during early July.

Fishery Outlook

Lower Kuskokwim and Kuskokwim Bay

The department's ability to forecast salmon returns is very limited. Sockeye salmon in the area primarily return at 5 years of age. The parent escapement of 1999 in the Goodnews was above average and should produce adequate run strength for escapement, subsistence and other uses in 2004. The department has little additional information to make sockeye return projections at this time.

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 (5 AAC 75.013) 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. Current catches are averaging approximately 8,400 a year with virtually no harvest being reported during 2000-2002 (Table 21). 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 3), from the stable levels of 7,000 to 9,000 angler days, since 1996. This slight decline is likely in response to the downturn in nation’s economy and recent security issues with air travel. Overall, the 2002 catch in Kuskokwim Bay rainbow trout fisheries is up by approximately 4,000 fish over the 2001 catch; this can be attributed to good fishing conditions throughout most of 2002. 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 and Southwest Alaska. 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 rapid increase from 1,500 angler days in 1983 to over 12,000 angler days in 1988 (Table 3). Since 1988, the effort fluctuated from 3,000 to 9,000 and most likely reflects the availability of guiding services. In 2002, the effort was estimated to be less than 6,000 angler days. In recent years, angler effort has remained steady with approximately 8,000 angler days in the Kanektok, and the Goodnews River has approached the 8,000-angler day level during 1999. Currently, effort has dropped by 25% to less than 6,000 angler days in the Kanektok River and effort has remained steady in the Goodnews River. Angler effort in the Aniak sport fisheries was greater than 5,500 during 1997 and 1998 but has declined to half of this level since 2000. Angler effort is directed primarily towards chinook and coho salmon but rainbow trout is an important attraction.

Total area-wide rainbow trout sport harvests have rarely exceeded 1,500 fish as seen in 1988, and the recent three-year average is less than 100 rainbow trout (Tables 21 and 22). 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

Table 21.-Sport angler harvest and catch of rainbow trout in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|----------------------|----------------|--------|----------------|-------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 169 | 8,371 | 134 | 3,403 | 7 | 1,122 | 130 | 727 | 402 | 12,756 |
| 2000-2002 Average | 0 | 7,616 | 11 | 2,558 | 0 | 743 | 4 | 410 | 14 | 11,327 |

Table 22.-Sport angler harvest and catch of rainbow trout in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|--------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|--------|
| | 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 |
| Average | 63 | 3,274 | 60 | 3,008 | 73 | 928 | 149 | 1,130 | 243 | 6,595 |
| 2000-2002 | | | | | | | | | | |
| Average | 8 | 2,951 | 25 | 3,202 | 14 | 1,783 | 5 | 428 | 52 | 8,363 |

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 on the 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 (Harper, U.S. Fish and Wildlife Service, 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 and area rainbow trout stocks continue to be conservatively managed under the Southwest Alaska Rainbow Trout Management Plan.

Sport fishing effort, catch and harvest are estimated by the SWHS (Mills 1979-1994; Howe et al. 1995, 1996, 2001a-d; Walker et al. 2003, and Jennings et al. *In prep*). 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 around and 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 gillnet.

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 over 20 inches.

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 (5 AAC 2000n). 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:

- 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;
- Establish eight catch-and-release areas;
- Establish six fly-fishing catch-and-release only areas; and,
- Establish eleven unbaited single-hook artificial lure only areas to protect rainbow trout stocks in Southwest Alaska.

In 1990, the Aniak River drainage (Figure 5) was effected 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 over 20 inches.

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 Rainbow Trout Management Plan (5 AAC 2000n) 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 concern 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 one year; the BOF addressed this plan during the January 2001 meeting.

During the 2001 January BOF meeting additional regulations were adopted to protect lower Kuskokwim rainbow trout in the sport fishery. Catch-and-release regulations are in currently

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.

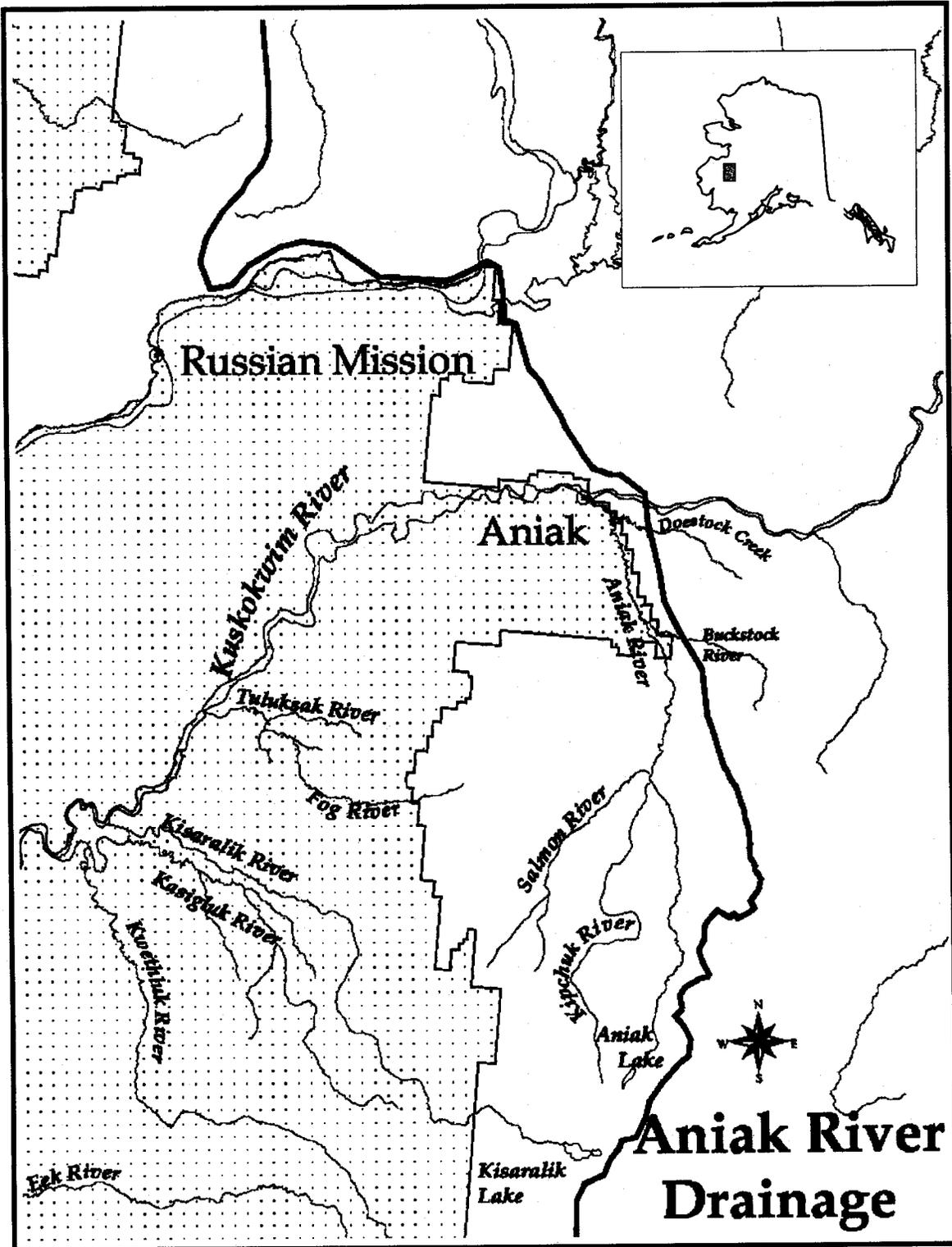


Figure 5.-Aniak River drainage.

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 2003 Season

Low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. These conditions eroded 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 only average 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. Fall fishing was reported as excellent to above average because of the favorable fishing conditions and the large return of coho salmon.

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. Rainbow trout greater than 25 inches are occasionally caught. The outlook for rainbow trout stocks in the Kuskokwim area is good, however, the BOF needs to recognize there is a conflict between legal gear for sport anglers and subsistence rod and reel fishers. In the short term the impacts are 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 that merge with existing regulations for rainbow trout stocks not under special management and will be addressed during the January 2004 BOF meeting.

There are currently no major biological concerns for rainbow trout fisheries in the LYLK. However, the BOF and department need to pay close attention to sport and subsistence harvests to ensure the health of these local stocks. Area stocks should continue to provide good angling opportunities for the 2004 season.

Dolly Varden/Arctic Char Fishery Description

Overview

Dolly Varden / Arctic char, hereon referred to as DV/AC, of the LYLK 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 strictly freshwater residents. 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 LYLK, 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 23 and 24). 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 LYLK 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 LYLK. 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 23 and 24).

Table 23.-Sport angler harvest and catch of Dolly Varden / Arctic char in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok Rivers | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|-----------------|--------|----------------|--------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 774 | 15,180 | 480 | 10,903 | 23 | 1,094 | 313 | 1,268 | 1,454 | 27,017 |
| 2000-2002 | | | | | | | | | | |
| Average | 486 | 14,906 | 580 | 12,824 | 28 | 662 | 23 | 743 | 1,117 | 29,134 |

Table 24.-Sport angler harvest and catch of Dolly Varden / Arctic char in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|--------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|--------|
| | 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 |
| Average | 331 | 6,671 | 262 | 2,972 | 68 | 418 | 341 | 1,400 | 691 | 9,929 |
| 2000-2002 | | | | | | | | | | |
| Average | 113 | 4,493 | 344 | 3,537 | 44 | 820 | 4 | 359 | 599 | 10,522 |

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 one 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 2000o) and sport (5 AAC 2000p) anglers. A three 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.

Current Kuskokwim Dolly Varden/ Arctic char regulations:

Aniak River

- In all flowing waters of upstream of the Doestock Creek, only unbaited, single-hook artificial lures may be used.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one Dolly Varden / Arctic char a day with 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 in flowing waters of the drainage is five Dolly Varden / Arctic char a day, only one over 20 inches a day.
- 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, only two over 20 inches a day.
- Bag and possession limit in lakes is two Dolly Varden / Arctic char 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 2003 Season

Low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. These conditions eroded 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 catches of DV/AC in area streams through the summer months. Fall fishing was reported as excellent-to-above average because of the favorable fishing conditions and the large return of coho salmon.

Several guiding services mentioned their concern for larger DV/AC greater than 18 inches. Fish of this length are beginning rebuild and several sport fishing services would support reducing the harvest of DV/AV greater than 18 inches in length. Unfortunately, these comments were made after the deadline for BOF proposals. The lack of bag and possession limits for the subsistence rod and reel fishery is of concern to managers of resident fish species. Although no abuses were reported there is concern on how healthy resident fish stocks can be maintained with sustainable bounds with unrestricted harvests and no real stock specific harvest monitoring system in place.

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. In contrast, current rod and reel subsistence fisheries are not regulated and have no bag or possession limits. There is very limited monitoring of subsistence harvest and these rod and

reel subsistence fisheries have the potential of over-exploiting local stocks. In order to provide sustainable yields resident fish populations require extensive periods of rebuilding once over-exploitation has been documented and regulatory protection enacted. With increasing restrictions in salmon fisheries in the Kuskokwim area, local people will likely rely on resident fish to help meet their subsistence needs. It is therefore critical that the department closely monitor subsistence harvests of resident fish stocks.

There are currently no major biological concerns for DV/AC fisheries in the LYLK. Area stocks should continue to provide good angling opportunities for the 2004 season.

Arctic Grayling Fishery Description

Overview

Arctic grayling are probably the most widely distributed and abundant resident fish in the LYLK. 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. Although the grayling stocks are perceived to be large, anglers often 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 LYLK are less than 500 fish, a 50% decrease from the historic average of a 1,000 grayling (Tables 25 and 26). Recent sport catches are approximately 32,000 grayling, almost doubling of the 18,000 historic average. The Aniak River is the largest grayling fishery in the area, with the Kisaralik and Kanektok fisheries the next largest sport fisheries. Stock sizes of grayling in the LYLK 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 regulations and harvests appear to be within sustainable levels for Arctic grayling of the LYLK. High catch rates with low harvests indicate healthy fish stocks. Additionally, the low harvest rates are not an indicator of depressed fish stocks but 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 Southwest Alaska Rainbow Trout Management Plan and changing attitudes of anglers regarding the harvest of grayling (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 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 one year; the BOF addressed this plan during the January 2001 meeting.

Table 25.-Sport angler harvest and catch of Arctic grayling in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| Year | Kanektok River | | Goodnews River | | Arolik River | | Other Rivers | | Kuskokwim Bay Total | |
|-----------|----------------|-------|----------------|-------|--------------|-------|--------------|-------|---------------------|--------|
| | 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 |
| Average | 90 | 3,244 | 98 | 1,680 | 0 | 253 | 628 | 1,781 | 791 | 6,616 |
| 2000-2002 | | | | | | | | | | |
| Average | 40 | 3,736 | 95 | 2,233 | 0 | 223 | 6 | 352 | 141 | 6,212 |

Table 26.-Sport angler harvest and catch of Arctic grayling in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|--------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|--------|
| | 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 |
| Average | 336 | 6,567 | 157 | 3,634 | 91 | 1,184 | 630 | 1,850 | 956 | 11,102 |
| 2000-2002 | | | | | | | | | | |
| Average | 97 | 6,932 | 200 | 5,048 | 114 | 2,351 | 8 | 1,093 | 419 | 15,415 |

During the 2001 January BOF meeting, both the subsistence (5 AAC 2000p) and sport fishing bag and possession limits for resident fish (5 AAC 2000q) in the Aniak River were enacted with the establishment of an aggregate bag limit. A three (3) 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.

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.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one grayling a day, with 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 ten grayling a day, no size limit.

Current Kuskokwim Bay Arctic grayling regulations:

Kanektok and 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 2003 Season

Low water conditions in early June provided good fishing opportunities in most Kuskokwim area tributaries. These conditions eroded during late June with moderate levels of precipitation during July again degrading 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 grayling in the Aniak and Kisaralik rivers. Dependent on

fishing conditions, sport fishing reports on both the Kanektok and Goodnews rivers were rated as average-to-good through the summer months. Fall fishing was reported as excellent to above average because of the favorable fishing conditions and the large return of coho salmon.

Fishery Outlook

The grayling stocks of the Kuskokwim area are well protected with the current sport fishing regulations. A high catch rate with low harvests is a strong indicator of healthy fish populations. The outlook for grayling 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. In contrast, current rod and reel subsistence fisheries are not regulated and have no bag or possession limits. There is very limited monitoring of subsistence harvest and these rod and reel subsistence fisheries have the potential of over-exploiting local stocks. In order to provide sustainable yields resident fish populations require extensive periods of rebuilding once over-exploitation has been documented and regulatory protection enacted. With increasing restrictions in salmon fisheries in the Kuskokwim area, local people will likely rely on resident fish to help meet their subsistence needs. It is therefore critical that the department closely monitor subsistence harvests of resident fish stocks.

There are currently no major biological concerns for grayling fisheries in the LYLK. Area stocks should continue to provide good angling opportunities for the 2004 season.

Northern Pike Fishery Description

Overview

Most northern pike are harvested in lakes, streams and tributaries of within the LYLK. Very few pike (less than 50) are being recorded through SWHS in the Kuskowim 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 27). Local anglers seek pike when salmon are not available as a fresh source of fish, mostly during the winter months. Local subsistence fishermen will travel long distances by snow machine to fish for pike in the adjacent lower Yukon, within the Innoko River drainage. 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 LYLK 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 LYLK. 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 27).

Annual sport harvests of pike have decreased from the 1980s to the 1990s (Table 27). The reasons for these declines in harvests are unknown, but angler attitudes towards harvesting pike have may have changed in the 1990s or these harvest statistics may be truly representing only sport fishing harvest and not subsistence harvests of pike in the lower Kuskokwim area.

Table 27.-Sport angler harvest and catch of northern pike in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|-------|
| | 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 |
| Average | 94 | 644 | 14 | 48 | 62 | 219 | 1,174 | 1,434 | 1,269 | 2,238 |
| 2000-2002 | | | | | | | | | | |
| Average | 37 | 482 | 4 | 34 | 31 | 181 | 164 | 427 | 235 | 1,124 |

The current bag and possession limit for pike are slightly different between the Yukon and Kuskokwim rivers. The Yukon River pike daily bag and possession limit is 10, with no size limit. 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, except in the Aniak River.

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 one year; the BOF addressed this plan during the January 2001 meeting.

During the 2001 January BOF meeting, both the subsistence (5 AAC 2000o) and sport fishing bag and possession limits for resident fish (5 AAC 2000p) in the Aniak River were enacted with the establishment of an aggregate bag limit. A three (3) 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.

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.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one pike a day 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 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 2003 Season

There were no reported problems by anglers having difficulties locating northern pike during 2003 in the LYLK. The lack of bag and possession limits for the subsistence rod and reel fishery is of concern to managers of resident fish species. Although no abuses were reported there is concern on how healthy resident fish stocks can be maintained within sustainable bounds with unrestricted harvests and no real stock specific harvest monitoring system in place.

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 2004 season.

Sheefish Fishery Description

Overview

Most sheefish are harvested in streams and tributaries within the LYLK. The largest sheefish sport fishery occurs in the Holitna River above the Aniak River in the upper Kuskokwim Management area. However there are a few local anglers that have recently begun prospecting for sheefish in the lower tributaries of the Yukon and Kuskokwim. In the 1960s there was a directed commercial fishery for sheefish in the winter on the Yukon River. 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 LYLK are 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 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 LYLK. High catches with low harvests indicate healthy fish stocks (Table 28). Additionally, the low harvests are not an indicator of depressed fish stocks but an under utilized resource.

Annual sport harvests of sheefish have decreased from the 1980s to the 1990s (Table 28). The reasons for this decline in harvest is unknown, but angler attitudes towards harvesting sheefish may have changed in the 1990s or these harvest statistics may truly be representing only sport fishing harvest and not subsistence rod and reel harvests of sheefish in the lower Kuskokwim area.

The current bag and possession limit for sheefish is slightly different between the Yukon and Kuskokwim rivers.

Yukon River sheefish daily bag and possession limit is 10, with no size limit. Kuskokwim River sheefish 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 is 5, with no size limit, except in the Aniak River.

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

Table 28.-Sport angler harvest and catch of sheefish in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Rivers | | Lower Kuskokwim Total | |
|----------------------|-------------|-------|-----------------|-------|----------------|-------|--------------|-------|-----------------------|-------|
| | 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 |
| Average 2000-2002 | 26 | 215 | 3 | 39 | 8 | 99 | 254 | 303 | 272 | 555 |
| Average | 17 | 124 | 0 | 0 | 0 | 0 | 53 | 53 | 70 | 177 |

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 one year; the BOF addressed this plan during the January 2001 meeting.

During the 2001 January BOF meeting, both the subsistence (5 AAC 2000p) and sport fishing bag and possession limits for resident fish (5 AAC 2000q) in the Aniak River were enacted with the establishment of an aggregate bag limit. A three (3) 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.

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.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one sheefish a day 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.

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 2003 Season

There were no reported problems by anglers having difficulties locating sheefish during 2003 in the LYLK, except for poor fishing conditions attributed to the late spring and high rainfall during July. The lack of bag and possession limits for the subsistence rod and reel fishery is of concern to managers of resident fish species. Although no abuses were reported there is concern on how

healthy resident fish stocks can be maintained with sustainable bounds with unrestricted harvests and no real stock specific harvest monitoring system in place.

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 2004 season.

Lake Trout Fishery Description

Overview

Most lake trout are harvested in lakes of the headwater rivers and tributaries within the LYLK. 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 LYLK are unknown. Lake trout of the LYLK 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 LYLK. 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.

Annual sport harvests of lake trout have decreased from the 1980s to the 1990s (Tables 29 and 30). The reasons for this decline in harvest is unknown, but angler attitudes towards harvesting lake trout have changed in the 1990s or these harvest statistics may truly be representing only sport fishing harvest and not subsistence harvests of lake trout in the lower Kuskokwim area.

The current bag and possession limit for lake trout is 4 per day, except for restrictions in the Aniak River. 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 one year; the BOF addressed this plan during the January 2001 meeting.

Table 29.-Sport angler harvest and catch of lake trout in the Kanektok, Goodnews, Arolik, and other Kuskokwim Bay rivers, 1983-2002.

| | 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 |
| Average | 29 | 104 | 17 | 169 | 0 | 5 | 75 | 283 | 92 | 487 |
| 2000-2002 | | | | | | | | | | |
| Average | 3 | 43 | 6 | 135 | 0 | 11 | 6 | 40 | 15 | 229 |

Table 30.-Angler harvest and catch of lake trout in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Locations | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|-----------------|-------|-----------------------|-------|
| | 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 |
| Average | 28 | 136 | 35 | 104 | 6 | 30 | 119 | 336 | 147 | 524 |
| 2000-2002 | | | | | | | | | | |
| Average | 9 | 40 | 18 | 34 | 12 | 60 | 27 | 365 | 66 | 499 |

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 (5 AAC 2000o) and sport (5 AAC 2000p) anglers. A three (3) 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.

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.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one 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 four 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

- Bag and possession limit in the drainage is four lake trout, no size limit.

Current Kuskokwim Bay lake trout 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 four lake trout, no size limit.

Summary of the 2003 Season

There were no angler reports of problems of locating lake trout during 2003 in the LYLK. The lack of bag and possession limits for the subsistence rod and reel fishery is of concern to managers of resident fish species. Although no abuses were reported there is concern on how health resident fish stocks can be maintained with sustainable bounds with unrestricted harvests and no real stock specific harvest monitoring system in place.

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. In the past the BOF has taken action to reduce the harvest of Dolly Varden / Arctic char in lakes of the AYK region to two per day, with no size limit.. These slow to mature and slow growing lake trout and Dolly Varden / Arctic char stocks can be easily over harvested. The department has submitted a proposal (108) to the BOF

for consideration during the January 2004 meeting. 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. Without specific data, it would be cautionary to manage lake trout/Dolly Varden/Arctic char that inhabit AYK lakes under the same regulatory regime until further information becomes available.

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. In contrast, current rod and reel subsistence fisheries are not regulated and have no bag or possession limits. There is no stock specific harvest monitoring system in place for the subsistence harvest. Although relatively few subsistence users have airplane access to lake trout stocks in the area, the unproductive nature of these lake trout populations makes them particularly vulnerable. Of all the resident fish species with unrestricted harvests, lake trout are most susceptible to over-exploitation. The BOF and department need to be particularly attentive to subsistence and sport harvests of lake trout in LYLK.

Currently the Department has not identified a biological concern for lake trout fisheries in the LYLK. Area stocks should continue to provide good angling opportunities for the 2004 season.

Burbot Fishery Description

Overview

Most burbot are harvested in the rivers and tributaries within the LYLK. 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 LYLK 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 LYLK. The low harvests are not an indicator of depressed fish stocks but an under utilized resource (Table 31).

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 $\frac{3}{4}$ 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.

Table 31.—Sport angler harvest and catch of burbot in the Aniak, Kisaralik, Kwethluk and other lower Kuskokwim rivers, 1983-2002.

| Year | Aniak River | | Kisaralik River | | Kwethluk River | | Other Locations | | Lower Kuskokwim Total | |
|-----------|-------------|-------|-----------------|-------|----------------|-------|-----------------|-------|-----------------------|-------|
| | 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 |
| Average | 3 | 5 | 0 | 0 | 61 | 61 | 169 | 197 | 188 | 226 |
| 2000-2002 | | | | | | | | | | |
| Average | 0 | 2 | 0 | 0 | 0 | 0 | 218 | 218 | 218 | 219 |

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. Although burbot were not included in the temporary management plan of 2000 for the Aniak River, burbot were included in the January 2001 BOF discussions.

The only management action effecting burbot 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 2000o) and sport (5 AAC 2000p) anglers. A three (3) 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.

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.
- Aggregate bag and possession limit of three resident fish species, but only one of each single species, only one burbot 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 fifteen burbot a day, no size limit.

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

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

Summary of 2003 Season

There were no reported problems of anglers having difficulties locating burbot during 2003 in the LYLK. The lack of bag and possession limits for the subsistence rod and reel fishery is of concern to managers of resident fish species. Although no abuses were reported there is concern on how healthy resident fish stocks can be maintained with sustainable bounds within unrestricted harvests and no real stock specific harvest monitoring system in place.

Outlook

Currently the Department has not identified a biological concern for burbot stocks or fishery concerns in the LYLK. Area burbot stocks should continue to provide similar angling opportunities for the 2004 season.

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APPENDIX A
LOWER YUKON/LOWER KUSKOKWIM MANAGEMENT
AREA SPORT FISH EMERGENCY ORDERS
ISSUED IN 2002-2003

Appendix A.-Lower Yukon/Lower Kuskokwim Management Area sport fish emergency orders issued in 2002-2003.

| <u>EO Number</u> | <u>Effective Dates</u> | <u>Action</u> |
|-------------------------|-------------------------------|---|
| 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-03-02 | June 19 – Dec. 31, 2002 | Delayed the opening of king and chum sport fishery in the Yukon 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-CS-01-02 | Aug. 11 – Dec. 31, 2002 | Rescinded EO 3-KS-01-02 and closed the sport fishery for chum salmon in the Yukon River. |
| 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-CS-02-03 | Aug. 17 – Dec. 31, 2003 | Closed the sport fishery for chum salmon in the Yukon River drainage. |
| EO 3-CS-03-03 | Aug. 26 – Dec. 31, 2003 | Rescinded EO 3-CS-02-03 and reopened the sport fishery and restored the bag and possession limits for chum salmon in the Yukon River drainage. |

APPENDIX B
2002 FEDERAL SUBSISTENCE BOARD SPECIAL ACTION

Record of Public Notification
of Federal Subsistence Board public meeting on Fisheries Request for
Reconsideration ERF802-01, July 11, 2002

1. left message with Alaska Dream Lodge (Vince Mathews)
2. Aniak Air Guides: Vince gave them the news release.
3. Aniak River Lodge: Vince spoke with owner.
4. George Shavels: Vince e-mailed him the news release, and Jerry faxed him the RFR analysis and Staff Committee recommendation.
5. Henry Fryers River Guide: Vince tried to call him with no success.
6. Hook-M-Up: Vince called, no answer, no voice mail option.
7. Midnight Sun Trophy Pike Adventures: no longer has a valid phone number.
8. Lamont Elbertson: Left message with family.

(copy of the News Release is on the reverse side)



U.S. Fish and Wildlife Service
Bureau of Land Management
National Fish Service
Bureau of Indian Affairs

Federal Subsistence Board
News Release



For Immediate Release
June 26, 2002

Contact: Barbara Massey
Phone: (907) 786-3888 or (800) 478-1456
e-mail: barbara_massey@fws.gov

Federal Subsistence Board Restricts
Kuskokwim Non-Subsistence Uses of Salmon

Anchorage, Ak. — The Federal Subsistence Board restricted non-subsistence fishing for chinook and chum salmon on Federal waters of the Kuskokwim River drainage to the same four day per week subsistence fishing schedule (open Saturday through Wednesday). The Board was responding to a request from the Orutsarmut Native Council and Kuskokwim Native Association asking the Board to close sport fishing in Federal waters where subsistence fishing is closed. The decision affects primarily the Yukon Delta National Wildlife Refuge waters from the river mouth upstream to, and including the lower portion of the Aniak River. Federal jurisdiction on the Aniak River extends approximately 5.6 miles upstream of its confluence with the Buckstock River.

The Board heard testimony from Kuskokwim River subsistence fishermen that the subsistence fishing schedule hampers their ability to put up the fish they need for the winter when the weather is good for drying. They also observed that it was taking longer to get their fish, and that some elders were under undue hardship having to pull their boats each week during the closures while sport fishermen were allowed to fish seven days per week.

The subsistence fishing schedule is a major change in customary and traditional fishing practices for residents of the Kuskokwim River area. The Federal Board members noted that if there is an opportunity to liberalize the subsistence fishing schedule it run through means such action, then both user groups will be able to fish seven days per week in Federal waters. The Board met June 25 at the Egan Center in Anchorage with representatives set up in Bethel and Aniak. Additional information is available from the Office of Subsistence Management, (907) 786-3888 or (800) 478-1456.

For more information contact: Mike Rowden, (907) 543-3151, email
mike_rowden@fws.gov. Information on the Federal Subsistence Management
Program is available on <http://alaska.fws.gov/asm/home.html>.

-FSB-



U.S. Fish and Wildlife Service
Bureau of Land Management
National Park Service
Bureau of Indian Affairs

Federal Subsistence Board Meeting Advisory



Forest Service

For Immediate Release

July 2, 2002

Contact: Barbara Massey
(907) 786-3888 or (800) 478-1456
barbara_massey@fws.gov

Federal Subsistence Board Meets to Address Reconsideration Request for the Kuskokwim River

Anchorage, AK . . . The Federal Subsistence Management Board invites the public to join them for a public meeting to address the State of Alaska's Request for Reconsideration on a Special Action for fisheries management regarding the Kuskokwim River. The meeting will be held on:

**Thursday, July 11th at the Downtown Marriot,
7th and I Streets, 2nd floor, in the Fairbanks conference room
at 2 p.m.**

Proposed agenda items for this meeting include a request from the State of Alaska that the Federal Subsistence Board reconsider its June 25, 2002 decision on a Special Action Request, FSA02-03. The State of Alaska has requested this Request For Reconsideration, contending that the Federal Subsistence Board asserted authority beyond its legal jurisdiction. There will be a staff analysis, open floor public testimony, Regional Council Chair comments, Alaska Department of Fish and Game comments, Federal Subsistence Board deliberation, Federal Subsistence Board action, and an opportunity to discuss other business.

The Federal Subsistence Board restricted non-subsistence fishing for chinook and chum salmon on Federal waters of the Kuskokwim River drainage to the same four-day per week schedule (open Saturday through Wednesday) that subsistence users are limited to. The Board was responding to a request from the Orutsaramiut Native Council and Kuskokwim Native Association asking the Board to close sport fishing in Federal waters when subsistence fishing is closed. The decision affects primarily the Yukon Delta National Wildlife Refuge waters from the river mouth upstream to, and including the lower portion of the Aniak River. Federal jurisdiction on the Aniak River extends approximately 5.6 miles upstream of its confluence with the Buckstock River.

The Board heard testimony from Kuskokwim River subsistence fishermen that the subsistence fishing schedule is a major change in customary and traditional fishing practices and hampers their ability to put up the fish they need for the winter when the weather is good for drying. They also observed that it was taking longer to get their fish, and that some elders were subjected to undue hardship as a result of having to pull their nets out of the river each week during the closures, while sport fishermen were allowed to fish seven days per week.

-continued-

Appendix B1.-Page 3 of 3.

The Federal Board members noted that if run strengths prove sufficient to warrant the liberalization of the subsistence fishing schedule both user groups will be able to fish seven days per week in Federal waters.

- more -

Additional information is available from the Office of Subsistence Management, (907) 786-3888 or (800) 478-1456. Those interested in joining this meeting via teleconference, please contact Joy Wilfong at the Office of Subsistence Management.

For more information contact: Tom Kron, (907) 786-3604, email Tom_Kron@fws.gov. Information concerning the Federal Subsistence Management Program is available on <http://alaska.fws.gov/asm/home.html>. TTY users may call through the Federal Relay Service, (800) 877-8339.

- FSB -

Appendix B2.-Request for reconsideration by commissioner of June 28, 2002.

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

TONY KNOWLES, GOVERNOR

FRFRO2-01

P.O. BOX 25526
JUNEAU, AK 99802-5526
PHONE: (907) 465-4100
FAX: (907) 465-2332

Original to Adm. Record

June 28, 2002

Mitch Demientieff, Chair
Federal Subsistence Board
c/o Office of Subsistence Management
3601 C Street, Suite 1030
Anchorage, AK 99503

Dear Mr. Demientieff:

The Department of Fish and Game hereby files a Request for Reconsideration regarding the decision of the Federal Subsistence Board on June 25, 2002, to reduce sport fishing opportunity on the Kuskokwim River. We are very concerned that the Board has asserted authority in a matter that is quite clearly under state jurisdiction.

Our agency has demonstrated that we are currently providing for the subsistence priority, as required in state law, and that we are using a variety of suitable management tools to provide a reasonable opportunity for subsistence salmon fishing throughout this drainage. We consider that the Board has acted outside its legal authority.

Consequently, we request the Board take the necessary action to reconsider its decision of June 25, 2002, recognize the legal flaws, and rescind the decision. Whether or not the department acts to relax the subsistence fishing schedule in the Kuskokwim River drainage, we seek an expedited review of and response to this Request for Reconsideration. Thank you for considering this request.

~~Sincerely,~~


Frank Rue
Commissioner

Enclosure

-continued-

REQUEST FOR RECONSIDERATION OF
FEDERAL SUBSISTENCE REGULATION
(2002 Special Action Request FSA 02-03)
June 28, 2002

1. The requestor's name and mailing address:

Requestor's name: State of Alaska
Frank Rue, Commissioner
Alaska Department of Fish and Game

Mailing address: P.O. Box 25526
Juneau, AK 99802-5526

Telephone: (907) 465-4100

2. The action for which reconsideration is requested and the date of Federal Register publication of that action.

On June 25, 2002, The Federal Subsistence Board restricted non-subsistence fishing for chinook and chum salmon on Federal waters of the Kuskokwim River drainage to the four-day-per-week subsistence fishing schedule. The Board was responding to a request from the Orutsaramiut Native Council and Kuskokwim Native Association asking the Board to close fishing in Federal waters to all but federally qualified subsistence users. That request was denied. Subsequent to that vote, the Board took action to close sport fishing when subsistence fishing is closed. The regulation has not yet been published.

3. Statement of how the requestor is adversely affected by the action.

The general public of the State of Alaska, represented here by the Department of Fish and Game, is unnecessarily denied sport-fishing opportunity as a result of the June 25, 2002, decision by the Federal Subsistence Board. Moreover, the decision by the Board oversteps its jurisdiction and unnecessarily infringes upon the jurisdiction belonging to the Board of Fisheries. In implementing the subsistence priority under State law, the State has provisions in place to ensure reasonable opportunity for subsistence users in the Kuskokwim drainage to obtain fish and meet the amounts necessary for subsistence. The action by the Board thus is an unwarranted intrusion upon the State's authority to manage the sport fishery on Alaska's waters.

-continued-

4. Statement of the facts of the dispute, the issues raised by this request, and specific references to any law, regulation, or policy that the requestor believes have been violated and the reasons for such allegation.

A. Factual background:

Subsistence harvest information from 2001 shows that the schedule provided reasonable opportunity in terms of the determination of amount necessary for subsistence. This occurred even though the Kuskokwim River salmon runs were below average in 2001. Current data indicate that stronger runs are in progress during 2002 than were observed in 2001.

The federal staff analysis explained that the subsistence fishing schedule pertains to the use of nets. There are no limitations on subsistence fishing with rod and reel.

B. Consideration of Special Action Request FSA 02-03 by the Federal Subsistence Board

The Board initially voted on a motion to support the Federal Interagency Staff Committee majority recommendation to deny the request. This motion failed on a tie vote.

A second motion was proposed to consider the second part of the Special Action Request, to align sport fishing with the gill net subsistence fishing schedule. During the deliberations on the motion, there was clear consensus that the data on fish returns were favorable and that subsistence needs for salmon were being met.

Discussion of this proposal centered on the "optics" of an open sport fish season when subsistence fishing with nets is closed. Board members representing U.S. Forest Service and U.S. Fish and Wildlife Service each noted that these concerns did not satisfy the criteria in Section 815 of ANILCA regarding closures of non-subsistence uses, and thus they voted against the proposal. The motion passed with support from the other four board members.

C. The Federal Subsistence Board violated ANILCA and its implementing regulations by unnecessarily restricting non-subsistence uses.

The Board violated both ANILCA and its implementing regulations when it restricted sport fishing in federal waters. The Board not only applied the improper legal standard, but also failed to base its action on substantial evidence. By taking this unsupported action, the Board decision also violated the Administrative Procedure Act.

Specifically, the Board violated ANILCA Section 815, which provides that nothing in this title shall be construed as:

- (3) authorizing a restriction on the taking of fish and wildlife for nonsubsistence uses on the public lands ... **unless necessary for conservation of healthy populations of fish and wildlife, for the reasons set forth in Section 816, to continue subsistence uses of such populations, or pursuant to other applicable law;**
[Emphasis added.]

And the Board violated its implementing regulations at 36 C.F.R. 242.19(a), 50 C.F.R. 100.19(a), which provides in pertinent part:

The Board may make or direct restriction, closure, or opening for the taking of fish and wildlife for non-subsistence uses on public lands **when necessary to assure the continued viability of particular fish or wildlife population, to continue subsistence uses of a fish or wildlife population, or for reasons of public safety or administration.** [Emphasis added.]

The action by the Board was not supported by any evidence, substantial or otherwise, that the sport-fishing closure was "necessary." [Emphasis added.] All the information before the Board indicated that escapements and subsistence uses were expected to be met for chinook and chum salmon. The majority of the Federal Interagency Staff Committee, whose recommendation was supported by the State of Alaska, noted that all available data reported good catches with escapements and subsistence needs being met at this point in the run.

Conversely, the Board's actions applied an improper standard and restricted the sport fishery based on the perception of subsistence users. The decision to restrict sport fishers was not based on a conservation concern nor on a lack of subsistence opportunity, but was based on subsistence users' perceptions of sport fishing use. Although public perception provides an important cornerstone of sustainable resource management, it is not a criterion under ANILCA to legitimize the action taken by the Board to reduce sport fishing opportunity.

By basing its decision on the inappropriate standard, the Board restriction was contrary to law. Moreover, since all the evidence supported the conclusion that the restriction was unnecessary, the Board's action is not based on substantial evidence. By taking this unsupported action, the Federal Subsistence Board acted arbitrarily and capriciously, and in violation of ANILCA and its implementing regulations.

D. The Federal Subsistence Board did not follow its own regulations and acted arbitrarily and capriciously when it restricted sport fishing.

Without a sustainability problem or genuine conservation concern, no basis exists for considering the closure of a fishery to non-federally qualified users. See ANILCA section 815, 36 C.F.R. 242.19(a), 50 C.F.R. 100.19(a). The Board's action here in restricting sport fishing where there was no substantial evidence to support a finding

of a genuine conservation or viability problem was arbitrary and capricious and in violation of the Administrative Procedure Act.

E. The Federal Subsistence Board did not have authority to take action restricting non-subsistence us.

Without authority, the action taken by the Board undermined the jurisdiction of the Alaska Board of Fisheries. Such changes could be enacted under the authority of the Board of Fisheries by issuing an emergency regulation as specified in AS 44.62.250 and 5AAC 96.625(f).

5. Statement of how the requestor would like the action changed.

The State hereby petitions the Federal Subsistence Board to rescind the regulatory action taken on June 25, 2002.

The State requests a response to this request for reconsideration, regardless of whether the commercial fishing season is opened.

6. Request for expedited review:

Due to the abrupt change to the sport fishing schedule anticipated to take effect starting June 30, 2002, the State requests an expedited review and decision on this request.

Appendix B3.-Interagency staff committee recommendation.

INTERAGENCY STAFF COMMITTEE RECOMMENDATION

Fisheries Request for Reconsideration, FRFR02-01

The Staff Committee reached consensus upon a recommendation that the Federal Subsistence Board rescind its June 25, 2002, decision to restrict non-subsistence uses on the same days as the closed subsistence fishing schedule in the Kuskokwim River drainage.

Justification

Claims one and two are valid and have merit, whereas claim 3 is not valid as the Federal Subsistence Board clearly has the authority to restrict non-subsistence uses when one or more of the criteria outlined in ANILCA Section 815(3) are met.

There is no substantial evidence to support the Board action to restrict non-subsistence uses under the Federal Subsistence Board's authority outlined in 36 CFR 242.19(a) and 50 CFR 100.19(a). The restriction was not necessary to support the continued viability of Kuskokwim chinook and chum salmon stocks. The staff analysis clearly noted that inseason run strength indicators were sufficient to expect subsistence and escapement needs to be met and that no conservation concerns existed. The restriction was also not necessary to continue subsistence uses of any chinook or chum salmon stock. The subsistence schedule was imposed to assure that escapement goals were met and that upstream subsistence users' needs were met. The schedule, as part of the rebuilding plan, is the key to continuing subsistence uses of the Kuskokwim stocks of concerns. Additionally, subsistence users have been subject to restrictions on their taking of fish by commercial fishing activities long before the subsistence schedule went into effect in 2000. While recognizing the 4-day per week subsistence schedule is a departure from historic traditional practices, restricting sport or other non-subsistence uses does not contribute to continuing subsistence uses of Kuskokwim River salmon.

Appendix B4.-Federal staff analysis of July 9, 2002.

Jerry Berg 786-3876
Federal Subsistence Board

July 9, 2002

DRAFT STAFF ANALYSIS FRFR02-01

ISSUE

The Fisheries Request for Reconsideration 02-01, submitted by the Alaska Department of Fish Game, requests the Federal Subsistence Board reconsider the action to restrict non-subsistence fishing for chinook and chum salmon on Federal waters within the Kuskokwim River drainage, to the same schedule as the subsistence net and fish wheel fishing schedule. The Federal Subsistence Board's action was in support of part of the fisheries special action request, FSA02-03, submitted by the Orutsaramuit Native Council (ONC) and Kuskokwim Native Association (KNA). The ADF&G asserted that the Federal Subsistence Board unnecessarily restricted a non-subsistence use without proper cause in violation of Section 815(3) of ANILCA and 50 CFR 100.19(a), that the Federal Subsistence Board did not provide sufficient justification for their decision, and that the Board did not have the authority to do so.

DISCUSSION

Special action FSA02-03 requested limiting chinook and chum salmon harvests in Federal waters of the Kuskokwim River drainage to Federally qualified subsistence users or alternatively, to limit non-subsistence fishing activities to the same schedule being imposed on subsistence harvest activities.

The Federal Subsistence Board accepts a request for reconsideration only if it is based on information not previously considered by the Board, demonstrates that the existing information used by the Board is incorrect, or demonstrates the Board's interpretation of information, applicable law, or regulation is in error or contrary to existing law. This RFR was accepted for consideration based on the latter of the three criteria.

History

Special action request FSA02-03 was submitted on April 26, 2002 and was reviewed by the Federal Subsistence Board on May 1, 2002. The Federal Subsistence Board deferred action at that time because ADF&G had reduced the daily sport fish bag limit from three to one chinook or chum salmon, and delayed the sport fishery opening until June 15. In addition, the Federal Subsistence Board recognized that a more informed decision could be made based on inseason salmon run strength data in late June. The Federal Subsistence Board met on June 25, 2002 and took action to adopt part of the special action request to align subsistence and non-subsistence fishing schedules, which resulted in the following regulation.

§ 27(i)(4)(i)(A) Kuskokwim Area – Unless you are a Federally qualified subsistence user, you may not take chinook or chum salmon from the Kuskokwim River or its tributaries on the same closed days as the subsistence fishing schedule, unless superceded by a Federal special action. Chinook and chum salmon taken incidentally must be released immediately.

Jerry Berg 786-3876
Federal Subsistence Board

July 9, 2002

When they made their decision on June 25th, the Federal Subsistence Board was informed that there would be an assessment made on June 27th to determine the run strength and consider the possibility of relaxing the subsistence fishing schedule.

On June 27th, the ADF&G reported to the Kuskokwim River Salmon Management Working Group, that the 2002 inseason indicators of chinook and chum salmon run strength indicated sufficient abundance of salmon to allow for a commercial chum fishery. The ADF&G recommended that the commercial fishing season be opened, but no commercial fishing period be considered unless a buyer/processor was available, and that the subsistence salmon fishing be allowed seven days per week. The Federal inseason manager concurred with this assessment. The Working Group voted to not support the recommendation provided by the ADF&G. They subsequently voted in support of two more motions: 1) that the ADF&G conduct an environmental impact study to assess the effect that boat traffic is having on the salmon spawning grounds and 2) that ADF&G close sport fishing in all State waters of the Kuskokwim River drainage on the same days that subsistence fishing is closed.

The Working Group is a public forum composed of individuals representing commercial, subsistence and sport fishermen, Federal Regional Advisory Councils and processor fishing interests. The Working Group is charged with making recommendations on in-season salmon management actions to the ADF&G. The ADF&G area manager and the Federal inseason manager have final action authority.

On June 28th, State and Federal managers agreed that the inseason run strength indicators were sufficient to allow for a commercial chum salmon fishery in the Kuskokwim River. These indicators supported the joint decision to allow subsistence fishing seven days per week. This action also lifted the restriction on non-subsistence users imposed by the Federal Subsistence Board on June 25th.

The Federal and State managers' action followed the guidelines of the *Kuskokwim River Salmon Rebuilding Plan* established by the State of Alaska Board of Fisheries and agreed to in the Federal/State Memorandum of Agreement. The rebuilding plan established a restricted subsistence fishing schedule in a conservation effort to address declining salmon runs. The BOF determined that a fishing schedule, which allowed subsistence fishing four days per week, would help to rebuild the salmon runs by providing closed periods during which salmon pass through without fishing pressure, to improve the quality of escapement with possibly more large females reaching spawning grounds, and to more evenly spread the subsistence fishing opportunity throughout the drainage. The rebuilding plan addresses sport fishing management by identifying seasons and bag limits for the Aniak River and that ADF&G will restrict the sport "fishery by emergency order for conservation purposes, the restrictions will be based on the level of abundance" (5AAC 07.365).

Given the current status of the inseason run strength indicators and inseason subsistence fishing reports, it is expected that escapements and subsistence needs will be met for chinook and chum salmon in 2002.

Jerry Berg 786-3876
Federal Subsistence Board

July 9, 2002

Claim by the requestor

The Office of Subsistence Management received a letter of request for reconsideration on June 28, 2002 from the ADF&G regarding Board action on FSA 02-03. There were three primary claims identified by the State of Alaska.

Claim 1: The Federal Subsistence Board violated ANILCA (Section 815) and its implementing regulations by unnecessarily restricting non-subsistence uses.

“The Board not only applied the improper legal standard, but also failed to base its action on substantial evidence.”

“The action by the Board was not supported by any evidence, substantial or otherwise, that the sport-fishing closure was ‘necessary’.”

“By basing its decision on the inappropriate standard, the Board restriction was contrary to law.”

Claim 2: The Federal Subsistence Board did not follow its own regulations and acted arbitrarily and capriciously when it restricted sport fishing.

“Without a sustainability problem or genuine conservation concern, no basis exists for considering the closure of a fishery to non-Federally qualified users. The Board’s action here in restricting sport fishing where there was no substantial evidence to support a finding of a genuine conservation or viability problem was arbitrary and capricious and in violation of the Administrative Procedure Act.”

Claim 3: The Federal Subsistence Board did not have authority to take action restricting non-subsistence use.

“Without authority, the action taken by the Board undermined the jurisdiction of the Alaska Board of Fisheries.”

Analysis of Claim 1

The State’s RFR claims that the Board violated Section 815(3) of ANILCA and its implementing regulations [36 C.F.R. 242.19(a) and 50 C.F.R. 100.19(a)] by unnecessarily restricting non-subsistence uses. Section 815 of ANILCA provides that:

Nothing in this title shall be construed as ... (3) authorizing a restriction on the taking of fish and wildlife for non-subsistence uses on the public lands (other than national parks and park monuments) unless necessary for the conservation of healthy populations of fish and wildlife, for the reasons set forth in section 816, to continue subsistence uses of such populations, or pursuant to other applicable law; or [Emphasis added.]

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Federal Subsistence Board

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Federal subsistence regulations in 36 CFR § 242.19(a) and 50 C.F.R. 100.19(a) define the Federal Subsistence Board's authority as follows:

36 CFR § 242.19(a), 50 C.F.R. 100.19(a) Special actions.

(a) The Board may restrict, close, or reopen the taking of fish and wildlife for non-subsistence uses on public lands when necessary to assure the continued viability of a particular fish or wildlife population, to continue subsistence uses of a fish or wildlife population, or for reasons of public safety or administration [Emphasis added.]

The staff analysis prepared for FSA02-03 clearly noted that the inseason indicators are sufficient to expect subsistence and escapement needs to be met and that no conservation concern exists for 2002 based on current run strength indicators. In addition, sport fishermen do not harvest many salmon overall and, at present levels, they will likely have little impact on escapements or subsistence harvest levels during an average or better than average run, even if allowed to continue seven days per week. The State contends that this information, when considered in light of the language in Section 815 of ANILCA that nothing in Title VIII shall be construed as authorizing a restriction on non-subsistence uses unless one of the criteria are met, precludes the Federal Subsistence Board from restricting non-subsistence uses.

At the Federal Subsistence Board meeting on June 25, 2002, extensive public testimony was provided by Kuskokwim River subsistence fishermen. They indicated that the subsistence fishing schedule hampers their ability to put up the fish they need when the weather is good for drying, that it takes longer to get their fish, and that some elders were under undue hardship having to pull their nets each week during the closures. Subsistence users also testified regarding the inequity of remaining "on the beach" while sports fishermen were allowed to fish during the closed days of the subsistence fishing schedule.

This public testimony primarily addresses Section 802 of ANILCA, which states that "...the utilization of the public lands in Alaska is to cause the least adverse impact possible on rural residents who depend upon subsistence uses." The subsistence fishing schedule is a major change in customary and traditional fishing practices for residents of the Kuskokwim River area.

Federal Subsistence Board members supporting the special action referenced public testimony of changes to the customary and traditional practices in the area and that the subsistence fishing schedule prevented subsistence fishermen from fishing during the closed days while sports fishermen were allowed to fish on those same days. The Federal Subsistence Board members in opposition to the special action pointed out that there was no conservation concern, that subsistence needs were being met and they therefore could not support a restriction on non-subsistence users. Federal Subsistence Board members did note that if run strength warrants relaxing the subsistence fishing schedule, then both user groups would be able to fish seven days per week in Federal waters. In fact, the schedule was relaxed a few days after the Board action.

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Federal Subsistence Board

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Analysis of Claim 2

The State claims that the Federal Subsistence Board restricted sport fishing without substantial evidence to support a finding of a genuine conservation or viability problem and this was arbitrary and capricious and in violation of the Administrative Procedure Act.

Under the Administrative Procedure Act, agency exercises of judgment or discretion are reviewed under the "arbitrary, capricious, or abuse of discretion" standard (486 U.S. 29, 42-43, 1983). Under this standard, the Federal Subsistence Board's determination will be upheld by a court if it is rational, based on consideration of the relevant factors, and within the scope of the Board's authority. The Federal Subsistence Board must examine the relevant data and articulate a satisfactory explanation for its action, including a rational connection between the facts found and the choices made. If these conditions are met, a court will not substitute its judgment for that of the Federal Subsistence Board.

Federal subsistence regulations implementing the Federal Subsistence Board's authority are the same as those outlined under Claim 1. The Administrative Procedure Act requires the Federal Subsistence Board to follow its own regulations also outlined under Claim 1.

Federal Subsistence Board members in support of the special action referenced public testimony in support of their action while those in opposition referenced the fact that there was not a conservation concern this year, that subsistence needs were being met and they therefore could not support a restriction on non-subsistence users.

Analysis of Claim 3

The State claims that the Federal Subsistence Board did not have authority to take action restricting non-subsistence use and that the Board undermined the jurisdiction of the Alaska Board of Fisheries.

In the context of the Federal Subsistence Board's authority to restrict non-subsistence uses, Federal regulations are clearly defined in 36 C.F.R. 242.19(a) and 50 C.F.R. 100.19(a). The Federal Subsistence Board may restrict non-subsistence uses only "*when necessary to assure the continued viability of a particular fish or wildlife population, to continue subsistence uses of a fish or wildlife population, or for reasons of public safety or administration.*"

APPENDIX C

Appendix C.–Reference information specific to 2004 Board of Fisheries proposals.

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| 104 | Aniak River Sport Fishery management | | 9, 14, 17, 18, 19, 20, 22, 24, 26, 27 | 31, 41, 47, 51, 53, 54, 59, 67, 72, 75 | 5 | 63 |
| 145 | Align sport fish openings with subsistence net and wheel fishery | | 5, 18 | 25, 51 | | |