**Fishery Management Report No. 07-66**

# 2007 Recreational Fisheries Overview and Historic Information for North Kenai Peninsula: Fisheries under Consideration by the Alaska Board of Fisheries, February 2008

**by**

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**and**

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**December 2007**

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

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**Weights and measures (metric)**

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

**Weights and measures (English)**

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

**Time and temperature**

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

**Physics and chemistry**

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

**General**

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

**Measures (fisheries)**

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

**Mathematics, statistics**

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

*FISHERY MANAGEMENT REPORT NO. 07-66*

# 2007 RECREATIONAL FISHERIES OVERVIEW AND HISTORIC INFORMATION FOR NORTH KENAI PENINSULA: FISHERIES UNDER CONSIDERATION BY THE ALASKA BOARD OF FISHERIES, FEBRUARY 2008

by

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December 2007

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*This document should be cited as:*
*Begich, R.. N., and J. A. Pawluk. 2007. 2007 Recreational fisheries overview and historic information for North Kenai Peninsula: fisheries under consideration by the Alaska Board of Fisheries, February 2008. Alaska Department of Fish and Game, Fishery Management Report No. 07-66, Anchorage.*

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# ABSTRACT

This report provides information on fisheries in the North Kenai Peninsula Management Area under consideration by the Alaska Board of Fisheries in February 2008. An overview of the sport and personal use fisheries with a summary for estimates of effort, catch, and harvest through 2006 is provided. We have also included 2007 recreational fishery summary information, when available, that provides updated fishery statistics with inseason assessment data from 2007. The following recreational fisheries are included: Kenai River Chinook salmon early and late runs, Kasilof River Chinook salmon early and late runs, Russian River sockeye salmon early and late runs, Kenai River sockeye salmon late run, Kenai River coho salmon, Kenai River resident species (rainbow trout and Dolly Varden), Hidden Lake lake trout, and areawide northern pike. The Kenai and Kasilof Rivers sockeye salmon personal use fisheries are also discussed.



Key words: North Kenai Peninsula Management Area, 2007 season overview, Kenai River, Kasilof River, Russian River, Chinook salmon, sockeye salmon, coho salmon, rainbow trout, Dolly Varden, northern pike, personal use, dip net, Alaska Board of Fisheries.


# MANAGEMENT OVERVIEW

This report provides information on fisheries under consideration by the Alaska Board of Fisheries (BOF) in February 2008:

(1) Kenai River Chinook salmon early-run recreational fisheries

(2) Kenai River Chinook salmon late-run recreational fisheries

(3) Kasilof River Chinook salmon early-run recreational fisheries

(4) Kasilof River Chinook salmon late-run recreational fisheries

(5) Russian River sockeye salmon early-run recreational fisheries

(6) Russian River sockeye salmon late-run recreational fisheries

(7) Kenai River sockeye salmon late run recreational fisheries

(8) Kenai River coho salmon recreational fisheries

(9) NKPMA resident species recreational fisheries

(10) Hidden Lake lake trout fishery

(11) NKPMA sockeye salmon personal use dip net fishery

(12) NKPMA northern pike fishery

An overview of the area, sport and personal use fisheries, as well as a season summary of the 2007 North Kenai Peninsula Management Area recreational fisheries are incorporated into this document.

## MANAGEMENT AREA DESCRIPTION

The Northern Kenai Peninsula Management Area (NKPMA) includes all Kenai Peninsula freshwater drainages from the north bank of Ingram Creek south to the south bank of Kasilof River (Figure 1). On the west side of Cook Inlet, the management area comprises freshwater drainages from West Forelands south to Spring Point, which is just north of Chinitna Bay. Marine waters of NKPMA are all waters from the latitude of East Forelands south to the latitude of Kasilof River; all marine waters in close proximity (several miles) to the west side of Cook Inlet from West Forelands south to Spring Point. This area is administered from the Soldotna office of the Alaska Department of Fish and Game (ADF&G).

Larger communities located within the KPMA include Kenai and Soldotna. Smaller communities are Cooper Landing, Hope, Moose Pass, Nikiski, and Sterling. This management area is linked to the state's highway system via the Sterling and Seward highways, which provide sport anglers access to many of the area's major fisheries. Remote areas of the KPMA (west side of Cook Inlet) can be accessed via wheel or float equipped aircraft, or boat.

## MANAGEMENT PLANS AFFECTING FISHERIES

Upper Cook Inlet fisheries (commercial, sport, personal use, and subsistence) have been the focus of intensive, allocative debates for many years. These controversial issues have prompted the Alaska Board of Fisheries to establish management plans and regulatory policies that allocate the area's fisheries resources among various user groups. These plans provide for the sustained yield of fishery resources and establish management actions (in specific situations), and guidelines for department fisheries managers.

Management plans germane to NKPMA fisheries are:

1. *Upper Cook Inlet Salmon Management Plan* (5 AAC 21.363)
2. *Kenai River and Kasilof River Early-run King Salmon Management Plan* (5 AAC 57.160)
3. *Kenai River Late-run King Salmon Management Plan* (5 AAC 21.359)
4. *Kenai River Late-run Sockeye Salmon Management Plan* (5 AAC 21.360)
5. *Russian River Sockeye Salmon Management Plan* (5 AAC 57.150)
6. *Kasilof River Salmon Management Plan* (5 AAC 21.365)
7. *Big River Sockeye Salmon Management Plan* (5 AAC 21.368)
8. *Upper Cook Inlet Personal Use Salmon Fishery Management Plan* (5 AAC 77.540)
9. *Riparian Habitat Fishery Management Plan for the Kenai Peninsula Area* (5 AAC 56.180)
10. *Riparian Habitat Fishery Management Plan for the Kenai River Drainage Area* (5 AAC 57.180)
11. *Kenai River Coho Salmon Management Plan* (5 AAC 57.170)

Management and research functions for the NKPMA recreational and personal use fisheries are the responsibility of the Soldotna area office of the Alaska Department of Fish and Game, Division of Sport Fish (SFD). The Division of Sport Fish management staff stationed at Soldotna is composed of one Area Management Biologist and one Assistant Area Management Biologist who manage all freshwater finfish. One Fishery Biologist and two seasonal Fish & Wildlife Technicians whose employment ranges from 3 to 6 months assist these staff. A Program Technician and one seasonal Clerk also support the Soldotna management staff.

## FISHERIES RESOURCES

The NKPMA offers diverse fishing opportunities for recreational and personal use anglers. Anglers can target four species of Pacific salmon (Chinook *O. tshawytscha,* sockeye *O. nerka,* coho *O. kisutch*, and pink *Oncorhynchus gorbuscha*). Fisheries for these species occur primarily in freshwater and, to a lesser degree, in the salt waters of Cook Inlet. Anglers can also target salmon and trout stocked by the SFD into various landlocked lakes. Popular fisheries for

resident stocks of rainbow trout *O. mykiss,* Dolly Varden *Salvelinus malma,* and lake trout *Salvelinus namaycush* also occur. Fisheries target resident stocks of Arctic grayling *Thymallus arcticus* and introduced stocks of northern pike *Esox lucius* as well. The area's anadromous stocks of Dolly Varden *Salvelinus malma*, steelhead trout *O. mykiss*, and eulachon *Thaleichthys pacificus* also provide NKPMA sport fishing opportunities.

Marine sport fisheries offer limited opportunities. Adjacent to the mouths of the Kenai and Kasilof Rivers and the waters of Cook Inlet within the management area, small numbers of anglers target halibut *Hippoglossus stenolepis*, razor clams *Siliqua patula,* and several species of hardshell clams.

Two runs of wild Kenai River Chinook salmon combine to support the largest recreational fishery for this species in Alaska. Stocked and naturally produced Chinook salmon returns to Crooked Creek support an early-run fishery in Kasilof River. A late run comprised of wild Chinook salmon also provides sport fishing opportunity at the Kasilof River.

The Russian River supports an early and late sockeye salmon return. These wild stocks maintain the second largest recreational sockeye salmon fishery in the state. As a result of changes to the management of Kenai River sockeye salmon and increased escapement goals, the Kenai River recreational sport fishery for sockeye salmon has grown into the largest recreational fishery for this species in Alaska.

The NKPMA also supports personal use sockeye salmon dip net fisheries at the mouths of the Kenai and Kasilof rivers and a personal use gillnet fishery at the mouth of the Kasilof River. The personal use fisheries on both the Kenai and Kasilof rivers are managed with established seasons and provide significant sockeye salmon harvest opportunities for statewide participants.

Wild coho salmon returns to Kenai River support the largest recreational freshwater coho salmon fishery in Alaska. The Kasilof River and numerous smaller streams also support smaller coho salmon sport fisheries. Additional fishing opportunity for coho salmon is provided through a program of stocking landlocked lakes on the Kenai Peninsula.

Pink salmon return in large numbers to NKPMA drainages during even-numbered years. A significant recreational fishery for this species occurs on the Kenai River. Harvests in the Kenai River have increased during even years because of liberalized bag and possession limits (6 pink salmon daily). Chum salmon *O. keta* returns to NKPMA streams on the east side of Cook Inlet are quite small and do not support a significant sport fishery.

Rainbow trout occur in numerous lakes and streams throughout the NKPMA. Flowing waters that support major rainbow trout fisheries include the Kenai River, Russian River, and the streams and lakes of the Swanson and Moose river drainages. To provide alternative fishing opportunities, several landlocked lakes are also stocked with rainbow trout.

Steelhead trout currently provide recreational fishing opportunity in Kasilof River. Steelhead production is thought to originate from two primary sources. A stocked return of this species was developed in the 1980s using wild stocks indigenous to Crooked Creek. The stocking program was discontinued in 1995 due to excessive straying of hatchery trout into the Kenai River system. Since 1995, steelhead trout production in Crooked Creek has resulted from natural production. Tributaries of Tustumena Lake (Nikolai and Shantalilik creeks) also maintain wild production.

Dolly Varden are found in most freshwater drainages of the NKPMA. This species supports a major fishery in the Kenai River drainage. Numerous smaller streams and lakes also support

Dolly Varden, thus providing additional recreational angling opportunity at roadside as well as more remote locations.

Lake trout are found primarily in four lakes within the NKPMA. Hidden, Kenai, Skilak, and Tustumena lakes support a modest fishery for lake trout, with Hidden Lake receiving most of the fishing effort.

## RECENT RECREATIONAL ANGLER EFFORT

This section provides generalized participation trends in the NKPMA. Angler effort and harvest data for the sport fisheries in the NPKMA are available through 2006 (Tables 1-5). Statewide Harvest Survey (SWHS) data for the 2007 season will be available in mid-2008.

Since 1977, recreational angler effort has been estimated using the SWHS, a mail survey (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b).

Additionally, creel surveys have been selectively implemented for fisheries that require inseason or hatchery stock composition information for management purposes. The following historical summaries of recreational angler effort in the NKPMA are based on estimates produced from the SWHS mail surveys (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b).

From 2004 through 2006, the NKPMA accounted for 21 to 24% of the total statewide recreational effort (Table 1). In 2006, participation approximated 553,884 angler-days in NKPMA waters. Angler participation between 2003 and 2004 increased significantly from 460,599 to 527,776 angler-days and from 2004 to 2006 it has steadily increased from 527,776 to 553,884 angler-days (Table 1; Figure 2).

The Kenai River accounts for the largest recreational fishery in the NKPMA. From 2004 to 2006, this river accounted for 59 to 72% of the area's total recreational angling effort, or 329,122 to 388,677 angler-days annually (Table 1). Historically, most of this effort occurs downstream from the Soldotna Bridge (i.e., Sterling Highway Bridge) to Cook Inlet with salmon, Dolly Varden, and rainbow trout being some of the most abundant species harvested (Tables 2-3).

Other fresh waters of the Kenai Peninsula support major recreational fisheries (Tables 4-5) as well. Of these, Russian River supports the largest fishery, with the most participation directed towards early- and late-run sockeye salmon. The Kasilof River supports a major fishery directed at early-run Chinook salmon. Also of significance is the Swanson River sport fishery which is primarily directed at coho salmon and rainbow trout.

Personal use salmon dip net fisheries at the mouths of the Kenai and Kasilof rivers have become extremely popular with the public. From 2004 to 2006, an average of 17,392 and 4,898 angler-days of effort were expended in the Kenai and Kasilof rivers personal use fisheries, respectively (Table 6). The mean harvest for all species of salmon by the NKPMA personal use dip net fisheries from 2004 to 2006 was 288,271 fish with sockeye salmon being the predominate species harvested (Table 7). Effort and harvest in the 2006 Kenai River personal use dip net fishery was atypical due to a later than expected late return of sockeye salmon to Kenai River. This resulted in closure and subsequent late season liberalization of the dip net fishery.

# 2007 KENAI RIVER CHINOOK SALMON RECREATIONAL FISHERIES

## 2008 PROPOSALS TO THE ALASKA BOARD OF FISHERIES CONCERNING KENAI RIVER CHINOOK SALMON SPORT FISHERY ISSUES

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b).will likely have some impact on the sport fisheries targeting Chinook salmon in the Kenai River:

> Proposal Numbers: 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 297, 298, 299, 300, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 321, 322, 323, 324, 325, 326, 328, and 329.

## BACKGROUND AND HISTORICAL PERSPECTIVE

Information about harvest, catch, and fishing effort is available from the SWHS and creel surveys conducted in the lower portion of Kenai River (Hammarstrom 1974-1981; Hammarstrom and Larson 1986-1984, 1986; Hammarstrom et al. 1985; Hammarstrom 1988-1994; King 1995-1997; Marsh 1999, 2000; Reimer et al. 2002; Reimer 2003, 2004a-b, In prep; Eskelin *In prep* a-c). The 2007 SWHS survey results will not be available until the fall of 2008. Chinook salmon catch and harvest data provided for the 2007 season contained in this document were estimated inseason and are *considered preliminary* until the SWHS results are available.

Chinook salmon return to Kenai River in two distinct runs, early and late. The first run usually has "fishable" numbers by mid-May and it peaks in mid-June. The majority of the stocks have passed through the fishery by late June. Late-run fish are present in July and early August. Early-run Chinook salmon primarily spawn in tributaries with most of the fish in two primary tributaries, the Killey and Funny Rivers. Late-run fish are primarily mainstem Kenai River spawners.

The recreational fishery for Chinook salmon in the Kenai River is internationally recognized due to its proximity to major population centers, relative ease to access, and large sized Chinook salmon. Consequently, large numbers of anglers participate in this recreational fishery every year. Because of the high level of participation in relation to the total number of Chinook salmon in the return, the fishery is strictly regulated. Chinook salmon fishing is limited to a 50-mile area downstream from Skilak Lake (Figure 3). The season is January 1 through July 31. By regulation, the early-run Kenai River Chinook salmon fishery ends on June 30. The daily bag and possession limit is one Chinook salmon, 20 inches or greater in length. The annual (January 1-December 31) limit is two fish. The majority of the harvest is taken by anglers in boats. After retaining a Chinook salmon, an angler is prohibited from fishing from a boat in the Kenai River downstream from Skilak Lake for the remainder of that day.

The Kenai River Chinook salmon fishery supports a commercial guiding industry. Since 1982, guides have been required to register with the State of Alaska. Guided anglers are more intensively regulated than nonguided anglers. This is due, in part, to the guided fishermen's

greater harvest efficiency and the general concern regarding harvest parity between guided and nonguided anglers.

Most of the river area available to Chinook salmon fishing is managed as a state park by the Department of Natural Resources, Division of Parks and Outdoor Recreation (DPOR). In 1986, DPOR reduced the maximum size of outboard motors that could be legally used on the river to 50 horsepower. In 1987, the maximum, legal horsepower was further reduced to 35 horsepower. The public has generally favored the restriction to smaller outboards. There is no evidence to indicate that the use of smaller motors has reduced angler efficiency. A proposed DPOR regulation is currently scheduled to become effective in 2008 that will raise the maximum size of outboard motors that can be legally used on the river to 50 horsepower.

Under current Alaska Board of Fisheries policy, the early-run is managed for the inriver sport and guided sport fishery. Although known to be relatively minor, early-run fish are intercepted in the mixed-stock Cook Inlet marine sport fishery prior to their entry into the Kenai River. In addition, there are small numbers of early-run Chinook salmon harvested in the Kenaitze Indian Tribal Association's educational fishery (Table 8). Commercial harvests of early-run Chinook salmon are considered insignificant. By regulation, drift gillnetting in the Central District does not commence until the third Monday in June or June 19, whichever is later, and the eastside setnet fishery does not commence until June 25 or, if 50,000 sockeye have been estimated to have passed the Kasilof sonar, by June 20 in the Kasilof section.

In 1984, ADF&G implemented an experimental sonar program to determine the number of Chinook salmon that return to Kenai River. From 1984 to 1994, the sonar counter used dual-beam transducer technology. Beginning in 1995 to the present, the sonar program adopted split-beam technology to improve the estimation of Chinook salmon returning to the Kenai River. Estimation uncertainty, due to the problem of differentiating between the various salmon species migrating together into the Kenai River has necessitated that the sonar program employ several different methods to better separate Chinook salmon from the more numerous sockeye salmon in the final estimates (Bosch and Burwen 2000). Since inception, the sonar program has been in a continuous evolution. Annual experiments to assess the utility of new sonar technology such as Dual Frequency Identification Sonar (DIDSON) as well as revaluation of split-beam technology have been undertaken.

A Kenai River Chinook salmon genetic stock identification research program was initiated in 2005. This study establishes baseline genetic structure for Kenai River Chinook salmon. Populations of various tributary and mainstem spawning fish appear to be sufficiently unique to enable genetic stock identification. The next phase of this research will collect and analyze mixed-stock samples and try to identify stock-specific run timing and stock composition of harvests. This information will improve escapement calculations for early- and late-run stocks. In addition, information on return timing for specific stocks or sub-stocks would help managers refine present and future regulations. Combined with information from the Pacific coast-wide Chinook salmon genetic database, this information may enable estimating harvest of Kenai River fish in mixed-stock marine fisheries.

Chinook salmon sport fish harvest declined steadily from 1993 through 1998 but has rebounded somewhat since (Table 3). The most recent 10-year (1997-2006) average Kenai River Chinook salmon sport fish harvest was 15,972 fish. The 2004-2006 average Kenai River Chinook salmon sport fish harvest was 19,962 fish.

## KENAI RIVER CHINOOK SALMON EARLY RUN

### Fishery Management Objectives

In 1988, the Board of Fisheries adopted the management plan for early-run Kenai River Chinook salmon. This plan, amended many times since then, has since 2005 mandated an optimum escapement goal (OEG) of a minimum (5,300 fish) and optimum (9,000 fish) escapement. Currently the *Kenai River and Kasilof River Early-Run King Salmon Management Plan* (5 AAC 57.160) also identifies the possible management actions that can be implemented at given escapement levels. The original and current plan, direct the fishery to be prosecuted without bait to reduce angler efficiency. Bait is permitted, by emergency order, when the optimum escapement goal can be projected. The strategy of restricting bait in the fishery until a given escapement level can be projected has remained an integral component to the management of this fishery. The plan outlines management options and allowable alternatives to assure achievement of the escapement objective.

The fishery begins without the use of bait and is limited to the use of only one, single hook artificial lure. Fishing from guide vessels is not allowed on Sundays and Mondays, and fishing from motorized vessels is not allowed on Mondays, with the exception of Memorial Day. If the escapement is projected to be greater than 9,000 fish, ADF&G shall establish a period in time and area of Kenai River from Skilak Lake downstream to Cook Inlet, by emergency order, in which bait may be used. If the spawning escapement is projected to be less than 5,300 fish, ADF&G can implement trophy fishing provisions that prohibit the retention of Chinook salmon less than 55 inches in total length, or close the Kenai River to retention of all Chinook salmon. Additionally, there are options with the plan that enable fishery managers to protect early-run Chinook salmon in the mainstem of the Kenai River.

### 2007 Inseason Management Approach

The primary objective of inseason management is to achieve a spawning escapement within the OEG range of 5,300 to 9,000 early-run Chinook salmon. Achievement of this escapement objective requires information on the number of early-run Chinook salmon entering the river; the ability to project the total inriver return, and an estimate of the harvest and final spawning escapement.

The number of fish entering the river is estimated by the ADF&G, Sport Fish Division, Chinook salmon sonar in the lower, mainstem Kenai River near river mile (rm) 8.5 (Figure 3). The sonar is usually operational on May 16 and the early-run Chinook salmon passage is estimated daily through June 30. The early-run Kenai River Chinook salmon fishery ends by regulation on June 30. The estimated Chinook passage into the Kenai River for a given day is typically available to fishery managers by noon the following day.

Harvest is estimated inseason by an onsite creel survey. This survey begins on or about mid-May, as soon as water levels rise sufficiently to permit anglers and ADF&G staff to safely use boats on the river downstream from Soldotna. Harvest estimates are typically generated on a weekly basis, but daily estimates can be calculated if required for management actions.

A preliminary estimate of spawning escapement is projected inseason using a mean run timing model. This estimate is based upon the projected inriver return minus the projected harvest (including Chinook salmon mortality associated with catch-and-release fishing).

In order to expedite the dissemination of information regarding the fishery to the public, the Soldotna ADF&G office has two recorded message phone lines. One phone line provides a general weekly fishing forecast and the other offers a brief summary of the weir and sonar counts for major Kenai Peninsula fisheries. A brief summary of the early-run fishery status is provided daily on the message phone as well. The message phone lines may receive several hundred calls daily during the peak of the fishery. The message phone gives the public reliable access to fishery information, and increases the efficiency of the Soldotna ADF&G staff.

The public is also kept informed about the fishery via frequent news releases to newspaper, radio, and TV news media. News releases and requests from the broadcast media are given a priority because they distribute relevant information quickly regarding the status of the fishery and pending management actions.

Restrictive management actions in this fishery are socially and economically disruptive. Informing the public in a timely and efficient manner help minimize these disruptions. Continuous updates regarding the status of the fishery are provided in all available forums prior to the likely date of any specific management action. Whenever possible, ADF&G staff strive to issue formal announcements (news releases) regarding emergency orders that change the management of the fishery at least 24 hours before a given action becomes effective.

## 2007 Fishery Performance

The 2007 preseason forecast of the inriver early-run Chinook salmon return was approximately 18,000 fish, slightly above the long-term average of 16,500 fish. The cumulative sonar passage estimate for the early run was 15,904 fish through June 30 (Table 8). Of 22 years on record, 12 years were higher and 9 years were lower than the 2007 run. After subtracting a preliminary harvest of approximately 4,206 fish for the entire river, the preliminary inseason estimate of escapement was about 11,698 Kenai River early-run Chinook salmon for the 2007 season, above the upper goal range of 5,300 to 9,000 fish. This estimate will be refined in 2008.

Generally poor water conditions with average numbers of Chinook salmon entering the Kenai River resulted in relatively poor catch rates early in the fishery. The fishery was liberalized to allow fishing with bait on June 12 from the mouth of the Kenai River upstream to a point 100 yards downstream of the confluence of the Moose and Kenai rivers. Allowance of bait improved catch rates markedly to above-average levels for guided anglers and to slightly below average for unguided anglers however the resulting harvest was not large enough to contain the estimated escapement within the goal range.

The 2007 season was the fifth year of the 44 to 55 inch total length protected slot limit for early-run Kenai River Chinook salmon. From the creel survey data collected in the lower river below the Soldotna Bridge anglers released approximately 33% (1,300 fish) of the total catch. About 30% (390 fish) of those released were between 44 and 55 inches in total length, the majority (70%) were less than 44 inches. The 2007 season was the fifth year regulations existed requiring all retained trophy Chinook salmon (greater than 55 inch length) be sealed by ADF&G within three days of harvest. One trophy Chinook salmon (caught in 2005) was sealed in May or June during the early-run Chinook salmon fishing seasons between 2003 and 2007.

## KENAI RIVER CHINOOK SALMON LATE RUN

### Fishery Management Objectives

This fishery is managed according to provisions of the *Kenai River Late-Run King Salmon Management Plan* (5 AAC 21.359). Late-run stocks of Kenai River Chinook salmon are caught by the commercial drift gillnet fishery and the commercial set gillnet fishery along the east side of Cook Inlet, both of which target sockeye salmon. Commercial fisheries that intercept late-run Kenai River Chinook salmon are managed under provisions of the *Kenai River Late-Run Sockeye Salmon Management Plan* (5 AAC 21.360). Incidental commercial harvests of these stocks have been the subject of intense allocation debates among recreational and commercial user groups since the early 1980s. As a result, the Kenai River Late-run Sockeye Salmon Management Plan contains provisions to reduce incidental harvests of Kenai River-bound Chinook salmon.

During the spring of 1999, the Alaska Board of Fisheries amended both of these plans. The most significant change was the revision of the biological escapement goal (BEG) and the management actions associated with these objectives. Under the previous Late-Run Kenai River King Salmon Management Plan, the BEG was established as an optimum goal of 22,300 Chinook salmon with management directives centered around projected escapement levels of less than 15,500 fish, 15,500 to 19,000 fish, and greater than 22,300 fish. Under the revised management plan the BEG was established as a range of 17,800 to 35,700 Chinook salmon. Management directives were also established to linked inseason regulatory actions with abundance of sockeye salmon. The current management objective, as outlined in the plan, is to achieve a biological escapement goal from 17,800 to 35,700 Chinook salmon.

### 2007 Inseason Management Approach

The primary objective of inseason management is to attain an overall escapement that falls within the BEG range of 17,800 to 35,700 late-run Chinook salmon. Achieving this objective requires an estimate of the number of late-run Chinook salmon entering the river; an estimate of the harvest; the ability to project the total inriver return, and an estimate of the total harvest and the final spawning escapement.

The inriver return of late-run Chinook salmon is estimated by sonar at rm 8.5. Late-run sonar estimates begin when the late-run fishery opens by regulation (July l) and concludes on approximately August 10. Estimates of inriver return are generated daily and the estimate for any given day is typically available to management staff by the afternoon of the following day. If estimates are required earlier, this request is conveyed to the sonar staff that can, by adjusting schedules, provide counts by the morning of the following day.

Harvest is estimated by onsite creel survey. The late-run creel survey begins July 1 and continues until the end of the fishery. The fishery is closed by regulation on July 31. However, the duration of the fishery may be adjusted by emergency order predicated on the magnitude of the inriver return. Harvest estimates are usually generated weekly. Daily estimates are calculated when needed to aid fishery managers.

The final spawning escapement is projected inseason using a historical, run-timing model. Final spawning escapement is the inriver return (from sonar) less the projected sport harvest (from creel survey). The projected sport harvest includes estimated mortality associated with catch-

and-release fishing practices (Bendock and Alexandersdottir 1992). During most years, the spawning escapement can be projected with reasonable accuracy by July 20.

The large numbers of sockeye salmon migrating during the late run complicate estimation of Chinook salmon passage with the sonar. Consequently, alternative techniques for estimating escapement are also used. Such techniques include estimates based on historical exploitation rates in the recreational fishery and historical exploitation rates in the commercial set gillnet fishery.

The recreational fishery for late-run Chinook salmon in the Kenai River is one of the largest and quite possibly the most controversial fishery in Alaska. Interaction with the user groups affected by management decisions is critical to the successful implementation of any inseason management action.

The Soldotna Sport Fish Division office has two recorded message phones. One phone provides a general weekly fishing forecast, the other a brief summary of spawning escapements, weir counts, and sonar estimates for major Kenai Peninsula fisheries. The latter message phone also provides a brief daily summary of this sport fishery's status. This message phone may receive over several hundred calls daily during the peak of the fishery. These recorded message phones provide the public with reliable access to information, and they also increase the efficiency of the Soldotna ADF&G staff.

Information about the fishery is also communicated to the public through formal news releases and by promptly responding to requests for information from the news media. News releases and requests from the news media are given a priority because they are a quick and efficient way to disseminate information regarding the fishery's status, the management plan which regulates the fishery, and pending management actions.

Restrictive management actions in this fishery are socially disruptive. Informing the public of potential restrictions to the fishery via the recorded message phone and news media contacts can mitigate disruption. Whenever possible, fishery managers try to issue formal announcements pertaining to emergency regulation of the fishery at least 24 hours prior to any management action.

## 2007 Fishery Performance

The pre-season forecast of 51,000 late run Kenai River Chinook salmon was above the average in-river return of approximately 42,000. The cumulative in-river return estimate was 42,979 fish through August 4 when the sonar site was closed for the season. (Table 9).

The preliminary inseason estimated late-run Chinook salmon sport fish harvest of 9,258 fish provided for a spawner escapement estimate of approximately 33,300 fish, which is near the upper range of 17,800-35,700 late run Chinook salmon goal. This escapement estimate will be updated in 2008. The 2007 fishery experienced an overall low harvest relative to the numbers of fish in the return. Overall angler success was considered below average. The harvest rate for guided anglers was about 17 hours per fish and unguided anglers had a harvest rate of 39 hours per fish (Table 10).

A total of five late-run Chinook salmon were brought to ADF&G personnel to be sealed as required for sport caught Chinook salmon over 55” in total length during 2007. Of these five fish, only three were actually over 55” in total length and the remainder of the fish were less than 55” in total length.

The commercial fisheries in the Central District of the Upper Cook Inlet Management Area harvested approximately 12,861 Chinook salmon. Of this commercial harvest, the preliminary data from the fish ticket database indicates that approximately 11,996 were harvested in the eastside setnet (ESSN) fishery (Table 9). The preliminary data from the fish ticket database indicates 2007 ESSN harvest compared closely to the average harvest of approximately 11,909 Chinook salmon since 1986. The 2007 Chinook salmon harvest information will be updated in 2008.

# 2007 KASILOF RIVER CHINOOK SALMON RECREATIONAL FISHERY

## 2008 PROPOSALS TO THE ALASKA BOARD OF FISHERIES CONCERNING KASILOF RIVER CHINOOK SALMON SPORT FISHERY ISSUES

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting Chinook salmon in the Kasilof River:

Proposal Numbers: 225, 226, 227, 228, 229, 230, 231, 232, and 233.

## BACKGROUND AND HISTORICAL PERSPECTIVE

The hatchery stocks of early-run Chinook salmon that return to Kasilof River were originally developed from wild fish in Crooked Creek, a tributary to Kasilof River, approximately 6 miles upstream from Cook Inlet (Figure 4). Currently, research is being done on both returns. For the early-run ADF&G began evaluating escapement numbers and to estimate naturally produced and hatchery stock returns to a weir located at the former Crooked Creek hatchery facility in 2002. In addition, a creel survey has been conducted since 2004 to estimate the catch and harvest of naturally and hatchery produced early-run Chinook salmon. Current research for late-run Kasilof River Chinook salmon is directed to determine a population estimate of this stock as well as spawning distribution and run timing. This research project started in 2005 with a pilot study, and it was continued in 2006 and 2007.

The recreational fishery for early-run Chinook salmon in the Kasilof River occurs from late May through June. The growth of drift boat fishing has increased in this fishery and now the angler effort from drift boats exceeds the shore based angler effort.

The timing of the early-run precedes the commercial set gillnet fishery on the eastside beaches of Cook Inlet. There is, however, a personal use gillnet fishery that occurs from June 15 through June 24 at the mouth of the Kasilof River. This personal use gillnet fishery harvests primarily sockeye salmon returning to Tustumena Lake and small numbers of Chinook salmon which originate from Crooked Creek (Table 11).

The Kasilof River Chinook salmon sport fishery is limited by regulation to January 1 through July 31. During the early run (late May through June 30), the river is open in its entirety to Chinook salmon fishing. During the July late-run fishery, the area upstream from the Sterling Highway Bridge is closed to Chinook salmon fishing to protect spawning fish. The early-run is harvested by relatively large numbers of both shore and boat anglers, whereas the late-run is harvested primarily by boat anglers because discharge of the Kasilof River during July makes it difficult for anglers to effectively fish for Chinook salmon from shore. Participation and harvest is greater for the early-run.

Harvest estimates for early-run and late-run Kasilof River Chinook salmon have been estimated by the Statewide Harvest Survey since 1996. Since 2004, ADF&G has conducted a creel survey to determine the early run harvest and to separate the harvests by hatchery and naturally-produced stock composition. From 2004 to 2007, annual angler harvests leveled off for the early and late-run Kasilof River Chinook salmon sport fisheries (Tables 12-13). From 2002 to 2006 the average angler harvest for early-run Kasilof River Chinook salmon was 3,077 fish (Table 12) and the average angler harvest for late-run Kasilof River Chinook salmon was 914 fish (Table 13).

## KASILOF RIVER CHINOOK SALMON EARLY RUN

### Fishery Management Objectives

The Kasilof River early-run Chinook salmon fishery is supported primarily by stocked Chinook salmon of Crooked Creek origin and supplemented by natural production in Crooked Creek. The Kasilof River early-run Chinook salmon return is managed to ensure that a sustainable escapement goal (SEG) of 650 to 1,700 naturally produced Chinook salmon reach the spawning grounds above Crooked Creek weir and to harvest hatchery produced Chinook salmon. Another objective for this fishery is to generate approximately 35,000 angler-days of annual sport fishing opportunity directed at Chinook salmon in the Kasilof River. The final objective is to stock Crooked Creek with approximately 105,000 Chinook salmon smolt annually.

During 2003, regulations were adopted which prohibited the retention of naturally produced early-run Chinook salmon, and anglers were prohibited from using multiple hooks. Beginning in 2005, retention of naturally produced fish was allowed two days each week; on Tuesday and Saturday. In addition, the Alaska Board of Fisheries granted ADF&G emergency order authority to allow retention of naturally produced early-run Chinook on a third day each week when returns are strong. Thursday was added as the third day each week anglers could retain naturally produced Chinook salmon from the Kasilof River in 2006 and 2007.

### 2007 Inseason Management Approach

Historically no inseason regulation of the Kasilof River early-run Chinook salmon fishery has been required. By regulation, hatchery produced fish are allowed to be harvested seven days each week and either hatchery or naturally produced fish are allowed to be harvested two days per week (e.g., Tuesday and Saturday). In 2006 and 2007, Thursday was added as a third day each week that anglers could retain naturally produced Chinook salmon from the Kasilof River. This emergency order was issued each year during mid-May prior to the peak of the return. Other inseason management activity involved determination of angler success from creel surveys from 2003 through 2007 and then sharing this information with the news media and the public.

### 2007 Fishery Performance

The first management objective, ensuring a sustainable escapement goal of 650 to 1,700 naturally produced Chinook salmon reach the spawning grounds, was met in 2007. A total of 964 naturally produced Chinook salmon and 483 hatchery produced Chinook salmon passed upstream of the weir to spawn (Table 12) for a total spawning escapement of 1,447 fish. The number of angler-days will not be evaluated until the 2007 SWHS estimates become available during the fall of 2008 however the preliminary estimate of angler hours from the creel survey was 56,626 hours of fishing effort. The final management objective, stocking Crooked Creek with 105,000 Chinook salmon smolt annually, was also achieved in 2007.

Since Chinook salmon do not reach the weir at Crooked Creek until the later part of June and early July, run-strength is evaluated from creel survey data. In past years, typically the highest catch rates are observed prior to June 10. In 2007, catch rates were highest from June 6 through June 10 and they declined thereafter. The preliminary estimate of harvest from the onsite creel survey was 2,497 Chinook salmon of which 1,072 fish (43%) were naturally produced (Table 12). The estimated 2007 total return was 4,020 Chinook salmon.

## KASILOF RIVER CHINOOK SALMON LATE RUN

### Fishery Management Objectives

This sport fishery is not specifically addressed in a Board-adopted management plan. ADF&G objectives adopted for this fishery include providing an opportunity for angler participation at a level that can be supported by the fisheries resource and associated habitat. Also, to ensure through appropriate management and research programs, that the Chinook salmon population does not decline below the levels necessary to ensure sustained yield. Harvest has been monitored via the SWHS since 1996 and has averaged 933 Chinook salmon (Table 13).

### 2007 Inseason Management Approach

There has been no inseason management in the history of this fishery. The fishery is managed through existing regulations. These regulations are conservative, permitting a harvest of late-run Kasilof River Chinook salmon downstream from the Sterling Highway Bridge only through July 31. For Chinook salmon 20 inches or more in length, the daily bag and possession limit is one fish and the annual limit for Kasilof River Chinook salmon is five fish.

### 2007 Fishery Performance

There has been no inseason data collected for the management of the Kasilof River Chinook salmon late run. Since 2005, ADF&G research projects have collected information on run timing, spawning distribution, and inriver abundance of late-run Kasilof River Chinook salmon. Catches of Chinook salmon for the research program have been relatively stable from 2005 to 2007. Anecdotal information on run strength or sport fishery performance is also collected inseason. In 2007, anecdotal information from anglers suggests that the 2007 Kasilof River Chinook salmon late run performance was similar to 2006. There have been changes in the commercial fisheries targeting Kasilof bound sockeye salmon in recent years due to large numbers of sockeye salmon passage the ADF&G sonar in excess of escapement needs. These commercial fishery changes included the implementation of terminal commercial fishing periods at the mouth of the Kasilof River annually from 2005 to 2007. These terminal commercial fishing periods are designed to reduce sockeye salmon escapement, however Chinook salmon are also harvested. The total number of commercially harvested Kasilof River bound Chinook salmon during these terminal fishery periods has not been estimated at the time of this publication.

Occasionally, anglers bring in harvested Kasilof River late-run Chinook salmon, over 50 pounds in total weight, to ADF&G to participate in the trophy fish program. The trophy fish program is voluntary and participating anglers receive a “Trophy Fish” certificate for taking fish that meet minimum weight or length standards. In 2007, one “Trophy Fish” certificate was issued to an angler for a late-run Chinook salmon harvested in the Kasilof River.

# 2007 RUSSIAN RIVER SOCKEYE SALMON RECREATIONAL FISHERIES

## 2008 PROPOSALS TO THE ALASKA BOARD OF FISHERIES CONCERNING RUSSIAN RIVER SOCKEYE SALMON SPORT FISHERY ISSUES

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting sockeye salmon in the Russian River and Russian River sanctuary:

Proposal Numbers: 253, and 254.

## BACKGROUND AND HISTORICAL PERSPECTIVE

The Russian River is a clearwater tributary to the Kenai River located near the community of Cooper Landing approximately 100 miles south of Anchorage (Figure 5). Lands bordering this river are federally managed. The public can access the Russian River via the Kenai-Russian River ferry operated by a private concessionaire. The ferry is located at the Kenai National Wildlife Refuge parking area on the north shore of Kenai River just downstream from the confluence with Russian River. Additional access is provided at the Chugach National Forest campground on Russian River (Figure 6).

The drainage supports one of the largest returns of sockeye salmon to upper Cook Inlet and provides one of the largest freshwater recreational fisheries for sockeye salmon in Alaska. In addition, coho, Chinook, and pink salmon also spawn in Russian River drainage as well as resident populations of rainbow trout and Dolly Varden. The drainage is closed to fishing for Chinook salmon but supports recreational fisheries for the other species.

Sockeye salmon return to Russian River during two distinct time periods. An early-run arrives at the confluence of the Kenai and Russian rivers in early June. Because of this early run timing, these fish are not harvested in the upper Cook Inlet commercial salmon fisheries. The primary harvest of these fish occurs in the inriver recreational fishery at the Russian River. Early-run fish typically congregate at the confluence of the Russian and Kenai rivers for several days prior to moving into the clear waters of Russian River. A late-run, part of the larger late-run of upper Cook Inlet sockeye salmon, arrives at the confluence in mid-July and typically migrates directly into Russian River. This run has two discrete components, one that spawns in the upper reaches of the drainage (upstream of the weir) and one that spawns in the lower river reaches (downstream of the weir). The population component that spawns in the lower river reaches are more closely related (genetically) to the mainstem Kenai River sockeye salmon stocks than to the population component spawning upstream of the weir (Seeb et al. 1996). Typically, the spawning escapement of the late-run exceeds that of the early-run. For the most part, spawning locations used by the late-run are distinct from locations used by the early-run. Because of their run timing, late-run sockeye salmon are harvested by a combination of commercial, recreational, and personal use user groups.

The recreational fishery for both early- and late-run sockeye salmon occurs primarily in the lower 3 miles of Russian River and in a 1 mile stretch of Kenai River below its confluence with Russian River. Both runs support intense fisheries. The most recent 10-year (1997-2006)

average harvest of early and late-run sockeye salmon is approximately 38,610 and 24,980 fish respectively (Tables 14-15; Figure 7)

The most recent 10 year average (1997-2006) of combined early and late-run angler effort has averaged 59,133 angler-days per year (Table 4). At times, more than 1,000 anglers simultaneously fish this 4-mile area. The two public campgrounds managed by federal agencies are routinely filled to capacity and are not able to completely meet public demand for access to the fishery. Often long waiting periods and/or reservations are required for parking and camping areas.

In 1993, the Alaska Department of Fish and Game, Sport Fish Division purchased property that adjoins U.S. Fish and Wildlife Service (USFWS) lands along the north shore of the Kenai River directly across from the confluence of Kenai and Russian rivers. The 4.4-acre property, formerly the site of the privately owned Sportsman's Lodge, was purchased for $375,000. This purchase was made with Federal Dingell-Johnson (D-J) funds to provide a launch and take-out area for boat anglers fishing the Kenai River and to provide an additional 50 to 75 parking places for anglers. Purchase of this property and subsequent improvements in 2000 have partially alleviated parking issues in this area during peak days of the fishery.

Historically, as angler effort has increased in this fishery, the regulations governing the recreational fishery have become more restrictive to ensure sustainability of the stock. In 1965, the use of treble hooks was prohibited in an effort to reduce snagging. In 1966, terminal gear was limited to flies and a fly-fishing-only area was designated. In 1967, the Board of Fisheries required that only fish hooked in the head, mouth, or gills could be retained and in 1969, this regulation was amended to include all fresh waters of the Kenai Peninsula. In 1973, the regulation was further amended to require that fish hooked elsewhere than in the mouth be released immediately.

Currently, the sport fishery is restricted to terminal tackle consisting of a single-hook, unweighted fly, with a maximum hook gap of 3/8 inches or less. This measure was implemented to reduce angler efficiency and lessen the angler's ability to snag fish illegally. This affords an increased measure of protection to fish as they near their spawning destinations. In order to protect "schooled" fish that hold in the confluence area of the Kenai and Russian rivers (termed the "sanctuary"), the sanctuary is closed to recreational fishing until the lower end of the early-run escapement range is projected. Only the lower 3 miles of the Russian River drainage, from 100 yards upstream of its mouth to an ADF&G marker 600 yards downstream of the falls, are open to salmon fishing. The upstream portion of Russian River (e.g., above the ADF&G marker below the falls) is permanently closed to all salmon fishing to allow fish to migrate and spawn in the remainder of the drainage.

## RUSSIAN RIVER SOCKEYE SALMON MANAGEMENT OBJECTIVES

Management of this fishery is governed by the *Russian River Sockeye Salmon Management Plan* (5 AAC 57.150). The primary management objective, as directed in the plan, is to achieve an escapement goal of 14,000 to 37,000 early-run sockeye salmon and 30,000 to 110,000 late-run sockeye salmon in the Russian River system. The escapement goal range for both runs have been achieved or exceeded in all years since 1977, based upon the management plan in effect at that time (Tables 14-15; Figure 7).

The Russian River Sockeye Salmon Management Plan recognizes that commercial users as well as mainstem Kenai and Russian River recreational anglers harvest late-run sockeye salmon stocks bound for the Russian River drainage. It stipulates how the burden of conservation shall be distributed between commercial and recreational users. In the event that conservation measures are required to achieve the minimum escapement goal, ADF&G shall restrict Kenai River drainage recreational fisheries. Restrictions to the commercial fishery shall be limited to meeting the inriver escapement goal for Kenai River late-run sockeye salmon as outlined in the *Kenai River Late-Run Sockeye Salmon Management Plan* (5 AAC 21.360).

The SEG ranges for both runs are based on weir counts that have sustained the fishery. Although precise biological data is collected annually at the weir it is not sufficient to devise BEGs. Since the Russian River late-run is a component of the larger late-run returning to the Kenai River drainage, the total returns for late-run Russian River sockeye are not known. To that end ADF&G began an upper Russian River late-run run reconstruction research project in 2006 which uses genetic stock identification. The various mixed-stock marine commercial, personal use and sport fisheries where late-run Russian River fish are potentially harvested are sampled for genetic information. Results of this study should enable ADF&G to estimate harvests of late-run Russian River fish from various fisheries. This new information combined with the weir count data will enable fishery researchers to reconstruct the total return of late-run Russian River sockeye. This will enable ADF&G to better assess sockeye production in the Russian River drainage and ultimately develop a BEG for the late-run.

## 2007 INSEASON MANAGEMENT APPROACH

The early- and late-run fisheries are managed by escapement counted at a weir at the outlet of Lower Russian Lake. In years of low abundance, the escapement is achieved through inseason restrictions to the recreational fishery. In years of high abundance, fishery restrictions are liberalized to provide additional fishing opportunity.

Run strength is determined by examining three indicators: weir counts, instream fish counts, and observed fishery performance. Weir counts are the primary indicator of run strength. Historical sockeye salmon weir counts provide the mean migratory run timing statistics to project inseason abundance and escapement (Tables 16-17). An estimation of run strength can generally be made several days prior to the historic mid-point of the run (June 29 or 30 for the early run and August 5 for the late run). In some years, fish have been late or have held in the Kenai River. Weir counts are supplemented by onsite enumeration of the fish present downstream from the weir, including the area between the weir and the falls, the falls area, lower Russian River, and the sanctuary area (Figure 6). In addition, observed fishery performance in the Kenai River downstream from the sanctuary area for the early-run and throughout the entire fishery in the late-run are used as an indicator of run strength. If inseason restrictions become necessary in order to achieve the escapement goal, the Russian River Sockeye Salmon Management Plan specifies several options to ensure adequate escapement which include: bag limit reductions and closures by area and time in the Russian River as well as the mainstem Kenai River downstream to and including Skilak Lake. When inseason restrictions are implemented, they remain in place until the lower end of the escapement range is projected.

Early-run sockeye salmon returns have been high in recent years and the recreational fishery has often been liberalized inseason. The liberalization of the fishery is generally implemented by opening the 700-yard sanctuary area at the confluence of the Kenai and Russian rivers to fishing.

This area is opened when information indicates the lower end of the escapement range (14,000) will be achieved. The sanctuary area is opened by emergency order for the remainder of the salmon fishing season. Experience has proven that a daytime opening facilitates an orderly expansion of fishing opportunity in the fishery. Late evening and midnight openings are avoided.

During the 2007 season, the early-run Russian River Area sockeye salmon sport fishery was liberalized with the issuance of one Emergency Order (EO; Appendix A3). The liberalization took place on June 18 through the issuance of EO number 2-RS-1-15-07. This EO opened the Russian River Sanctuary Area to fishing for sockeye salmon because ADF&G had determined that the minimum early-run sockeye salmon spawning escapement goal of 14,000 fish would be achieved. No management actions were taken during the late-run fishery.

## 2007 Russian River Sockeye Salmon Early Run Fishery Performance

The weir was operational on June 9, 2007 and the Russian River early-run sockeye salmon recreational fishery opened by regulation on June 11. Sockeye salmon classified as early-run fish are enumerated at Russian River weir through July 14. The lower SEG goal range of 14,000 to 37,000 fish was achieved on June 23. The 2007 final early-run sockeye salmon escapement through the Russian River weir was 27,298 fish (Table 16). Opening of the Russian River sanctuary area at 8:00 a.m., Monday, June 18 provided excellent sockeye salmon fishing opportunity for several days. Overall, sport fishing catch rates were good to excellent from June 11 through about June 25. Thereafter, catch rates declined with the numbers of sockeye salmon returning to the Russian River. The 2007 estimates of fishing effort and harvest estimates will be available when the SWHS is published in mid-2008.

## 2007 Russian River Sockeye Salmon Late Run Fishery Performance

Sockeye salmon classified as late-run fish are enumerated at Russian River weir from July 15 through September 13. The 2007 late-run sockeye salmon escapement through the Russian River weir was 53,068 fish and was within the SEG range of 30,000 to 110,000 fish. This was about 43% below the most recent 10-year (1997-2006) average of 92,930 fish (Table 15). The lower goal range of 30,000 fish was achieved on August 15, 2007. This was 8-days later than anticipated (Table 17) and the lowest late-run escapement count through the weir since 1996 (Pappas and Marsh 2004).

The 2007 Russian River late-run sockeye salmon recreational fishery was a continuation of the early-run fishery beginning on July 15. The fishery was prosecuted without restriction. Sport fishing catch rates were only fair in the Russian River however catch rates were generally better in the Kenai River below Russian River. Unseasonably low water conditions in the Russian River from late-July through August may have caused sockeye salmon to stage in the Russian – Kenai rivers confluence area longer than usual prior to continuing upstream past the weir. The 2007 estimates of fishing effort and harvest estimates will be available when the SWHS is published in mid-2008.

# 2007 KENAI RIVER LATE-RUN SOCKEYE SALMON RECREATIONAL FISHERIES

## 2008 PROPOSALS TO THE ALASKA BOARD OF FISHERIES CONCERNING KENAI RIVER LATE-RUN SOCKEYE SALMON SPORT FISHERY ISSUES

The following proposal published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting late-run sockeye salmon in the Kenai River:

Proposal Number: 278.

### BACKGROUND AND HISTORICAL PERSPECTIVE

The Kenai River originates at Kenai Lake near the community of Cooper Landing and terminates in Cook Inlet adjacent to the city of Kenai. The river is glacial and approximately 82 miles in length. It is paralleled for much of its length by the highway road system making it the most accessible of Alaska's major salmon producing rivers (Figure 8).

Historically, snagging was the traditional harvest method for taking sockeye (red) salmon in the Kenai River. It was generally believed that this species would not strike a lure or accept bait and that conventional (non-snagging) techniques could not be used to harvest these fish. When the number of sport anglers was relatively small, snagging posed neither a biological nor a social problem. However, as the population of Southcentral Alaska expanded and the Kenai River sport fishery increased in popularity, anglers began to oppose the practice as an unethical harvest method. Anti-snagging measures, first adopted at the Russian River, culminated in 1975 with the Board promulgating Alaska's present freshwater anti-snagging regulation. In 1979, snagging was prohibited in salt water within a 1-mile radius of the Kenai River mouth and in 1984 all snagging in salt water north of Anchor Point was similarly prohibited.

Because snagging was no longer a legal harvest method in either fresh or salt water, anglers began to experiment with alternative terminal tackle in an attempt to legally harvest sockeye salmon in the Kenai River. Initial efforts were moderately successful with annual harvests averaging 23,584 sockeye salmon from 1977 through 1981 (Mills 1979-1980, 1981a-b, 1982).

Between 1982 and 1985, the average harvest increased to 48,570. This dramatic increase is attributed to the use of coho flies as terminal gear. The coho flies are drifted along the bank similar to the technique used for a number of years at the Russian River. The belief that sockeye salmon could not be harvested with conventional tackle was gradually dispelled and this innovative technique prompted additional anglers to seek these fish. The change in fishing technique, coupled with relatively clear water in 1982 and 1983, played a large role in the increased harvests. The larger harvests were further influenced by the magnitude of the returns, which exceeded 600,000 sockeye in both 1982 and 1983 (Table 18). A return of only 344,571 fish resulted in a reduced 1984 sport harvest (15,702). Kenai River late run sockeye salmon sport fish harvests from 1985 to 2006 have ranged from 57,213 to 294,287 fish, with a 10-year average (1997-2006) of 224,760 fish (Table 19; Figure 9).

The recreational fishery for sockeye salmon in the Kenai River is characterized by:

1. Large numbers of sockeye salmon must be present to provide acceptable harvest rates.
2. The fishery is short in duration, usually from July 16 to August 5, or approximately 20 days.
3. The fishery is affected by water clarity, i.e. turbid water generally decreases angler efficiency and clear water increases catch rates.
4. Only a percentage of the total angler effort is directed toward sockeye salmon, irrespective of run strength or fishing conditions. This is a result of the Kenai River being a multi-species fishery in July and August, with only a percentage of the total angler effort directed toward sockeye salmon. ADF&G expects a steady increase in angler effort as the population of Alaska increases. Angler participation in the Chinook salmon sport fishery, coho salmon sport fishery, and during even years, the sport fishery for pink salmon, as well as fishing effort for resident rainbow trout and Dolly Varden, account for the remainder of total angler participation.

## KENAI RIVER SOCKEYE SALMON LATE-RUN MANAGEMENT OBJECTIVES

Kenai River late-run sockeye salmon are managed under provisions of the *Kenai River Late-Run Sockeye Salmon Management Plan* (5 AAC 21.360). The Division of Sport Fish manages the inriver sport fishery. Late-run Kenai River sockeye salmon are a component of the harvest of the Upper Cook Inlet commercial fishery managed by the Division of Commercial Fisheries. Since 1999, the Kenai River has been managed to achieve an optimum escapement goal (OEG) of 500,000 to 1,000,000 sockeye salmon. The OEG represents the actual spawning escapement, defined as the inriver sonar estimate less inriver sport harvest above the Soldotna Bridge. The plan also directs ADF&G:

1. to manage Kenai River late-run sockeye salmon primarily for commercial uses;
2. to minimize commercial harvests of Northern District coho salmon, late-run Kenai River Chinook salmon, and Kenai River coho salmon; and provide reasonable opportunity to harvest salmon in those sport and guided sport fisheries; and
3. to manage all fisheries to meet the OEG, achieve inriver goals, and distribute escapements evenly within the OEG range and in proportion to run size.

Inriver goals set in the plan are ranges of sockeye salmon passing the sonar at rm 19 (Figure 8) of the Kenai River, and are derived from three levels of projected run strength. Ranges of projected run strength and corresponding inriver (sonar) goals outlined in the plan are:

| Projected Run Strength | Inriver (Sonar) Goal |
|---|---|
| 1. less than 2 million fish | 650,000-850,000 fish |
| 2. 2-4 million fish | 750,000-950,000 fish |
| 3. greater than 4 million fish | 850,000-1,100,000 fish |

The ADF&G, Division of Commercial Fisheries operates the rm 19 sonar and is responsible for managing UCI commercial fisheries to achieve the inriver (sonar) goals. It is the responsibility of the ADF&G, Division of Sport Fish to assess inriver harvests and take steps to ensure that the OEG range is achieved by issuing Emergency Orders to restrict or liberalize the sport harvest if necessary.

## 2007 INSEASON MANAGEMENT APPROACH

Historically, management of this fishery has changed in concert with changes in the Kenai River Late-Run Sockeye Salmon Management Plan. Prior to the late 1980s, management of the sockeye salmon recreational fishery was accomplished through changes to bag and possession limits. Sport harvests were not large enough to significantly impact spawning escapements. Growth in this fishery during the late 1980s and early 1990s witnessed significantly greater inriver harvests. Because of this expansion of the sport fishery, allocative limits were placed on recreational harvests of sockeye salmon by the Alaska Board of Fisheries.

In 1993, changes were adopted to the management plan by the Alaska Board of Fisheries that restricted the total sport harvest to less than 10% of the sonar estimate when the inriver sonar estimate was within the range of 400,000 to 700,000 sockeye salmon. Based upon the pre-season forecast in 1993, the bag and possession limits were reduced to 2 sockeye salmon per day and sport fishing was prohibited each day from 11:00 p.m. to 6:00 a.m.

In 1994, Commissioner Carl Rosier determined that the provision limiting sport harvests to less than 10% of the sonar estimate, within the range of 400,000 to 700,000 fish, was a guideline harvest level rather than a harvest cap. Based upon this decision, the 1994 season commenced with bag and possession limits of 3 sockeye salmon per day and was prosecuted in a normal manner. On August 3, it was projected the sonar count would exceed 700,000. In accordance with the management plan, the bag and possession limits were increased to 6 sockeye salmon. The 1995 recreational fishery was prosecuted without management intervention. The bag and possession limits were not increased, as the sonar count did not exceed 700,000 fish.

In 1996, the Alaska Board of Fisheries amended the management plan to incrementally increase the inriver escapement goals for late-run Kenai River sockeye salmon. The inriver goal during the 1996 season was established at 550,000 to 800,000 fish. The inriver goal was subsequently increased to 550,000 to 825,000 fish in 1997 and 550,000 to 850,000 fish in 1998. The 1996 and 1997 recreational fisheries were prosecuted in a normal manner with no inseason management actions implemented.

Throughout this time period, management of the inriver recreational fishery relied on sonar estimates of inriver escapement and postseason assessment of the sport harvest from the SWHS. There was no need to assess the recreational harvest of sockeye salmon inseason, provided that the inriver escapement goal could be met. This situation continued because of the buffer or escapement gap between the inriver escapement goal (sonar estimate) and the lower limit of the BEG range. This gap between the lower limit of the BEG and the inriver sonar goal was intended to provide for inriver recreational harvests. If the inriver escapement goal (sonar estimate) is achieved, the recreational fishery could be prosecuted without restriction. This management strategy for the Kenai River recreational sockeye salmon fishery depended heavily upon the successful management of the commercial salmon fishery in UCI to achieve the inriver sonar goal.

In 1998, inseason assessment of the sport harvest in Kenai River and Russian River was necessitated by a poorer than expected return and later run-timing of sockeye salmon stocks into Kenai River. Inseason assessment of sockeye salmon harvest consisted of estimating the contribution of Russian River and Hidden Lake stocks to the total inriver return and applying historical exploitation rates from the mainstem Kenai River and Russian River to estimate harvest. Emergency regulation of the sport, personal use, and commercial fisheries during 1998

was based, in part, upon this analysis. Reliance upon postseason assessment of recreational harvests using the available version of the SWHS was recognized as insufficient by management staff from both fishery divisions. Consequently, during the winter and spring of 1998-1999, a model was developed by the Division of Sport Fish to provide inseason estimates of personal use and sport harvests of late-run sockeye salmon. This model is based upon the average historic exploitation rates derived from the SWHS. Management staff employed this model (mean exploitation rate) during the 1999-2003 seasons. Due to the information gained from those years, management actions for the years 2004-2007 were based on the inseason projected return of Kenai River sockeye salmon to Cook Inlet and the daily sonar passage estimates.

In 2004 and 2005, Kenai River late-run escapements were consistently above established goals because of the timing and patterns of sockeye salmon entering into the Kenai River. The magnitude of the late-run sockeye salmon run during these years enabled the inriver sport fishery to be liberalized (e.g., increasing the daily bag limit for salmon 16 inches or greater in length, other than Chinook salmon, from three fish per day to six fish per day of which only two could be coho salmon). The possession limit was also raised from three to six fish in possession. This liberalization was for all waters of the Kenai River except for the fly-fishing-only waters of the Russian and Kenai rivers.

During 2006, several management actions were implemented for the Kenai River late-run sockeye salmon sport fishery as the result of the later than normal run-timing and pattern of sockeye salmon entry into Kenai River. The sockeye salmon bag and possession limit was reduced from three to one fish per day on July 22, then closed to sport fishing for sockeye salmon on July 25, in all portions of the Kenai River except the Upper Kenai River "fly-fishing only" area. Due to the unanticipated increase in sockeye salmon entering the river, the fishery was subsequently reopened on July 31 with a bag and possession limit of three sockeye salmon per day. The continuing influx of sockeye salmon into the river necessitated further management action to contain the escapement and on August 3, the bag and possession limit was increased to six fish per day.

## 2007 KENAI RIVER SOCKEYE SALMON LATE RUN FISHERY PERFORMANCE

The 2007 preseason forecast for Kenai River late-run sockeye salmon was for a run of approximately 2.4 million fish. This forecasted run size was below the long-term average run-size of just over 3.0 million. In season, the run size was estimated to be in the range of 2.85 to 3.25 million fish. Due to the strength of the 2007 Kenai River sockeye salmon run, the Kenai River sockeye sport fishery bag and possession limits were liberalized.

The actual run initially lagged behind the historic average but increased during the week of July 19-25, when nearly 250,000 sockeye salmon passed the sonar counter. By July 25, the run was projected to exceed 2.0 million fish. Emergency Orders were issued increasing the sport bag and possession limits to six per day and allowing the personal use fishery to operate 24 hours per day. Sport fishery success rates were good to excellent throughout July into the first week of August. Harvest rates in the personal use fishery were also excellent.

Although final estimates for the 2007 sockeye run are not available, preliminary results indicate a total run of about 3.1 million. The number of sockeye salmon past the sonar counter was 867,572 fish. When sport harvest estimates become available in mid-2008, the 2007 Kenai River sockeye salmon spawning escapement is expected to be within the OEG range (500,000-1,000,000).

# 2007 KENAI RIVER COHO SALMON RECREATIONAL FISHERIES

## 2008 PROPOSALS TO THE ALASKA BOARD OF FISHERIES CONCERNING KENAI RIVER COHO SALMON SPORT FISHERY ISSUES

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting coho salmon in the Kenai River:

Proposal Numbers: 279, 280, 281, and 282.

## BACKGROUND AND HISTORICAL PERSPECTIVE

Run timing of coho salmon bound for Kenai River and other Kenai Peninsula systems is slightly later than many Northern District systems. Anecdotal evidence suggests that two runs of coho salmon migrate into Kenai River. Creel surveys conducted from 1991 to 1993 and in 1998 indicate that two distinct runs are not readily discernable from harvest rate data (Clark et al. *Unpublished*). Recoveries of returning adult coho salmon, marked as smolt, in the Kenai River indicate that time of entry and time of spawning are independent of time of marking as smolt (Clark et al. *Unpublished*). As a result, coho salmon in the Kenai River are managed with harvest information and smolt abundance as a single stock.

Coho salmon typically begin entering Kenai River in late July and continue through mid-September, and at much reduced levels into late-November. It is assumed that the Kenai River has the only significant late-season coho salmon run in Cook Inlet. Recreational effort shifts to coho salmon almost immediately after the termination of the Chinook salmon season at the end of July or during the first week in August. The inriver sport fishery occurs downstream from Kenai Lake to the river's terminus at Cook Inlet (Figure 10). Unlike the highly mobile Chinook salmon fishery, the coho salmon fishery is conducted from anchored boats as well as from shore. Beginning in the year 2000, bag and possession limits were reduced to 2 fish per day. Additionally, a 3-day closure was adopted to provide a temporal break between the intensely targeted Chinook salmon fishery at the end of July and the traditional start of coho salmon fishing during the first week in August. In 2002, the Alaska Board of Fisheries adopted the closure as an allocative means to reduce overall harvest of coho salmon by sport anglers as part of the Kenai River Coho Salmon Conservation Management Plan. The plan established a coho salmon fishing season end date of September 30 and also included various restrictions on the use of bait as well as restrictions to guided anglers. Coho salmon fishing regulations were liberalized for the Kenai River by the Alaska Board of Fisheries in 2005. Changes resulted in a net gain in fishing time and area and also incorporated less restrictive fishing methods.

Several liberalizations allowed for the Kenai River coho salmon sport fishery included:

1. A 31 day season extension for coho salmon fishing within the Kenai River drainage: from September 30 to October 31.
2. Bait was allowed through the entire season downstream of the Upper Killey River.
3. The August 1-3 coho salmon fishing closure downstream of Skilak Lake was repealed allowing a continuous season from July 1 through October 31.

4. The regulation prohibiting fishing after a person takes a bag limit of two coho salmon below Upper Killey River was reduced to below the Soldotna bridge allowing a person to continue to fish upstream of the Soldotna bridge.
5. Fishing from a guide vessel was allowed on Monday for species other than coho salmon upstream of the confluence of the Moose and Kenai rivers.

Kenai River coho salmon stocks are subject to commercial exploitation in Upper Cook Inlet (Table 20, Figure 11). Data from a comprehensive coded wire tagging (CWT) program indicated that Kenai River coho salmon stocks were principally harvested in the Central District Eastside Setnet (ESSN) fishery along the entire coastline of the Kenai Peninsula, most of this harvest was taken from the setnet fisheries on Coho and Ninilchik beaches (south of the Kasilof River) (Carlon and Hasbrouck 1996-1998; Massengill and Carlon 2004a-b, 2007a-b; Massengill *In prep*). The majority of the harvest of Kenai River coho salmon occurs in the Kenai River recreational fisheries (Table 20, Figure 11).

Kenai River coho salmon are also harvested in personal use and subsistence fisheries. In 1981 and 1983 through 1993, there was a fall personal use or subsistence set gillnet fishery for coho salmon on the eastside beaches of Central District in Cook Inlet that were open to commercial setnetting (Table 20). This fishery was open in September, and therefore harvested late-running coho salmon. In 1985 and 1991 through 1994 there was also a subsistence set gillnet fishery on Central and Northern District beaches that were open to commercial setnetting. This fishery was generally open on scheduled days from May through September, with the open periods concentrated in July (Brannian and Fox 1996).

Kenai River coho salmon are also harvested in the Kenai inriver personal use dip net fishery (Table 20). This fishery has existed in various forms in most years since 1981 and targets Kenai River sockeye salmon in late July and early August. It is described in more detail in the Kenai River Sockeye Salmon Dip Net Fishery section of this report. In March 1997, the Alaska Board of Fisheries changed the closing date of this fishery from August 5 to July 31, to reduce the harvest of coho salmon. The personal use fishery was extended from August 3-10 during 2006 due to a late return of sockeye salmon to Kenai River.

A creel survey was conducted in Kenai River downstream from Soldotna from 1976 to 1993. The survey provided inseason harvest, harvest per unit effort, and angler participation estimates for this area of the river. These data were used postseason to track the relative status of the fishery and were not intended for inseason management of the fishery. Assuming that harvest is positively related to coho salmon abundance, numbers of late-run Kenai River coho salmon (with allowances for annual variation) appeared relatively stable through 1992. In 1993, budget managers determined that the creel survey would not be funded after the 1993 field season. Consequently, no onsite creel surveys were conducted from 1994 to 1996. The survey was reinstated in 1997 and 1998. Creel survey estimates for both years were similar to estimates from the SWHS. Therefore, the SWHS estimates were reported as the final estimates.

Despite relatively stable harvests in the recreational fishery through the early 1990s, fisheries managers became increasingly concerned that the current harvest levels could not be sustained.

The Division of Sport Fish began a stock assessment program in 1992 which focused upon the estimation of annual smolt production as an indicator of future abundance (Carlon 2000, 2003; Carlon and Hasbrouck 1997-1998). Data from this program indicated a decline in smolt

abundance from approximately 1,000,000 from 1992 to 1993 to less than 500,000 in 1995. Because this decline in smolt abundance was likely to result in reduced adult returns to the Kenai River, the Alaska Board of Fisheries addressed this fishery in March 1997.

In 1998, the Division of Sport Fish began an adult coho salmon tagging program to estimate the number of adult coho salmon returning to Kenai River. This program provided data to estimate the number of adult coho salmon returning to the Soldotna Bridge with acceptable levels of accuracy and precision from 1999 through 2004. In addition, this inriver estimate in combination with the sport harvest data from the SWHS enabled ADF&G to estimate total returns, spawning escapement, and exploitation of Kenai River coho salmon. These estimates, combined with the smolt abundance estimates, also provided estimates of smolt to adult survival.

From 1999 to 2004 the coho salmon returns averaged about 140,000 fish with harvests averaging just over 62,000 fish. From 2000 to 2004 exploitation rates ranged from about 35% to 47%. Smolt abundance ranged from nearly 580,000 to 1,200,000 with marine survival ranging from 6 to 32% (Carlon and Evans *In prep.*; Massengill and Evans *In prep.*).

Since 2005, the focus of the coho salmon stock assessment program was to estimate smolt abundance through a mark-recapture project. In this project, smolt were tagged in the spring and early summer at Moose River. Fish wheels operated upstream of the Soldotna Bridge at river mile 28 captured returning adults to enable an estimate of the number of smolt leaving the system. Smolt tagging was discontinued in 2007 and returning adults will be sampled for tags through 2008.

Annual sport harvests of Kenai River coho salmon have increased from 9,537 fish in 1977 to a record high of 86,711 fish in 1994 (Table 21). The most recent 10 year average sport harvest (1997-2006) of Kenai River coho salmon is 43,331 fish.

## KENAI RIVER COHO SALMON MANAGEMENT OBJECTIVES

In March 1997, the Alaska Board of Fisheries (BOF) adopted the *Kenai River Coho Salmon Management Plan* (5 AAC 21.357). This plan contained regulations that reduced the total (combined sport and commercial) harvest by approximately 20%. In the spring of 2000, the BOF amended this plan again and adopted it as the Kenai River Coho Salmon Conservation Management Plan. It contains management directives and outlines the burden of conservation between various user groups in the NKPMA**.** It directs ADF&G to minimize the incidental take of Kenai River coho salmon stocks in the commercial fishery. It also directs ADF&G to manage Kenai River coho salmon stocks primarily for sport and guided sport uses in order to provide fishermen with reasonable opportunity to harvest these stocks over the entire run, as measured by the frequency of restrictions.

Prior to the February-March meeting of the Alaska Board of Fisheries in 1999, early-run Kenai River coho salmon were addressed in the *Upper Cook Inlet Salmon Management Plan* (5 AAC 21.363). This Board-adopted management plan directed ADF&G to minimize the harvest of this species in the Cook Inlet commercial salmon fishery. In 1999, the Board amended this plan. All instructions pertaining to the allocation of Upper Cook Inlet salmon stocks were removed from this plan and placed into the respective, individual management plans covering specific stocks or species. The provisions the Board must consider when adopting management plans for the Upper Cook Inlet area were incorporated into this plan as well. Provisions included are; the need

for sustainable fisheries, habitat protection, and recognition of the needs and demands of various user groups.

In 2005 the Kenai River Coho Salmon Conservation Management Plan was repealed. The resulting plan, *Kenai River Coho Salmon Management Plan* (5AAC 57.170) provides the current regulatory framework and guidelines for management to ensure an adequate escapement of coho salmon into Kenai River.

In addition to the aforementioned management plan, department objectives are:

1) To provide opportunity for angler participation at a level that can be supported by the fisheries resource and associated habitat.
2) To ensure, through appropriate management and research programs, that the spawning escapement does not decline below levels necessary to ensure sustained yield.

## 2007 INSEASON MANAGEMENT APPROACH

Currently, there are no cost effective methods available to accurately estimate the inriver coho salmon return inseason. Because of the lack of quantitative data to assess coho stock status, an escapement goal has not been established. With the exception of 1997, there has been no inseason management of this fishery.

Inseason fishery performance was gauged by fish wheel catches from the coho salmon stock assessment program, through direct observation by research and management staff, and by information provided by anglers. Escapement is not estimated from ADF&G fish wheels inseason. In 2007, the capture rates from this project indicated that the Kenai River coho salmon run size as estimated by the index was low in magnitude. The number of coho salmon captured in the fish wheels was the lowest since the project's inception in 1999.

The Statewide Harvest Survey is currently used to assess the Kenai River coho salmon fishery performance postseason (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). Results from this survey are typically available during the year following the season. A comprehensive CWT project in Cook Inlet has estimated the annual smolt outmigration from the Moose River drainage. These estimates were previously thought to be a useful management tool, under the assumption that there is a correlation between the magnitude of smolt outmigration and the magnitude of total return. However research results indicate that the correlation is weak due to variation in smolt to adult survival. The Moose River smolt abundance data is not used as an indicator of potential returns of coho salmon stocks to Kenai River rather they define coho salmon production for one tributary of the Kenai River drainage.

## 2007 KENAI RIVER COHO SALMON FISHERY PERFORMANCE

The Kenai River coho salmon creel census program was discontinued prior to the 1999 season. No inseason catch, harvest, effort, or escapement creel census data were collected from 2004 through 2007. Inseason run strength and fishing success were gauged by reports volunteered by guides and individual anglers. Final harvest estimates are provided by the SWHS. This information typically becomes available during the spring of the following year.

ADF&G's inseason coho salmon monitoring project is not designed to determine escapement of coho salmon into Kenai River, however the data collected annually can be compared to other years. The fish wheel catches of coho salmon have been used to index the coho salmon run

strength. The index was derived from years when abundance was available (1999-2004) and uses the functional relation between fish wheel coho salmon catch rates and the inriver abundance of coho salmon to describe the magnitude of the return as high (>120,000 fish), medium (50,000–120,000 fish) or low (<50,000 fish) inseason. The Kenai River Coho Salmon Management Plan was established to prevent the over exploitation of the stock in times of average or below average returns. Although no estimate for the total return of coho salmon to Kenai River is available for 2007, the fish wheel index suggests the return was below average (50,000 fish).

Based on reports from anglers the 2007 Kenai River coho salmon fishery started out very slow but improved throughout the season. Poor to fair coho salmon catches were reported in early to mid-August, though catch rates steadily improved and were considered good by mid- September. Coho were caught throughout the drainage and the run timing appeared to be normal with bright fish present throughout the run.

# 2007 NORTH KENAI PENINSULA MANAGEMENT AREA RESIDENT SPECIES RECREATIONAL FISHERIES

## 2007 KENAI RIVER RAINBOW TROUT RECREATIONAL FISHERY

### 2008 Proposals to the Alaska Board of Fisheries Concerning Kenai River Rainbow Trout Sport Fishery Issues

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting rainbow trout in the Kenai River:

Proposal Numbers: 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, and 246.

### Background and Historical Perspective

The Kenai River is the most heavily utilized river for freshwater sport fishing in Alaska and one of the largest rainbow trout fisheries in the United States. Although most of the anglers participate in the river's salmon fisheries, the Kenai River drainage also supports a major rainbow trout fishery with catches ranging from 8,720 to 159,510 fish, annually (Table 22, Figure 12).

Increasing public concern for the rainbow trout resource and a scarcity of biological and fishery data from the early years of the fishery prompted the Alaska Board of Fisheries to adopt increasingly restrictive regulations, implemented in the years outlined below:

| | |
|---|---|
| 1959-1964 | Season: Areawide spring closure from April 1 to about May 26. |
| | Daily bag limit: Combined trout/char/grayling/salmon under 16 inches: 10/day, only 2 over 20 inches. |
| 1965-1977 | Season: Kenai River changes to no closed season. |
| 1978 | Daily bag limit: (Areawide) Combined trout/char/grayling/salmon under 16 inches: 10/day, only 1 over 20 inches. |

1979 Yearly bag limit: (Areawide) Harvest record required for rainbow/steelhead trout over 20 inches - 2/year.

1980-1981 Yearly bag limit: (Areawide) Increased to 5 rainbow/steelhead trout over 20 inches.

Gear restriction: (Kenai River) In flowing waters upstream from the Moose River to Kenai Lake only single-hook, artificial lures allowed from January 1 to May 31.

1982-1983 Season: (Kenai River) Spring closure from January 1 to June 14 (excludes Skilak Lake).

Daily bag limit: (Areawide) Changed to 5 rainbow trout with only 1 over 20 inches.

1984-1986 Season: (Kenai River) Spring and fall closure from November 1 to June 14 (includes Skilak Lake).

Daily bag limit: (Kenai River) Changed to 3/day, only 1 over 20 inches.

Yearly bag limit: (Areawide) Rainbow/steelhead trout over 20 inches - changed to 2/year.

Gear restriction: (Kenai River) In addition to spring single-hook, artificial lure restriction, only artificial lures may be used between Skilak and Kenai lakes from January 1 to December 31.

1987-1988 Season: (Kenai River) Spring and fall closure from November 1 through June 14 (includes Skilak Lake).

Daily bag limit: (Kenai River) Reduced to 2/day; 1 daily over 20 inches.

Yearly bag limit: (Areawide) Rainbow/steelhead trout over 20 inches - remained at 2/year.

Gear restriction: (Kenai River) Artificial lures only upstream from Skilak to Kenai Lake. Single hook restriction repealed. No bait permitted in Skilak Lake and in the Kenai River downstream to Moose River from November 1 through May 31.

1989-1990 Area between Skilak and Kenai lakes designated a Trophy Trout Area. Only trout 20 inches or larger could be retained. Susitna-West Cook Inlet seasonal limit remained at two trout over 20 inches. Terminal tackle in upper Kenai River limited to single-hook artificial lures.

1991 Trophy Trout Area extended to include half-mile radius of Skilak Lake inlet. Minimum length of trophy trout increased to 24 inches.

1993 Length at which a trout in the Trophy Trout Area could be retained increased to 30 inches. The bag and possession limits for trout in Skilak Lake and the Kenai River downstream from Skilak Lake were reduced to one fish. The Trophy Trout Area was closed to <u>all</u> fishing from April 15 through June 10.

1997 Former Trophy Trout Area becomes Catch-and-Release Area. Area extended 1/4 mile into Kenai Lake. No retention of trout permitted in this area and no retention

permitted in the flowing waters upstream of Kenai Lake. Trout season in all waters of the Kenai River drainage is now June 15 through April 15. All flowing waters upstream of the Upper Killey River closed to all fishing from April 15 through June 14. From June 15 through October 31 in all lakes tributary to Kenai Lake supporting wild trout the daily bag and possession limits are 2 trout only 1 of which may be 20 inches or greater.

From November 1 through April 14 the bag and possession limits in lakes supporting wild trout are five; only one may be 20 inches or greater. The bag and possession limits were not changed in stocked lakes.

1998 The use and placement of beads was regulated in all flowing waters of the Kenai River drainage. Beads must be either fixed to the line, or hook or be free moving on the line or leader. A bead not attached to the hook has been defined as an attractor, not a fly.

In Slikok Creek a tributary of the lower Kenai River, the fishing season for rainbow trout was established as August 16 through April 14.

2002 Established a maximum size limit of <18 inches in all waters of the Kenai River from the mouth of the Moose River upstream to Skilak Lake with a limit of 1 daily/1 in possession. Allow the use of beads fixed on the line within 2 inches of fly, lure, or hook throughout the drainage and clarified the single-hook regulation to mean one single hook.

2005 Rescinded the catch-and-release only regulation for rainbow trout in the upper Kenai River area by establishing a harvest limit for rainbow trout of 1 daily/1 in possession under a maximum size limit of <16 inches in flowing waters of the Kenai River drainage above Skilak Lake (upper river) and established a harvest of rainbow trout 1 daily/1 in possession under a maximum size limit of <18 inches in all waters of the Kenai River downstream of and including Skilak Lake. The spring spawning seasonal closure was aligned throughout the drainage, designated from May 2 through June 10. Reduced the limit in the Moose River drainage lakes and ponds from 5 daily/5 in possession to 2 daily/2 in possession and in flowing waters of the Moose River drainage from 2 daily/2 in possession to 1 daily/1 in possession under a maximum size limit of <18 inches.

In 1986, ADF&G, in conjunction with the University of Alaska, School of Fisheries and Ocean Sciences in Juneau, initiated a study of Kenai River rainbow trout. The long-term goal of the study was to compile population and fishery databases for use in formulation of a drainage-wide management strategy for Kenai River rainbow trout.

The 1986 pilot study (Lafferty 1989) had two major components: (1) a creel survey, and (2) a mark-recapture program designed to estimate the trout population in section 004 from Jim's Landing upstream to the powerline near Russian River (Figure 13). The rainbow trout population estimates for section 004 were 3,663 fish in 1986 and 4,947 fish in 1987. In 1987, the study was expanded to include two sections of the river below Skilak Lake in the middle river (Lafferty 1989; Figure 13 – sections 002 and 003).

Lafferty (1989) concluded that the best estimates of rainbow trout, 150 mm (6 inches) or greater in length, for the two river sections was 610 and 1,750 fish, respectively. This study also concluded that these estimates were likely biased low.

In 1995, the population estimate was repeated in section 004 (Hayes and Hasbrouck 1996). Data analysis in 1995 included a reevaluation of the 1986 and 1987 data to provide comparable estimates. Estimates of abundance of rainbow trout, 300 mm (12 inches) or greater in length, in section 004 in 1986, 1987, and 1995 were 2,520, 3,472, and 5,598 fish, respectively. This study concluded that the rainbow trout population in the upper Kenai River had increased and that there was an increased number of rainbow trout in each segment of the population from 12 to 22 inches in length divided into 2-inch intervals. The proportion of rainbow trout at least 20 inches in length remained constant at 11%-13% all 3 years estimates were made but the proportion of fish from 18-20 inches in length was much greater in 1995. It was further concluded the upper Kenai River rainbow trout population was maintaining itself at a high level and that section 004 could serve as an index of abundance of the upper Kenai River rainbow trout population.

In 1998, additional research was instituted to reassess the population of rainbow trout in the Kenai River drainage. This study was a multi-year study that addressed multiple sections of the river. Primary aspects of this work were to repeat the mark-recapture programs in the area below Skilak Lake and in the upper river section to compare population estimates among years (Larson and Hansen 2000; King and Breakfield 2007). Radio telemetry procedures were used to identify life history and population characteristics such as seasonal movements, distribution, mortality, and abundance of upper river rainbow trout. Lastly, maturity samples were collected from upper river rainbow trout to define the time of spawning and to identify important spawning locations.

The middle river estimate of abundance in 1999 was 7,882 fish, compared to 1,750 fish during 1987 (Larson and Hansen 2000). The estimated number of rainbow trout had increased by 400% in the 12 year between studies. Final conclusions were that the population was increasing and the numbers of fish in each size class were increasing, with the exception of large fish (those over 24 inches in length). Over this same period, rainbow trout catches in the middle river increased from 6,430 fish in 1987 to 32,050 fish in 1999 (Table 22). Harvest remained relatively stable and averaged about 802 fish from 1987 to 1999.

In 2001 the fourth rainbow trout population estimate in 16 years was derived for the upper river index area (King and Breakfield 2007). The estimated number of rainbow trout, 12 or more inches in length, increased from 5,598 fish in 1995 to 6,826 fish in 2001 and was nearly 300% higher than the population size estimated in the mid-1980s. The increase was attributed to higher numbers of fish in each length class less than 22 inches. The number of large fish was less than the numbers previously estimated during the mid-1980s as well as 1995. The reported catch of rainbow trout in the upper river from 1986 to 1987 averaged 2,945 fish. The upper river catch increased to 33,475 fish in 1995 and 78,836 fish in 2000 (Table 22).

Based on these positive findings about the status of the upper and middle Kenai River rainbow trout stocks, ADF&G did not have a concern for the health of the stocks.

## Kenai River Rainbow Trout Management Objectives

Management objectives for this fishery were first developed from and were contained in the Cook Inlet and Copper River Basin Rainbow/Steelhead Trout Management Policy (CIRTMP; ADF&G 1987). This policy was adopted by the Alaska Board of Fisheries in 1986 for Cook

Inlet waters, and was amended in 1988 to include the Copper River Basin. This plan was replaced in 1998 by the *Criteria for establishing management areas for trout* (5 AAC 75.013). This plan was replaced by the *Special management areas and liberal harvest opportunities for trout* (5 AAC 75.210) in 2003. This plan establishes the criteria for considering proposed regulatory changes for bodies of water that would diversify sport fishing opportunity through the liberalization of harvest opportunities for rainbow trout.

As specified in the plan, the Kenai River rainbow trout fishery is managed for sustained yield. The fishery provides a diversity of sport fishing opportunities for wild rainbow trout through establishment of special management areas by regulation. These management areas provide for diverse fishing practices as well as modest harvest opportunity.

Fishery objectives for the Kenai River rainbow trout fishery are:

1) To provide the opportunity for angler participation at a level that can be supported by the fisheries resource and associated habitat.

2) To ensure, through appropriate management and research programs, that the trout population does not decline below levels necessary to ensure sustained yield.

## 2007 Inseason Management Approach

The Kenai River rainbow trout fishery is highly restricted and inseason management is directed largely by regulation. The adoption of the rainbow trout spring spawning season fishing closure in 2005 resulted in a net gain in fishing time and fishing area for rainbow trout anglers in the Kenai River drainage because anglers are still allowed to fish for Dolly Varden in the middle and lower Kenai River below Skilak Lake during the spring closure. A growing segment of the sport fishing public has participated in the middle river Dolly Varden fishery each year during the closure (May 2 – June 10). Few Dolly Varden are present in this area of the river and relatively few are caught, whereas many rainbow trout are caught and released during the rainbow trout spring spawning season closure. Consequently, an emergency order was issued during 2006 and 2007 to prohibit removal of rainbow trout from the water prior to their release. This emergency order was issued to discourage illegal fishing activities and to protect spawning rainbow trout. Currently, the rainbow trout populations in the Kenai River watershed are considered to be relatively robust. ADF&G received anecdotal information that suggests the sport fishing effort for rainbow trout in the Kenai River is increasing, especially below Skilak Lake. SWHS data for 2007 may help verify this perceived trend of increased catches and harvests when it becomes available in mid-2008. At that time, ADF&G will be able to determine if additional restrictions are needed.

## 2007 Fishery Performance

Sport harvest and catch for the Kenai River rainbow trout fishery is determined by the Statewide Harvest Survey (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). Total catches of Kenai River rainbow trout have been increasing steadily since the mid-1980s (Figure 12). The most recent 10-year (1997-2006) average catch and harvest, as determined from the SWHS and creel surveys, is 113,320 and 2,720 fish respectively (Table 22). The most recent 10-year (1997-2006) average percent of rainbow trout retained of fish caught in the flowing waters of the Kenai River is only 2.5%. ADF&G estimates that the 2007 total catch and harvest of rainbow trout will be above the most recent average.

Retention of rainbow trout by anglers has increased slightly since the mid to late 1990s (Table 22; Figure 14). Retention of fish in the former catch-and-release fishery between Kenai and Skilak lakes has been allowed since the 2005 season for trout that are 16" or less. As numbers of retained rainbow trout increased, the overall percentage of retention has declined due to more anglers participating in the fishery. These lower rates of retention may indicate that more anglers have adapted a catch-and-release philosophy. The percentage of the total number of rainbow trout caught in the Kenai River in 2006 that were retained dropped to 1.9% (Table 22). This is the lowest percentage on record for fish retention. ADF&G predicts that this trend will continue and the 2007 catch and harvest data will be similar to 2006 data. This data will be available in the 2007 SWHS release in mid-2008.

Anglers reported fair to good rainbow trout fishing in the Upper Kenai River in June and July. Fish size was reported to be average when compared with previous years. Late summer and fall fishing was reported to be very good. Anecdotal information suggests that the rainbow trout and Dolly Varden fishing was considered slightly below average through the spring and early summer, but picked up in August when the sockeye salmon started spawning. In both the middle river (between Skilak Lake and Moose River) and the lower river, incidental catches of rainbow trout and Dolly Varden were reported to be similar to recent years. ADF&G did not receive anecdotal reports during the season that indicated that the rainbow trout stocks in the Kenai River were declining, failing, weak, or that fish size had changed appreciably.

## 2007 KENAI RIVER DOLLY VARDEN/ARCTIC CHAR RECREATIONAL FISHERIES

### 2008 Proposals to the Alaska Board of Fisheries Concerning Kenai River Dolly Varden/Arctic Char Sport Fishery Issues

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting Dolly Varden/Arctic Char in the Kenai River drainage:

Proposal Numbers: 238, 239, 240, 242, 243, 244, 245, 246, 247, and 248.

### Background and Historical Perspective

Dolly Varden are harvested in all areas of Kenai River. Harvest and catch of this species is determined by the Statewide Harvest Survey (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). The open season for Dolly Varden fishing is January 1 through December 31, except in those areas of the river upstream of Skilak Lake, where more restrictive seasons apply. Prior to 1984, the bag and possession limit was 10 Dolly Varden of any size. Beginning in 1984, this limit was reduced to five Dolly Varden of any size. In 1990, the Alaska Board of Fisheries chose a more conservative management approach and reduced the daily bag and possession limit for the upper Kenai River to 2 fish, only 1 of which could be 24 inches or larger. The bag and possession limit for the remainder of the drainage was unchanged until 1992 when the Alaska Board of Fisheries reduced the limit from 5 to 2 fish of any size. In 1996, the limit for all Kenai Peninsula flowing waters was reduced to 2 fish. A season from June 15 through April 14 was also established as was a bag and possession limit of 2 fish that included a protected slot limit prohibiting retention of fish between 12 and 24 inches. In 1998 spawning season closures were

established in three upper Kenai River tributaries that were identified as important for Dolly Varden production. Fishing was prohibited from September 15 through October 31 in Cooper Creek, Quartz Creek, and Snow River.

The Kenai River is assumed to support both a resident and an anadromous Dolly Varden population. Only limited biological information is available regarding both populations. Resident fish are believed to inhabit the entire river, including both Skilak and Kenai lakes. Seasonal movements of these resident fish are not known, but it is assumed that a percentage of the stream-residing fish overwinter in Skilak and Kenai Lakes. The anadromous population is believed to enter Kenai River in July and it is assumed that some of these fish also overwinter in Skilak Lake and probably Kenai Lake. Dolly Varden outmigrate from both of these lakes in April and May. Harvest estimates presented in Table 23 do not differentiate between resident and anadromous populations of Dolly Varden.

A Kenai River Dolly Varden study was initiated in 1996. The primary objective of this study was to locate major staging areas of Dolly Varden within the Kenai River watershed upstream of Skilak Lake. Future Dolly Varden studies will investigate the age, maturity and availability of Dolly Varden in these locations.

A number of staging areas, where Dolly Varden congregate, have been located by deploying various trapping devices and conducting visual observations. The United States Fish and Wildlife Service conducted a Dolly Varden radio-telemetry study. During 1998 and 1999, radio transmitters were placed in Dolly Varden in the Kenai River, selected tributaries, and Skilak and Kenai lakes. The radio-telemetry study provided information on major staging areas, seasonal fish movements, and overwintering areas.

Research findings indicate Dolly Varden occupy most tributary streams to Kenai Lake and the Kenai River. Staging areas containing spawning fish were identified in Quartz, Summit, and Cooper creeks and the Snow River; Quartz Creek and its associated tributaries was also suspected of being one of the major spawning populations upstream of Skilak Lake. To date, no major Dolly Varden staging areas have been located within Kenai Lake during summer or fall. Radio-telemetry data indicate Dolly Varden prefer traveling throughout the pelagic zone of Kenai Lake during the summer and fall rather than the shoreline. During winter, may frequent the area around Porcupine Island. Porcupine Island is one of the few areas within Kenai Lake having a shallow gravel bottom, and may be preferred overwintering habitat for Dolly Varden.

During the 2002 Alaska Board of Fisheries meeting, changes were made pertaining to size retention and bag and possession limit of Dolly Varden. In the Kenai River drainage upstream of the Upper Killey River, the protected slot limit was removed and the daily limit was changed to 1 per day and 1 in possession less than 18 inches in length. In 2005, the Alaska Board of Fisheries aligned the Dolly Varden regulations in the Kenai River to be the same or similar to those for rainbow trout. The daily and possession limit remained 1 fish however the maximum length of a Dolly Varden was restricted to < 16 inches in waters above Skilak Lake with a season of June 11 through May 1. In the Kenai River below Skilak Lake the bag and possession limit was reduced to 1 fish < 18 inches and the season was open the entire year.

## Kenai River Dolly Varden Management Objectives

This Dolly Varden fishery is not directly addressed in a management plan adopted by the Alaska Board of Fisheries.

Department objectives for this fishery are:

1) To provide the opportunity for angler participation at a level that can be supported by the fisheries resource and associated habitat.

2) To ensure, through appropriate management and research programs that the Kenai River Dolly Varden population does not decline below the level necessary to ensure sustained yield.

### 2007 Inseason Management Approach

Inseason management has not been required in this fishery. The fishery is managed by existing regulations. Populations of Dolly Varden currently appear to be robust.

### 2007 Fishery Performance

This fishery is not creel surveyed or monitored inseason. Harvest estimates are derived from the Statewide Harvest Survey (SWHS; Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). Catch for this species was first estimated by the SWHS in 1990. Estimates reflect a fishery with a peak harvest in 1984 of 31,407 fish (Table 23; Figure 15). The significant decline for 1986 and 1987 harvests is attributed to the more restrictive bag limit (5 fish) and adoption of a voluntary catch-and-release philosophy. Harvests from 1988 through 1993 stabilized at 10,000 to 15,000 fish. The most recent 10-year average (1997-2006) Dolly Varden harvest from the Kenai River is 5,980 fish (Table 23). This decline is likely due to more conservative regulations.

The 2006 SWHS estimate of the total Dolly Varden catch in Kenai River is the sixth highest on record, but the total harvest is the lowest on record, indicating that more anglers are practicing catch-and-release (Table 23). The 2006 percentage of Dolly Varden retained per fish caught of 3.3% is the lowest percentage of retained fish on record and this percentage is slightly above half of the total percentage of the most recent 10 year average (1997-2006) of 6.5%. The trend of anglers retaining low percentages of Dolly Varden caught in the Kenai River sport fisheries is expected to continue. ADF&G projects that the 2007 season's sport fishing effort and harvest should be similar to the 2006 season. The SWHS will provide 2007 season data when it is released in mid-2008.

## 2007 HIDDEN LAKE LAKE TROUT RECREATIONAL FISHERIES

### 2008 Proposals to the Alaska Board of Fisheries Concerning Hidden Lake Lake Trout Sport Fishery Issues

The following proposal published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting lake trout in Hidden Lake:

Proposal Number: 249.

### Background and Historical Perspective

Lake trout harvest at Hidden Lake is estimated through the SWHS (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). Catches and harvests in this fishery have been variable however,

and both have declined over the past decade (Table 24). Historically, lake trout harvest regulations were liberal. The bag limit was 10 lake trout per day between 1948 and 1968. In 1969, the bag limit remained at 10, of which only 2 were allowed to be over 20 inches. In 1983 the fishery was liberalized to allow a bag limit of 12 lake trout: 2 over 20 inches and 10 under 20 inches. The fishery was prosecuted under these regulations through 1996. In 1997, the regulations changed to 2 fish per daily and 2 fish in possession regardless of size.

The regulation changes are reflected in the SWHS estimates as the harvest dropped sharply from 1,131 fish in 1996 to 524 fish in 1997 (Table 24). Prior to 1997, the average harvest was about 1,350 fish and dropped to an average of approximately 400 fish following the regulation change. Although harvests estimated in 1994 and 1995 are lower than some of the earlier estimates, they are still within the range of historic harvests (619 to 3,761 fish). The regulation change likely contributed to the change in harvest. The relation between lake trout abundance and harvest is unclear and cannot be identified from this data. Based on comparisons of harvests from lake trout fisheries elsewhere in Alaska as well as analysis of available data from Hidden Lake, historic harvests of lake trout were relatively high indicating the stock may have been overexploited.

Lake trout catch has been estimated by the SWHS since 1990. The estimates for fishing effort (reported in angler-days) have declined considerably since 1997 over those observed historically. Fishing effort in this survey is the total fishing effort for Hidden Lake and includes effort directed at other species (sockeye salmon, kokanee, and rainbow trout). No relation between the number of lake trout caught and effort can be discerned. Lake trout harvest and catch have been variable since 1997, while effort has been relatively stable (Table 24). Reasons for the decline in participation in the Hidden Lake sport fishery are unknown.

Historical data about the size composition of the lake trout of Hidden Lake was collected by ADF&G in 1960, 1961, 1965 to 1967, 1975, and 1987. A creel survey to estimate harvest was conducted by the USFWS from 1992 to 1994. Comparison of the length of lake trout in these samples across years indicated the sizes were similar. Therefore, the length distribution of lake trout in Hidden Lake did not changed during these years.

## Hidden Lake Lake Trout Management Objectives

This fishery is not specifically addressed in any management plan adopted by the Alaska Board of Fisheries. ADF&G objectives for this fishery are:

1) To provide the opportunity for angler participation at a level that can be supported by the fisheries resource and associated habitat.

2) To ensure, through appropriate management and research programs that the Hidden Lake lake trout population does not decline below the level necessary to ensure sustained harvest.

## 2007 Inseason Management Approach

Inseason management has not been required in this fishery. The fishery is managed by existing regulations. Populations of lake trout however currently appear to be declining as indicated from catch and harvest data obtained from the 2006 SWHS (G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication).

### 2007 Fishery Performance

This fishery is not creel surveyed or monitored inseason. Participation in this fishery is primarily in the winter and early spring. Lake trout harvest estimates are derived from the SWHS (Mills 1979-1980, 1981a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, In prep.; Jennings et al. 2004; 2006 a-b). Catch for this species was first estimated by SWHS in 1990. Estimates reflect a peak lake trout harvest of 3,761 fish in 1986 (Table 24). The significant decline in 1997-2006 harvests is attributed to the more restrictive bag limit (2 fish), however several years of high harvests may have negatively impacted the stock. Harvests from 1997 through 2006 stabilized at 200-500 fish. The 1997-2006 average lake trout harvest from Hidden Lake was 367 fish (Table 24).

The 2006 SWHS estimates that both total catch and harvest of lake trout in Hidden Lake was the third lowest on record (Table 24). ADF&G projects that the 2007 season's sport fishing effort and harvest should be similar to the 2006 season. The SWHS will provide data for the 2007 season in mid-2008.

## 2007 NORTH KENAI PENINSULA MANAGEMENT AREA PERSONAL USE FISHERIES

### 2008 Proposals to the Alaska Board of Fisheries Concerning North Kenai Peninsula Personal Use Dip Net Fisheries Issues

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the personal use dip net fisheries targeting sockeye salmon in the Kenai and Kasilof rivers:

> Proposal Numbers: 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, and 224.

### Kenai River Sockeye Salmon Dip Net Fishery

### Background and Historical Perspective

The *Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan* (5 AAC 77.540) was adopted at the 1981 Alaska Board of Fisheries (BOF) meeting. This plan provided for a personal use dip net fishery in the Kenai and Kasilof Rivers that targeted sockeye salmon and a personal use gillnet fishery in the marine waters at the mouth of Kasilof River. The fishery could occur on the Kenai River after an escapement of 500,000 sockeye salmon was projected. As with other personal use dip net fisheries, only Alaska residents could participate. A sport fishing license was required; no other permits were required. The daily bag and possession limits were 6 sockeye salmon that were not in addition to other marine and freshwater sport fishing limits. Legal gear was confined to a dip net. Regulations restricted the fishery in the Kenai River to the lower section of the river downstream from the Warren Ames Bridge near the City of Kenai (Figure 16).

Prior to 1987, the Kenai River personal use dip net fishery occurred only in 1982 and 1983. Harvest is unknown in 1982, and only 7,562 sockeye were taken in 1983 (Table 25). The

reasons for the low harvest were a combination of unperfected angler technique, relatively clear water, and relatively small numbers of fish present.

In 1987 the dip net fishery opened at 12 noon on July 23, it remained open for the next 13.5 days, and it closed on August 5. Total sockeye salmon escapement to the Kenai River was a record 1.6 million fish. During the peak of the fishery, dipnetting was successfully conducted 24 hours a day. A 1987 harvest of 24,086 sockeye salmon was estimated by the Statewide Harvest Survey (Mills 1988,Table 25).

At the 1988 Alaska Board of Fisheries meeting, the trigger point for the Kenai River personal use dip net fishery was raised to 700,000 sockeye salmon, the upper end of the new escapement goal.

Projected escapement exceeded 700,000 fish in 1989, so the Kenai River sockeye salmon personal use dip net fishery occurred. In December 1989, the Alaska Supreme Court's McDowell Decision ruled that all Alaska residents are subsistence users.

In 1990, there was no personal use dip net fishery because the projected Kenai River escapement was below 700,000 sockeye salmon. In December 1990, the Alaska Board of Fisheries adopted the Upper Cook Inlet Subsistence Salmon Management Plan. Under this plan subsistence fishing was allowed in most marine waters of Upper Cook Inlet normally open to commercial gillnet fishing. Set gillnet fishing was also allowed in Knik Arm, as well as dip net fishing in the mouths of the Kenai and Kasilof rivers. Permits were required to participate in these subsistence fisheries and a valid Alaska resident sport fishing license was not required. The annual bag and possession limit was 25 salmon per head of household of which no more than 5 could be Chinook salmon. In addition, a household was allowed another 10 salmon for each household member, of which no more than 1 could be a Chinook salmon.

The Cook Inlet Personal Use Dip Net Fishery Management Plan was still in place, however, this management plan specified that fisheries in the Kasilof and Kenai rivers could not occur on the same day as the subsistence dip net fishery. The escapement level that triggered the personal use dip net fishery in the Kenai River was set at 700,000 sockeye salmon in years when a subsistence dip net fishery occurred and 400,000 sockeye salmon if there was no subsistence fishery.

Escapement in 1991 was less than 700,000 sockeye salmon so the Kenai River personal use dip net fishery did not occur. Subsistence dip net fishing was open on the Kenai River on May 25 and August 3 only; all other openings in Kenai River were canceled due to legal challenges and court action. Reported sockeye salmon harvest in the Kenai River subsistence dip net fishery was 10,468 fish, with 75% of permits returned (Brannian and Fox 1996).

There were no legal challenges during the 1992 fishing season, so the subsistence dip net fishery was open for a total of 34 days, including 3 days in May, 4 days in June, and every Wednesday and Saturday in July, August, and September (Brannian and Fox 1996). Reported harvest, with 43% of the permits returned, was 16,240 sockeye salmon. The Kenai River personal use dip net fishery allowed under the Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan also took place in 1992 (Table 25). It was restricted to days when the subsistence fishery was not open. It continued to have a possession limit of 6 sockeye salmon and did not require a permit.

The Alaska State Legislature during the 1992 session passed legislation that required the Alaska Boards of Fisheries and Game (BOF/BOG) to identify nonsubsistence areas where dependence

on subsistence was not a principle characteristic of the economy, culture, and way of life. During their November 1992 meeting the BOF/BOG established the Anchorage/Mat-Su/Kenai nonsubsistence area. The BOF also rescinded the Upper Cook Inlet Subsistence Salmon Management Plan. This ended all subsistence fisheries in Upper Cook Inlet except the Tyonek subsistence fishery. The personal use dip net fishery remained in place. The escapement trigger for the personal use dip net fishery on the Kenai River was now 400,000, and once the fishery opened, fishing could be continuous. The 1993 personal use fishery opened on July 17 and closed on July 31, with an estimated harvest of 33,467 sockeye salmon (Table 25).

In October 1993, Superior Court Judge Dana Fabe (in Kenaitze versus Alaska) found unconstitutional the provision in the 1992 state subsistence law that directed the BOF/BOG to designate nonsubsistence areas. This ruling was appealed by the State of Alaska to the Alaska Supreme Court where a stay was granted on March 10, 1994. The full court vacated this stay on April 11, 1994. A special meeting of the joint Boards of Fisheries and Game was convened on April 28, 1994 by teleconference. As a result of these meetings the Upper Cook Inlet Subsistence Salmon Management Plan was readopted on April 28, 1994.

Since there was not enough time for a formal board meeting prior to the 1994 season, the BOF directed that the Commissioner of Fish and Game should exercise his emergency regulatory authority to adopt regulations for the 1994 fishery. The BOF directed that this fishery should mirror the 1992 subsistence fishery. Subsistence fishing periods were again on select Wednesdays and Saturdays from late May to the end of September. The annual bag and possession limits were again 25 salmon per head of household of which no more than 5 could be Chinook salmon. In addition a household was allowed another 10 salmon for each household member, of which no more than 1 could be a Chinook salmon. A permit was required to participate, but not a sport fishing license. Reported subsistence dip net harvest, with 48% of the permits returned, was 13,897 sockeye salmon (Brannian and Fox 1996). The personal use dip net fishery remained in place. The escapement trigger for years when a subsistence fishery occurs remained at 700,000 sockeye salmon. The trigger for years without a subsistence fishery was changed to 450,000 sockeye salmon to reflect a new minimum escapement goal. In 1994, a sonar count of 700,000 could not be projected prior to July 31 and the personal use dip net fishery did not occur despite a final sonar count in excess of 1 million.

In 1995, subsistence fisheries were scheduled to begin on May 20; however, in early May the Alaska Supreme Court overturned the October 1993 Superior Court decision. This ruling reestablished the Anchorage/Mat-Su/Kenai nonsubsistence area. The BOF convened an emergency meeting by teleconference on May 24, 1995 to close subsistence fisheries in the now nonsubsistence area. The BOF delegated authority to the Commissioner to readopt the Upper Cook Inlet Subsistence Salmon Management Plan as a personal use fishery. The 1995 dip net fishery was therefore prosecuted as a personal use fishery, having the same regulations as the 1994 subsistence fishery, and still requiring a permit. This permitted fishery was open on select Wednesdays and Saturdays from late May to the end of September. To further complicate the situation, the old personal use fishery allowed under the Cook Inlet Personal Use Salmon Dip Net Management Plan was still in place. It still had a possession limit of 6 sockeye salmon and did not require a permit. The nonpermitted personal use fishery triggered by a projected escapement count of 450,000 fish opened at 6:00 a.m. July 25. The fishery occurred daily except Wednesdays and Saturdays, when the permitted fishery occurred. The nonpermitted fishery closed July 31, with a total fishing time of 4.75 days.

The estimate of permitted Kenai River sockeye salmon personal use dip net harvest was 18,502 (Brannian and Fox 1996). This includes a known harvest of 11,771 fish from returned permits (Ruesch and Fox 1996) and an estimate of the harvest from those that had permits but did not return them. The Statewide Harvest Survey estimated total 1995 Kenai River sockeye salmon personal use harvest (both permitted and nonpermitted) to be 14,352 sockeye salmon (Table 25).

## Kenai River Personal Use Dip Net Fishery Management Objectives

This fishery is managed under provisions of the *Kenai River Late-Run Sockeye Salmon Management Plan* (5 AAC 21.360) and the *Upper Cook Inlet Personal Use Salmon Fishery Management Plan* (5 AAC 77.540). The fishery objective is to implement provisions contained in the respective management plans. The fishery primarily targets sockeye salmon.

## 2007 Inseason Management Approach

Management of this fishery is the joint responsibility of the Division of Commercial Fisheries and the Division of Sport Fish. The Division of Commercial Fisheries is responsible for operation of the Kenai River sonar counter that estimates sockeye salmon entering the river. The personal use dip net fishery opens and closes by regulation. Inseason management by the Division of Sport Fish would be required only in the event the minimum inriver escapement goal for sockeye salmon could not be projected.

By regulation, the Kenai River personal use fishery takes place annually from July 10 through July 31. This fishery is liberalized by increasing the daily hours open for fishing from 6:00 a.m. through 11:00 p.m. to twenty-four hours per day when the strength of the Kenai River sockeye salmon run is projected inseason to be greater than 2.0 million fish.

During 2007, the Kenai River personal use fishery was opened by regulation on July 10 for the daily hours of 6:00 a.m. through 11:00 p.m. Due to the run strength of the 2007 Kenai River sockeye salmon return, as indicated by the daily escapements past ADF&G's sonar station, the personal use fishery was liberalized to a 24-hour per day fishery on the evening of July 25.

## 2007 Fishery Performance

Participants in this personal use fishery are required to get a permit, and are required to return the permit to ADF&G, regardless of whether they fished. Persons who do not comply with the reporting requirement are sent reminder letters to prompt their response. Since 1996, harvest and effort in the Kenai River personal use dip net fishery has been estimated from reported harvest on returned permits. All responses prior to the second reminder letter are treated as a census of "compliant" permits. Responses from the second (and up to fourth in some years) reminder letters are considered to be a sample of the "noncompliant" permits. Estimates of mean harvest and effort from the noncompliant permits are expanded by the known total number of noncompliant permits and used to generate the total estimate of "noncompliant" harvest and effort. This estimate is then added to the sum of the harvest and effort from the compliant permits to generate the estimate of total harvest for the fishery.

The total Kenai River personal use dip net fishery sockeye salmon harvest for 2006 was approximately 127,630 fish (Table 26). Sockeye salmon harvest during 2006 was significantly below the recent 10-year (1997-2006) average harvest of 170,656 fish; however the fishery was closed by emergency order for 9 days from July 22-30, and then was reopened for one day to close on its normal regulatory date of July 31. This was due to low numbers of sockeye passing

the sonar. The fishery was subsequently reopened by emergency order for an additional 8 days from August 3-10 as a result of increasing numbers of sockeye salmon passing the sonar later in the run. The overall run timing of the sockeye in 2006 was very late and this may have attributed to the low harvest in the personal use fishery. A total of 1,034 Chinook, 2,235 coho, 11,127 pink, and 551 chum salmon were harvested in the Kenai River personal use dip net fishery during 2006 (Table 26).

ADF&G expects the 2007 harvest from the Kenai River personal use dip net fishery will exceed the 2006 harvest by as much as 100%. The fishery was open for 22 consecutive days without disruption and fishing time was increased by emergency order for the final 6 days. Large daily estimates of sockeye passage at the sonar and near normal run timing provided excellent opportunities. Final 2007 harvest estimates will be available by mid-2008 following the collection and processing of personal use permit data.

Participation during 2006 was approximately 12,685 days fished (Table 26). Participation in the 2006 Kenai River dip net personal use fishery was the lowest on record since 2000, and was influenced by the management restrictions that were implemented due to the low return of sockeye in July. The most recent 10-year (1997-2006) average for participation in the personal use fishery was 14,497 days fished (Table 26). Participation in the 2007 Kenai River personal use dip net fishery is expected to return to normal levels as there were no inseason restrictions placed on the fishery, and instead it was liberalized on July 25. Sockeye salmon run timing was near average in 2007 as well.

Department observations and reports from dipnetters indicted that success varied from poor to excellent depending upon the daily escapement of sockeye salmon into the Kenai River Actions of the commercial fishing fleet and/or the natural run timing of the salmon entering the Kenai River could each make or break a dipnetters day. During 2007, the total Kenai River sockeye salmon escapement estimate past ADF&G's sonar station was 867,572 fish. This cumulative escapement was within established inriver goals. Daily sockeye salmon escapements into the Kenai River ranged from a 2,000 to 60,260 fish per day. During the 22 days the 2007 Kenai River personal use dip net fishery was open, daily sockeye salmon escapements above 30,000 fish per day occurred on 10 days.

## 2007 KASILOF RIVER PERSONAL USE DIP NET FISHERY

### Background and Historical Perspective

In the spring of 1981, the Alaska Board of Fisheries (BOF) adopted a Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan. The BOF's intent was to provide for salmon dip net fisheries in Cook Inlet, allowing Alaska residents an opportunity to harvest sockeye salmon for their personal consumptive needs without disrupting existing fisheries. Personal use dip net fisheries did not initially open until ADF&G determined that specific escapement goals were met and/or subsistence, commercial, and other sport users have had, or will have, reasonable opportunity to harvest fish in excess of spawning requirements. In recent years, this criteria has been relaxed.

Participants in the fishery include local and regional residents from the Southcentral Alaska area. Sockeye salmon are the target species in the fishery, however small numbers of coho and pink salmon are also caught and retained. Fishing takes place from both banks of the Kasilof River as well as from small boats. The majority of the effort occurs along the north bank of the river

where there is good road access and parking spaces. Typically, catch rates are highest 2.5 hours before and after high tide; however, during the peak of large runs, sockeye salmon are harvested at virtually all tide levels.

In 1981 and 1982, harvest and angler participation in the dip net fishery were determined by creel census. Because the fishery is managed by monitoring sonar counts above the fishery, the creel survey was deemed unnecessary and it was discontinued. Harvest and estimates of angler participation were determined by the Statewide Harvest Survey through 1995 (Mills 1982-1994; Howe et al. 1995, 1996) and by returned permits in 1996 through 2004.

From 1981 through 1988, the Kasilof River dip net fishery (Figure 17) was open approximately 2-3 weeks each year from mid-July through early August. The popularity of this fishery increased annually, with record levels of both harvest and effort occurring in 1986 (Table 27). Average harvest and angler participation from 1981 through 1988 was 14,120 sockeye salmon and 7,170 days fished, respectively. Dipnetters harvested an average of 13.5% of the sockeye salmon entering the Kasilof River. From 1981 to 1988, the personal use fishery harvested 1 to 14% of the total number of sockeye salmon that entered Kasilof River and averaged 5.3% annually.

In 1989 and 1990, the minimum sonar count established by the BOF to open this fishery was not achieved or was achieved too late to provide reasonable dipnetting opportunity. Therefore, the personal use dip net fishery did not open during these years.

In 1990, the BOF established subsistence set and dip net fisheries for Upper Cook Inlet. The dip net fishery occurred in the mouths of the Kenai and Kasilof rivers. The allowable days and times subsistence dipnetting occurred was provided for by regulation. The area open to subsistence dipnetting in these rivers was identical to the area where personal use dipnetting occurs when the latter fishery is open. Permits were required for these subsistence fisheries and a valid Alaska resident sport fishing license was not required to participate. The annual bag and possession limits were 25 salmon per head of household of which no more than 5 could be Chinook salmon. In addition, a household was allowed another 10 salmon for each household member, of which no more than 1 could be a Chinook salmon. The BOF determined that subsistence and personal use dipnetting would not occur concurrently and they amended the Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan accordingly. The revised plan stated that when the personal use fishery occurs in either the Kenai or Kasilof rivers, it (personal use) will be closed at 12:01 a.m. on those days that the subsistence fishery occurs, reopening again at 12:01 a.m. the following day.

The Cook Inlet Personal Use Salmon Dip Net Fishery Management Plan was further amended as it pertained to the Kasilof River. The escapement goal, which triggers the opening of the personal use dip net fishery, was raised from the minimum goal of 150,000 to the maximum escapement goal of 250,000. However, during years when the subsistence dip net fishery did not occur, the personal use fishery would open when the minimum sockeye salmon escapement goal of 150,000 could be projected.

A subsistence fishery occurred in 1991. However, the maximum sonar count goal of 250,000 was not realized, and the personal use dip net fishery was not opened. The reported 1991 subsistence harvest, with 75% of the permits returned, was 907 sockeye salmon (Brannian and Fox 1996). Regulation of the subsistence fishery was identical in 1992. The maximum sonar count goal was not achieved in 1992, and a personal use dip net fishery in the Kasilof River

again did not occur. Reported 1992 subsistence harvest, with 43% of the permits returned, was 1,230 sockeye salmon (Brannian and Fox 1996).

During the 1992 session, the Alaska State Legislature passed legislation that required the Boards of Fisheries and Game (BOF/BOG) to identify nonsubsistence areas where dependence on subsistence was not a principle characteristic of the economy, culture, and way of life. During their November 1992 meeting, the BOF/BOG established the Anchorage/Mat-Su/Kenai non-subsistence area. The BOF also rescinded the Upper Cook Inlet Subsistence Salmon Management Plan. This ended all subsistence fisheries in Upper Cook Inlet except the Tyonek subsistence fishery. The personal use dip net fishery remained in place. The trigger point for the opening of the personal use fishery reverted to the minimum projected sonar count of 150,000. The final sonar count was 152,230. The minimum sonar count (150,000) could not be projected with assurance until August l. By this late date there were insufficient sockeye salmon entering the river to prosecute a successful dip net fishery, and as a result, the personal use fishery did not occur for the fifth consecutive year.

In October 1993, Superior Court Judge Dana Fabe (in Kenaitze v. Alaska) found the provision in the 1992 state subsistence law that directed the BOF/BOG to designate nonsubsistence areas was unconstitutional. This ruling was appealed by the State of Alaska to the Alaska Supreme Court where a stay was granted on March 10, 1994. The full court vacated this stay on April 11, 1994. A special meeting of the joint Boards of Fisheries and Game was convened on April 28, 1994 by teleconference. As a result of these meetings, the Upper Cook Inlet Subsistence Salmon Management Plan was readopted on April 28, 1994.

Since there was not enough time for a formal board meeting prior to the 1994 season, the BOF directed that the Commissioner of Fish and Game should exercise his emergency regulatory authority to adopt regulations for the 1994 fishery. The BOF directed that this fishery should mirror the 1992 subsistence fishery. Subsistence fishing periods were again on select Wednesdays and Saturdays from late May to the end of September. The annual bag and possession limits were again 25 salmon per head of household of which no more than five could be Chinook salmon. In addition, a household was allowed another 10 salmon for each household member, of which no more than one could be a Chinook salmon. A permit was required to participate, but not a sport fishing license. Reported 1994 subsistence dip net harvest, with 48% of the permits returned, was 2,735 sockeye salmon (Brannian and Fox 1996).

The personal use dip net fishery remained in place; however ADF&G adopted a trigger sonar count of 150,000 for the 1994 fishery. This was apparently an administrative error; the intent was to use the same 250,000 trigger as in 1992. This notwithstanding, a sonar count of 150,000 was the trigger which opened the Kasilof River personal use dip net fishery in 1994. A sonar count of 150,000 was assured the morning of July 22; the personal use dip net fishery was opened at 12:00 noon and continued through August 5. As this fishery could not open on days subsistence dip netting occurred, the fishery was restricted to July 22, 24, 25, 26, 28, 29, and 31 and August 1, 2, 4, and 5. Total fishing time was 10.5 days in 1994 (Table 27).

In 1995, subsistence fisheries were scheduled to begin on May 20; however, in early May the Alaska Supreme Court overturned the October 1993 Superior Court decision. This ruling reestablished the Anchorage/Mat-Su/Kenai nonsubsistence area. The BOF convened an emergency meeting by teleconference on May 24, 1995 to close subsistence fisheries in the now nonsubsistence area. The BOF delegated authority to the Commissioner of Fish and Game to

readopt the Upper Cook Inlet Subsistence Salmon Management Plan as a personal use fishery. The 1995 dip net fishery was therefore prosecuted as a personal use fishery, having the same regulations as the 1994 subsistence fishery, and still requiring a permit. This permitted fishery was open on select Wednesdays and Saturdays from late May to the end of September. To further complicate the situation, the old personal use fishery allowed under the Cook Inlet Personal Use Salmon Dip Net Management Plan was still in place. It still had a possession limit of 6 sockeye salmon and did not require a permit. The nonpermitted personal use fishery triggered by a projected escapement count of 150,000 opened at 6:00 p.m. July 17. The 1995 non permitted personal use dip net fishery occurred daily except Wednesdays and Saturdays, when the permitted fishery occurred. The nonpermitted fishery closed July 31, with a total fishing time in 1995 of 10.25 days (Table 27).

The estimate of 1995 permitted Kasilof River sockeye salmon personal use dip net harvest was 6,371 (Brannian and Fox 1996). This includes a known harvest of 4,572 from returned permits (Brannian and Fox 1996) and an estimate of the harvest from those who had permits but did not return them. The Statewide Harvest Survey estimated total 1995 Kasilof River sockeye salmon personal use harvest (both permitted and nonpermitted) to be 4,160 fish (Howe et al. 1996, Table 27).

The permitting system for the personal use dip netting fishery was developed and initiated in 1996. Since then, one permit is issued for all four Upper Cook Inlet personal use salmon fisheries (Kenai River dip net, Kasilof River dip net, Kasilof River gillnet, and Fish Creek dip net). At the 1996 BOF meetings, a 27 day fishing season was established which opened by regulation on Ju1y 10 through August 5 for 24-hours per day. The regulations adopted by the BOF established a personal use dip net fishery that was independent of the abundance of returning salmon and was not tied to the fisheries management plans for other user groups. The estimate of 1996 Kasilof River sockeye salmon personal use dip net harvest was 11,197 (Table 27; Reimer and Sigurdsson 2004). This included a known harvest from 13,452 returned permits and an estimate of the harvest from those who had permits but did not return them.

Regulations governing the Kasilof River personal use dip net fishery from 1996 to 2001 remained the same. Between 1996 and 2001 dipnetter participation in the fishery fluctuated somewhat but averaged 2,571 days fished. The 1999-2001 average sockeye salmon harvest from this fishery was 27,460 fish. The average total dip net harvest for other salmon species during this period was 103 Chinook, 535 coho, 357 pink, and 36 chum salmon.

New regulations were adopted by the BOF for the 2002 Kasilof River personal use dip net fishery which extended the fishing season up to 44 days per year. Beginning in 2002, the new season dates for this fishery were from June 25 through August 7. The 2002 salmon harvest for the Kasilof River personal use dip net fishery was 46,769 sockeye, 106 Chinook, 1,197 coho, 1,862 pink, and 139 chum salmon (Table 28). This includes a known harvest from 14,284 returned permits and an estimate of the harvest from those who had permits but did not return them. During 2002, dipnetter participation in the fishery was 4,020 days fished.

During 2003, an estimated 43,870 sockeye, 57 Chinook, 592 coho, 286 pink, and 30 chum salmon were harvested in the Kasilof River personal use dip net fishery (Table 28). This includes a known harvest from 15,726 returned permits and an estimate of the harvest from those who had permits but did not return them.

A personal use gillnet fishery also occurs in June at the mouth of Kasilof River, targeting sockeye salmon. The Kasilof River personal use gillnet fishery is monitored inseason by the

Division of Commercial Fisheries and is discussed in the annual management report (Fox and Shields 2001). Final estimates of harvest and effort since 1996 have been made by expanding known returned permits to include permits not returned (Reimer and Sigurdsson 2004).

## Kasilof River Personal Use Dip Net Fishery Management Objectives

Regulation and management of this fishery are governed by the *Upper Cook Inlet Personal Use Salmon Fishery Management Plan* (5 AAC 77.540). The fishery objective is to implement the provisions of the BOF-adopted management plan.

## 2007 Inseason Management Approach

Management of this fishery is the joint responsibility of the Division of Commercial Fisheries Division and the Division of Sport Fish. The Division of Commercial Fisheries is responsible for operation of the Kasilof River sonar counter which enumerates sockeye salmon entering the river. The personal use dip net fishery opens and closes by regulation. Inseason management by the Division of Sport Fish would be required only in the unlikely event the minimum sonar count and biological escapement goal could not be projected and achievement of these goals required restrictions to the dip net fishery or if the projected run strength exceeded the upper goal range. In 2007, the forecasted return of Kasilof River sockeye salmon was in excess of 1.2 million fish, the highest forecast on record.

Participants in this personal use fishery are required to get a permit, and are required to return the permit to Fish and Game, regardless of whether they fished. Persons who do not comply with the reporting requirement are sent reminder letters to prompt their response. Since 1996, harvest and effort in the Kenai River personal use dip net and gillnet fishery have been estimated from reported harvest on returned permits. All responses prior to the second reminder letter are treated as a census of "compliant" permits. Responses from the second (and up to fourth in some years) reminder letters are considered to be a sample of the "noncompliant" permits. Estimates of mean harvest and effort from the noncompliant permits are expanded by the known total number of noncompliant permits and used to generate the total estimate of "noncompliant" harvest and effort. This estimate is then added to the sum of the harvest and effort from the compliant permits to generate the estimate of total harvest for the fishery.

The 2007 sockeye salmon return to Kasilof River resulted in an estimated escapement of 366,866 salmon past ADF&G's sonar station. On the occasion that the upper goal range of the BEG of 150,000 – 250,000 sockeye salmon is projected to be exceeded, ADF&G staff has the tools to liberalize the personal use fishery. On July 23, the Kasilof River personal use dip net fishery area was expanded for shoreline and boat based dipnetting. The shoreline based dipnetting area was expanded to the Sterling Highway Bridge. This is the third year in a row that the Kasilof dip net fishery area was expanded this far upriver. The first time was done as an experiment during the initial development of this fishery. The area opened to dipnetting from boats was expanded upriver to river mile 3 below Trujillo's landing. Both liberalizations were enacted in attempts to reduce sockeye salmon escapement into Kasilof River. The large 2007 sockeye salmon run to the Kasilof River was expected. Liberalization of the sport fishery for sockeye salmon in the Kasilof River was also enacted on July 23 in an attempt to reduce the escapement as well. Although final estimates for the 2007 sockeye run are not available, preliminary results indicate a total run of about 1.6 million.

### 2007 and Recent Fishery Performance

Harvest and effort during 2006 were estimated from returned permits. Final estimates for 2007 will not be available until mid-2008. The total Kasilof River dip net harvest of sockeye salmon during 2006 was approximately 56,144 fish (Table 27). Sockeye salmon harvest during 2006 was the highest in the history of the fishery. Participation during 2006 was approximately 5,763 days fished which was the highest participation in the last ten years (Table 28). ADF&G expects harvest and effort levels in the 2007 Kasilof River dip net personal use fishery should be similar to 2006. Due to the normal escapements and run timing of sockeye salmon into the Kasilof River during 2007 and similar inseason management actions to liberalize the fishery, ADF&G projects that the total personal use fishery harvest will remain stable.

The 2007 Kasilof River personal use fisheries produced good opportunities to harvest sockeye salmon periodically throughout the season depending upon daily passage rates of sockeye salmon into the river. During commercial fishery closures, personal use dip net harvests significantly increased and the inverse results were also experienced. In response to the excessive sockeye salmon escapement into the Kasilof River during 2007, aggressive commercial fishing management practices were initiated to reduce sockeye salmon escapement. One of these practices was to conduct a terminal harvest fishery that allowed commercial fishing nets up to the mouth of the river. During these terminal fishery periods, personal use dip net harvests were drastically reduced. Final 2007 harvest numbers will be available in mid-2008 following the collection and processing of returned personal use permits.

## 2007 NORTH KENAI PENINSULA MANAGMEMENT AREA NORTHERN PIKE RECREATIONAL FISHERY

### 2008 Proposals to the Alaska Board of Fisheries Concerning Northern Pike in the North Kenai Peninsula Management Area Sport Fishery Issues

The following proposals published in "The Alaska Board of Fisheries 2007/2008 Proposed Changes in the Cook Inlet, Kodiak, and Chignik Areas Finfish Regulations; King and Tanner Regulations (Statewide Except Southeast/Yakutat); and Supplemental Issues" booklet (ADF&G 2007b) will likely have some impact on the sport fisheries targeting northern pike in the North Kenai Peninsula Management Area:

Proposal Numbers: 250, 251, and 252.

### Background and Historical Perspective

Northern pike are not indigenous to the Kenai Peninsula. This species was illegally introduced into Derks Lake, tributary to Soldotna Creek, in the mid-1970s. From this initial introduction they spread rapidly through the Soldotna Creek drainage, including East and West Mackey Lakes, Soldotna Creek, and Soldotna (Sevena) Lake. They are also present in Stormy Lake in the Swanson River drainage.

Pike are a predator species, and reports from anglers indicated that as the number of pike in the drainage increased, numbers of rainbow trout and Dolly Varden declined. Soldotna Lake, prior to the introduction of pike, was reputed to support one of the most viable rainbow trout populations on the Kenai Peninsula. Soldotna Lake's reputation as a trout producer declined steadily in the 1980s as pike became the dominant species.

There was considerable public and department concern that pike would become established in the mainstem Kenai River, negatively impacting this river's salmon and trout populations. Although small numbers of pike have been caught in the Kenai River mainstem (Table 29), there is no evidence to date that pike are reproducing in the mainstem Kenai River, and negative impacts to the river's salmon and trout cannot be measured directly. Pike have, however, used the Kenai River as a migratory corridor. Since they are present in the drainage and have negatively impacted salmonid production in the Soldotna Creek drainage, pike have negatively impacted the Kenai River drainage's capacity for salmonid production.

In spring 1986 a weir was established on the east fork of Moose River in conjunction with a rainbow trout study. One pike was known to have passed through the structure. Information from the Statewide Harvest Survey also indicates that anglers have harvested small numbers of pike in the lakes (Afonasi, Imeri, Watson, Equmen, Peterson, Kelly, and Hikers lakes) of this drainage. Harvests of pike are too small to be estimated for specific lakes (Table 29).

Northern pike were also illegally introduced into three unnamed lakes about 6 miles south of Soldotna in the early to mid-1980s. These lakes are accessed via Tote Road and it is assumed local residents introduced the pike. These lakes are fortunately landlocked.

Although there is some local interest in pike fishing, this species supports a minor if not insignificant sport fishery. The best pike fishing is in Stormy, Mackeys, and Soldotna lakes. The Mackeys and Soldotna lakes are almost entirely bordered by private land and access is limited, whereas Stormy Lake is surrounded by public lands within the boundaries of the Captain Cook State Park and Kenai National Wildlife Refuge. A small outlet stream drains from the southwest corner of Stormy Lake into the lower tidally influenced area of the Swanson River, a major Kenai Peninsula coho salmon producer. Pike have been present in Stormy Lake for about 3-decades as indicated from anecdotal information. The largest pike sampled by ADF&G and reported by the sport fishing public have been harvested from Stormy Lake. Reports of pike harvest elsewhere in the Swanson River drainage have not been confirmed by ADF&G. Some fishing by local residents, including spear fishing during the winter months, occurs throughout the year. Pike harvested in the east fork of the Moose River are probably caught incidentally to rainbow trout and Dolly Varden. Total pike harvest on the Kenai Peninsula averages about 287 fish annually. Two of the Northern Kenai Peninsula's stocked lakes, Scout and Arc lakes, are no longer stocked due to the illegal introduction of pike into these waters.

## NORTH KENAI PENINSULA MANAGEMENT AREA NORTHERN PIKE FISHERY OBJECTIVES

This fishery is not specifically addressed in any management plan adopted by the Alaska Board of Fisheries. Northern pike were illegally introduced on the Kenai Peninsula. ADF&G-adopted objective for this fishery is to provide the opportunity for angler participation to continue at present or increased levels.

## 2007 INSEASON MANAGEMENT APPROACH

There has been no inseason management in the history of this fishery. The fishery is managed through existing regulations. Regulations are liberal because northern pike were illegally introduced into Kenai Peninsula waters and compete with resident trout and salmon species. Currently there is no bag limit or closed season for northern pike in the NKPMA.

Beginning in 2003, ADF&G began to aggressively target and remove northern pike from lakes within the NKPMA (Begich and McKinley 2005). The invasive species removal project (basically netting northern pike) took place from May 11 to June 16. During the first half of this project, 1,500 northern pike were captured with variable mesh gillnets and removed from four lakes of the Soldotna Creek drainage. Gillnets were fished for about 10,000 hours among Derks and Sevena lakes, and East and West Mackey lakes. Mean fork lengths of captured northern pike ranged from 10.4 inches at East Mackey up to 16.6 inches at Sevena Lake. No other adult fish species were captured in these lakes.

Reduction of northern pike by gillnetting resumed in these lakes on September 21, 2004 and continued until October 22 when the lakes became ice-covered. During this second half of the project, a total of 1,176 northern pike were removed from the Derks, Sevena, and East and West Mackey lakes. Subsequent sampling of these lakes from 2005 to 2007 indicated that the northern pike population has been reduced, temporarily. Interestingly, as the numbers of pike removed from lakes in the Soldotna Creek drainage increased, overtime bycatch of non-pike species increased. The bycatch included: rainbow trout, Dolly Varden, juvenile coho salmon, and stickleback.

### 2007 Recent Fishery Performance

The NKPMA 2006 harvest of an estimated 55 northern pike was the lowest since 1997, and was significantly lower than the most recent 10-year (1996-2005) average of 567 fish. The sudden decrease in northern pike harvests is likely due to the increased eradication efforts of northern pike in area lakes, particularly at Soldotna Lake and to some extent the Mackey Lakes. According to the Statewide Harvest Survey, the 55 pike harvested in 2006 were from Stormy Lake (Table 29).

During 2007, ADF&G did receive two reports of anglers encountering northern pike in the Swanson River. ADF&G could not verify either of the reports. ADF&G projects that the total 2007 harvest of northern pike within the NKPMA will be equal to or slightly greater than the 2006 season. This reduced level in harvest is expected as the direct result of the thousands of northern pike that have been removed from the NKPMA by ADF&G's invasive species removal project. Future efforts to remove invasive species from the NKPMA will continue and strategies to contain their expansion are being developed.

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# TABLES AND FIGURES

**Table 1**.—Angler-days of effort expended by recreational anglers fishing Kenai Peninsula Management Area waters, 1977-2006.

| | Kenai River | | Other Kenai Peninsula | | Kenai Peninsula Dipnet [a] | | Kenai Area | | Alaska |
|---|---|---|---|---|---|---|---|---|---|
| Year | Effort | %NKPMA | Effort | %NKPMA | Effort | %NKPMA | Total Effort | % of Alaska | Total |
| 1977 | 122,138 | 34 | 233,626 | 66 | ND | ND | 355,764 | 30 | 1,198,486 |
| 1978 | 164,264 | 37 | 274,129 | 63 | ND | ND | 438,393 | 34 | 1,286,063 |
| 1979 | 178,485 | 39 | 282,943 | 61 | ND | ND | 461,428 | 34 | 1,364,739 |
| 1980 | 171,803 | 38 | 277,573 | 62 | ND | ND | 449,376 | 30 | 1,488,962 |
| 1981 | 178,716 | 41 | 253,238 | 58 | 5,370 | 1 | 437,324 | 31 | 1,420,772 |
| 1982 | 231,948 | 47 | 263,516 | 53 | 2,580 | 1 | 498,044 | 31 | 1,623,090 |
| 1983 | 229,228 | 43 | 282,428 | 53 | 9,576 | 2 | 521,232 | 30 | 1,732,528 |
| 1984 | 270,422 | 46 | 296,641 | 51 | 7,227 | 1 | 574,290 | 31 | 1,866,837 |
| 1985 | 322,230 | 49 | 319,601 | 48 | 10,647 | 2 | 652,478 | 34 | 1,943,069 |
| 1986 | 335,051 | 46 | 364,681 | 50 | 15,856 | 2 | 715,588 | 35 | 2,071,412 |
| 1987 | 289,165 | 37 | 450,768 | 58 | 32,473 | 4 | 772,406 | 36 | 2,152,886 |
| 1988 | 374,259 | 45 | 408,226 | 49 | 37,304 | 4 | 819,789 | 35 | 2,311,291 |
| 1989 | 376,902 | 49 | 341,981 | 45 | 33,054 | 4 | 751,937 | 33 | 2,264,079 |
| 1990 | 342,662 | 43 | 443,175 | 56 | 2,184 | 0 | 788,021 | 32 | 2,463,284 |
| 1991 | 323,368 | 41 | 434,795 | 55 | 12,040 | 2 | 770,203 | 31 | 2,456,328 |
| 1992 | 332,573 | 40 | 467,185 | 57 | 12,131 | 1 | 811,889 | 32 | 2,540,374 |
| 1993 | 324,120 | 39 | 479,614 | 58 | 16,525 | 2 | 820,259 | 32 | 2,559,408 |
| 1994 | 340,904 | 35 | 595,784 | 62 | 14,785 | 2 | 951,473 | 35 | 2,719,911 |
| 1995 | 377,710 | 41 | 505,047 | 55 | 17,124 | 2 | 899,881 | 32 | 2,787,670 |
| 1996 [b] | 265,986 | 65 | 123,015 | 30 | 11,803 | 3 | 400,804 | 20 | 2,006,528 |
| 1997 [b] | 247,898 | 63 | 125,333 | 32 | 12,114 | 3 | 385,345 | 19 | 2,079,514 |
| 1998 [b] | 216,650 | 62 | 114,792 | 33 | 14,223 | 4 | 345,665 | 19 | 1,856,976 |
| 1999 [b] | 307,446 | 64 | 150,640 | 31 | 17,349 | 4 | 475,435 | 19 | 2,499,152 |
| 2000 [b] | 358,569 | 64 | 187,464 | 33 | 14,976 | 3 | 561,009 | 21 | 2,627,805 |
| 2001 [b] | 298,817 | 53 | 131,932 | 30 | 18,154 | 4 | 448,903 | 20 | 2,261,941 |
| 2002 [b] | 312,785 | 65 | 149,832 | 31 | 18,860 | 4 | 481,477 | 21 | 2,259,091 |
| 2003 [b] | 320,747 | 67 | 120,715 | 25 | 19,137 | 4 | 460,599 | 21 | 2,219,398 |
| 2004 [b] | 375,370 | 71 | 129,461 | 25 | 22,945 | 4 | 527,776 | 21 | 2,473,961 |
| 2005 [b] | 388,677 | 72 | 122,370 | 23 | 25,477 | 5 | 536,524 | 22 | 2,463,929 |
| 2006 [b] | 329,122 | 59 | 206,314 | 37 | 18,448 | 3 | 553,884 | 24 | 2,298,092 |
| Avg. (1997-2006) | 315,608 | 64 | 143,885 | 30 | 18,168 | 4 | 477,662 | 21 | 2,303,986 |
| Avg. (1981-2006) | | | | | 16,245 | 3 | | | |
| Avg. (1977-2006) | 290,267 | 50 | 284,561 | 46 | | | 588,907 | 28 | 2,109,919 |

*Note:* Angler-Day = the time spent fishing by one person for any part of a day; Effort = participation (number of days fished); NKPMA = Northern Kenai Peninsula Management Area; ND = no data collected.

[a] 1981-2006 from Statewide Harvest Surveys (Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). 1996-1997 total reported harvest from returned permits. 1998, 1999 to 2006 expanded harvest from returned permits (Reimer and Sigurdsson 2004). No data collected prior to 1981.

[b] Data from 1995-2006 does not include Lower Cook Inlet.

**Table 2.–**Angler-days of sport fishing effort for the Kenai River by section, 1977-2006.

| | Sport Fishing Effort | | | | | |
|---|---|---|---|---|---|---|
| Year | Cook Inlet to Soldotna Bridge[a] | Soldotna Bridge[a] to Moose River | Moose River to Skilak Outlet | Skilak Inlet to Kenai Lake | Kenai River Reach Not Specified | Kenai River Total |
| 1977 | ND | ND | ND | ND | ND | 122,138 |
| 1978 | ND | ND | ND | ND | ND | 164,264 |
| 1979 | ND | ND | ND | ND | ND | 178,485 |
| 1980 | ND | ND | ND | ND | ND | 171,803 |
| 1981 | 91,763 | 35,877 | 33,701 | 17,375 | ND | 178,716 |
| 1982 | 119,164 | 49,372 | 39,170 | 24,242 | ND | 231,948 |
| 1983 | 109,067 | 52,266 | 41,442 | 26,453 | ND | 229,228 |
| 1984 | 150,824 | 42,644 | 40,976 | 35,978 | ND | 270,422 |
| 1985 | 163,690 | 66,100 | 55,904 | 36,536 | ND | 322,230 |
| 1986 | 181,035 | 63,876 | 51,171 | 38,969 | ND | 335,051 |
| 1987 | 141,203 | 66,807 | 41,128 | 40,027 | ND | 289,165 |
| 1988 | 203,728 | 79,727 | 55,334 | 35,470 | ND | 374,259 |
| 1989 | 198,697 | 93,508 | 53,135 | 31,562 | ND | 376,902 |
| 1990 | 169,818 | 82,331 | 43,401 | 47,112 | ND | 342,662 |
| 1991 | 151,592 | 82,552 | 45,067 | 44,157 | ND | 323,368 |
| 1992 | 150,249 | 81,378 | 49,774 | 51,172 | ND | 332,573 |
| 1993 | 162,171 | 70,353 | 38,583 | 53,013 | ND | 324,120 |
| 1994 | 170,944 | 71,440 | 39,222 | 59,298 | ND | 340,904 |
| 1995 | 206,127 | 81,280 | 43,432 | 46,871 | ND | 377,710 |
| 1996 | 131,751 | 61,059 | 32,465 | 40,711 | ND | 265,986 |
| 1997 | 120,873 | 58,618 | 32,645 | 35,762 | ND | 247,898 |
| 1998 | 95,378 | 56,342 | 36,218 | 28,712 | ND | 216,650 |
| 1999 | 157,493 | 69,331 | 41,573 | 39,049 | ND | 307,446 |
| 2000 | 178,460 | 92,056 | 41,911 | 46,142 | ND | 358,569 |
| 2001 | 153,356 | 75,249 | 34,918 | 35,294 | ND | 298,817 |
| 2002 | 142,492 | 78,165 | 33,228 | 52,937 | 5,963 [b] | 312,785 |
| 2003 | 143,144 | 90,072 | 35,804 | 40,815 | 10,912 [b] | 320,747 |
| 2004 | 166,202 | 100,180 | 51,188 | 49,814 | 7,986 [b] | 375,370 |
| 2005 | 168,570 | 111,806 | 40,903 | 51,892 | 15,506 [b] | 388,677 |
| 2006 | 151,623 | 91,912 | 35,667 | 40,624 | 9,296 [b] | 329,122 |
| Avg. (2002-2006) | | | | | 9,933 | |
| Avg. (1997-2006) | 147,759 | 82,373 | 38,406 | 42,104 | | 315,608 |
| Avg. (1981-2006) | 153,054 | 73,242 | 41,845 | 40,384 | | 310,436 |
| Avg. (1977-2006) | | | | | | 290,267 |

*Note:* Angler-Day = the time spent fishing by one person for any part of a day; Effort = participation (number of days fished); ND = no data collected

[a] The Soldotna Bridge (as referred to in Statewide Harvest Surveys (SWHS)) and the Sterling Highway bridge (as identified in the Sport Fishing Regulations Summary for Southcentral Alaska (ADF&G 2007a)) are one and the same.

[b] Adopted by SWHS beginning in 2002.

**Table 3.–**Kenai River sport fish harvest by species, 1977-2006.

| Year | Sport Fish Harvest | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chinook salmon | Sockeye salmon | Coho salmon | Pink salmon | Chum salmon | Rainbow trout | Dolly Varden | Arctic grayling | Smelt [a] | Total |
| 1977 | 7,585 | 23,196 | 9,537 | 163 | 0 | 4,438 | 7,423 | 187 | 56,550 | 109,079 |
| 1978 | 7,130 | 33,619 | 10,823 | 26,579 | 0 | 9,272 | 17,140 | 90 | 15,832 | 120,485 |
| 1979 | 8,843 | 16,887 | 15,276 | 127 | 0 | 14,644 | 34,687 | 127 | 10,690 | 101,281 |
| 1980 | 4,942 | 25,468 | 26,838 | 18,580 | 0 | 9,807 | 26,794 | 17 | 150,554 | 263,000 |
| 1981 | 9,634 | 19,721 | 22,324 | 86 | 0 | 18,685 | 34,862 | 65 | 41,126 | 146,503 |
| 1982 | 10,418 | 50,103 | 39,415 | 25,572 | 0 | 12,673 | 16,484 | 188 | 49,355 | 204,208 |
| 1983 | 15,316 | 71,267 | 22,678 | 1,825 | 0 | 13,658 | 9,556 | 126 | 85,126 | 219,552 |
| 1984 | 12,321 | 15,702 | 59,644 | 28,560 | 0 | 15,687 | 31,407 | 51 | 47,455 | 210,827 |
| 1985 | 13,965 | 57,213 | 44,535 | 1,306 | 186 | 14,981 | 26,235 | 104 | 26,460 | 184,985 |
| 1986 | 18,119 | 72,398 | 60,110 | 19,924 | 563 | 2,425 | 5,775 | 120 | 33,124 | 212,558 |
| 1987 | 24,978 | 240,819 | 33,210 | 941 | 144 | 2,185 | 7,630 | 156 | 53,773 | 363,836 |
| 1988 | 32,415 | 152,751 | 48,694 | 15,777 | 849 | 2,133 | 10,977 | 692 | 18,223 | 282,511 |
| 1989 | 17,160 | 277,225 | 55,259 | 1,421 | 520 | 1,917 | 10,064 | 151 | 31,398 | 395,115 |
| 1990 | 7,684 | 120,788 | 60,325 | 27,185 | 312 | 3,535 | 11,982 | 51 | 36,563 | 268,425 |
| 1991 | 9,174 | 161,602 | 76,156 | 2,416 | 0 | 3,319 | 14,504 | 0 | 6,334 | 273,505 |
| 1992 | 9,753 | 242,492 | 52,310 | 10,029 | 0 | 1,977 | 14,462 | 0 | 14,971 | 345,994 |
| 1993 | 30,312 | 137,180 | 50,538 | 1,003 | 0 | 2,574 | 12,698 | 0 | 6,619 | 240,924 |
| 1994 | 27,708 | 93,616 | 86,711 | 8,701 | 0 | 1,576 | 8,486 | 0 | 3,391 | 230,189 |
| 1995 | 23,168 | 125,425 | 46,183 | 991 | 0 | 2,150 | 9,523 | 0 | 987 | 208,427 |
| 1996 | 15,740 | 186,291 | 42,293 | 15,406 | 464 | 1,560 | 7,484 | 123 | 7,366 | 276,727 |
| 1997 | 15,177 | 177,133 | 16,164 | 1,371 | 154 | 1,910 | 6,957 | 131 | 8,874 | 227,871 |
| 1998 | 7,450 | 164,536 | 26,967 | 8,926 | 79 | 2,015 | 6,079 | 25 | 8,175 | 224,252 |
| 1999 | 17,145 | 200,574 | 31,637 | 1,895 | 333 | 3,784 | 7,568 | 64 | 4,942 | 267,942 |
| 2000 | 16,613 | 230,983 | 48,519 | 19,081 | 350 | 3,459 | 7,427 | 93 | 29,286 | 355,811 |
| 2001 | 15,189 | 200,762 | 49,782 | 2,069 | 498 | 2,422 | 6,528 | 76 | 23,012 | 300,338 |
| 2002 | 10,353 | 225,917 | 59,650 | 22,995 | 959 | 6,019 | 5,781 | 146 | 20,036 | 351,856 |
| 2003 | 17,904 | 285,925 | 46,622 | 2,847 | 94 | 2,278 | 6,113 | 42 | 11,841 | 373,666 |
| 2004 | 18,283 | 294,038 | 65,915 | 20,313 | 123 | 3,311 | 5,818 | 277 | 41,085 | 449,163 |
| 2005 | 21,934 | 294,287 | 50,411 | 5,112 | 52 | 2,517 | 4,316 | 62 | 9,206 | 387,897 |
| 2006 | 19,668 | 173,425 | 37,639 | 12,448 | 52 | 2,499 | 3,218 | 10 | 2,307 | 251,266 |
| Avg. (2004-2006) | 19,962 | 253,917 | 51,322 | 12,624 | 76 | 2,776 | 4,451 | 116 | 17,533 | 362,775 |
| Avg. (1997-2006) | 15,972 | 224,758 | 43,331 | 9,706 | 269 | 3,021 | 5,981 | 93 | 15,876 | 319,006 |
| Avg. (1977-2006) | 15,536 | 145,711 | 43,206 | 10,122 | 191 | 5,647 | 12,599 | 106 | 28,489 | 261,606 |

*Note:* Harvest = fish kept (number of fish)

[a] Smelt statistics in the Statewide Harvest Survey are reported by family: Osmeridae. The smelt species harvested in the Northern Kenai Peninsula Management Area are eulachon *Thaleichthys pacificus*; longfin smelt *Spirinchus thaleichthys* are also present in the fall, but this smaller species is not harvested (R.N. Begich, Area Management Biologist, ADF&G, Soldotna, personal communication).

**Table 4.–**Angler-days of sport fishing effort for other Northern Kenai Peninsula Area drainages by fishery, 1979-2006.

| | Sport Fish Effort | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Russian River | Kasilof River | Swanson River | Quartz Creek | Hidden Lake | Skilak Lake | Tustemena Lake | Other [a] | Total |
| 1979 | 58,133 | ND | ND | ND | 5,974 | ND | ND | 118,826 | 182,933 |
| 1980 | 78,983 | ND | ND | ND | 5,783 | ND | ND | 103,742 | 188,508 |
| 1981 | 54,642 | 8,311 | ND | ND | 4,761 | ND | ND | 92,092 | 159,806 |
| 1982 | 70,372 | 13,238 | ND | ND | 6,278 | ND | ND | 82,595 | 172,483 |
| 1983 | 35,018 | 16,675 | 2,124 | 691 | 6,761 | 422 | 253 | 83,918 | 145,862 |
| 1984 | 55,861 | 25,697 | 5,671 [b] | 3,413 | 4,835 | 67 | 351 | 73,111 | 169,006 |
| 1985 | 80,054 | 24,103 | 4,058 [b] | 451 | 3,676 | 121 | 1,734 | 83,161 | 197,358 |
| 1986 | 70,729 | 36,115 | 7,599 [b] | 4,146 | 6,254 | 413 | 291 | 95,974 | 221,521 |
| 1987 | 91,600 | 42,703 | 7,353 [b] | 5,361 | 12,532 | 4,129 | 1,576 | 98,989 | 264,243 |
| 1988 | 76,180 | 43,965 | 10,368 | 3,965 | 4,820 | 3,838 | 1,419 | 80,417 | 224,972 |
| 1989 | 53,598 | 39,318 | 5,484 | 4,893 | 1,152 | 2,810 | 923 | 70,086 | 178,264 |
| 1990 | 68,861 | 40,437 | 6,091 | 5,655 | 4,188 | 2,817 | 2,200 | 94,304 | 224,553 |
| 1991 | 76,433 | 46,208 | 5,830 | 5,354 | 4,426 | 4,120 | 1,596 | 86,612 | 230,579 |
| 1992 | 67,443 | 49,774 | 4,897 | 7,906 | 4,172 | 3,820 | 1,600 | 102,131 | 241,743 |
| 1993 | 61,018 | 57,127 | 5,690 | 9,152 | 5,030 | 3,289 | 1,055 | 104,955 | 247,316 |
| 1994 | 65,996 | 50,821 | 5,039 | 7,241 | 3,014 | 1,805 | 1,587 | 115,769 | 251,272 |
| 1995 | 58,090 | 50,012 | 4,637 | 5,179 | 4,443 | 2,957 | 1,332 | 99,936 | 226,586 |
| 1996 [c] | 50,122 | 33,585 | 3,907 | 3,018 | 2,305 | 1,780 | 910 | 25,141 | 120,768 |
| 1997 [c] | 46,914 | 32,287 | 3,495 | 3,401 | 2,575 | 2,346 | 1,699 | 31,428 | 124,145 |
| 1998 [c] | 47,942 | 26,487 | 3,422 | 3,166 | 1,576 | 1,645 | 985 | 28,679 | 113,902 |
| 1999 [c] | 64,536 | 40,263 | 3,606 | 4,708 | 2,017 | 1,182 | 599 | 31,655 | 148,566 |
| 2000 [c] | 69,864 | 46,654 | 5,839 | 2,423 | 1,804 | 2,072 | 1,368 | 55,633 | 185,657 |
| 2001 [c] | 55,972 | 39,034 | 4,060 | 3,105 | 1,604 | 1,701 | 731 | 25,505 | 131,712 |
| 2002 [c] | 68,263 | 35,198 | 4,249 | 4,245 | 1,412 | 1,668 | 871 | 33,926 | 149,832 |
| 2003 [c] | 50,448 | 30,840 | 3,807 | 4,357 | 1,761 | 2,068 | 802 | 26,632 | 120,715 |
| 2004 [c] | 60,784 | 29,889 | 2,878 | 6,589 | 1,902 | 2,460 | 972 | 23,987 | 129,461 |
| 2005 [c] | 55,801 | 30,436 | 3,552 | 6,106 | 1,548 | 594 | 684 | 23,649 | 122,370 |
| 2006 [c] | 70,804 | 26,175 | 3,533 | 5,582 | 1,975 | 1,152 | 455 | 96,638 | 206,314 |
| Avg. (1997-2006) | 59,133 | 33,726 | 3,844 | 4,368 | 1,817 | 1,689 | 917 | 37,773 | 143,267 |
| Avg. (1983-2006) | | | 4,883 | 4,588 | | 2,053 | 1,083 | | |
| Avg. (1981-2006) | | 35,206 | | | | | | | |
| Avg. (1979-2006) | 63,016 | | | | 3,878 | | | 71,053 | 181,445 |

*Note:* Angler-Day = the time spent fishing by one person for any part of a day; Effort = participation (number of days fished); ND = no data collected

[a] Includes all other streams, lakes, rivers and ponds not mentioned. These number in the hundreds.

[b] Includes Swanson River canoe route.

[c] Data from 1996-2006 does not include Lower Kenai Peninsula Management Area.

**Table 5.–**Sport fish harvest from other Northern Kenai Peninsula Management Area drainages, 1977-2006.

| | Sport Fish Harvest | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | Chinook salmon | Sockeye salmon | Coho salmon | Pink salmon | Chum salmon | Rainbow trout | Dolly Varden | Arctic grayling | Smelt [a] | Total |
| 1977 | 8,110 | 51,174 | 9,509 | 10,637 | 162 | 18,663 | 26,960 | 1,400 | 29,561 | 156,176 |
| 1978 | 10,225 | 68,689 | 9,856 | 12,273 | 390 | 16,373 | 38,192 | 2,197 | 39,418 | 197,613 |
| 1979 | 9,496 | 40,321 | 10,484 | 8,654 | 127 | 19,717 | 51,041 | 1,391 | 12,135 | 153,366 |
| 1980 | 3,887 | 59,375 | 8,925 | 9,729 | 215 | 22,655 | 36,892 | 2,109 | 23,958 | 167,745 |
| 1981 | 7,819 | 36,082 | 10,206 | 9,947 | 173 | 23,456 | 40,325 | 1,826 | 85,968 | 215,802 |
| 1982 | 10,406 | 49,964 | 10,028 | 6,302 | 180 | 18,459 | 26,657 | 2,015 | 5,851 | 129,862 |
| 1983 | 11,108 | 32,726 | 9,004 | 6,063 | 923 | 18,729 | 45,513 | 1,455 | 101,439 | 226,960 |
| 1984 | 12,468 | 65,027 | 11,696 | 7,244 | 211 | 13,240 | 23,357 | 998 | 1,348 | 135,589 |
| 1985 | 11,197 | 74,781 | 10,723 | 7,223 | 260 | 14,322 | 19,279 | 1,248 | 1,400 | 140,433 |
| 1986 | 13,958 | 72,195 | 11,735 | 4,466 | 118 | 14,498 | 19,863 | 1,758 | 3,446 | 142,037 |
| 1987 | 13,747 | 186,222 | 18,676 | 4,272 | 216 | 8,310 | 14,395 | 850 | 93 | 246,781 |
| 1988 | 21,167 | 89,388 | 20,918 | 11,203 | 671 | 8,180 | 12,530 | 581 | 62 | 164,700 |
| 1989 | 14,527 | 77,132 | 29,583 | 9,100 | 709 | 5,876 | 12,013 | 982 | 48 | 149,970 |
| 1990 | 17,048 | 64,505 | 17,433 | 7,679 | 372 | 11,346 | 15,874 | 862 | 2,359 | 137,478 |
| 1991 | 19,962 | 107,839 | 25,645 | 5,150 | 308 | 9,222 | 12,990 | 1,472 | 565 | 183,153 |
| 1992 | 26,163 | 68,675 | 20,634 | 10,074 | 284 | 14,379 | 15,293 | 775 | 5,344 | 161,621 |
| 1993 | 42,974 | 62,865 | 32,097 | 6,426 | 736 | 12,078 | 16,658 | 1,268 | 1,541 | 176,643 |
| 1994 | 35,306 | 81,431 | 33,442 | 5,928 | 273 | 12,485 | 13,542 | 1,636 | 4,012 | 188,055 |
| 1995 | 32,265 | 45,128 | 27,692 | 5,955 | 291 | 12,203 | 10,550 | 1,863 | 2,514 | 138,461 |
| 1996 [b] | 6,428 | 62,418 | 12,813 | 4,053 | 188 | 8,331 | 4,385 | 778 | 0 | 99,394 |
| 1997 [b] | 6,959 | 56,049 | 8,550 | 2,409 | 244 | 14,247 | 7,581 | 1,178 | 1,621 | 98,838 |
| 1998 [b] | 4,921 | 73,301 | 10,505 | 8,180 | 321 | 11,060 | 4,020 | 838 | 2,552 | 115,698 |
| 1999 [b] | 8,710 | 74,101 | 10,587 | 1,104 | 246 | 14,494 | 3,615 | 1,040 | 352 | 114,249 |
| 2000 [b] | 10,173 | 81,548 | 12,373 | 6,787 | 1,376 | 21,168 | 6,764 | 1,780 | 9 | 141,978 |
| 2001 [b] | 8,926 | 60,863 | 11,783 | 2,675 | 158 | 7,802 | 3,025 | 854 | 11 | 96,097 |
| 2002 [b] | 5,302 | 92,858 | 15,040 | 6,488 | 150 | 14,093 | 3,174 | 982 | 0 | 138,087 |
| 2003 [b] | 4,294 | 60,795 | 14,946 | 2,459 | 145 | 8,225 | 2,890 | 1,141 | 304 | 95,199 |
| 2004 [b] | 4,424 | 66,084 | 15,028 | 4,193 | 209 | 5,360 | 4,163 | 874 | 0 | 100,335 |
| 2005 [b] | 4,689 | 62,443 | 10,473 | 1,190 | 108 | 5,228 | 1,798 | 739 | 0 | 86,668 |
| 2006 [b] | 3,391 | 171,624 | 18,528 | 5,700 | 483 | 5,174 | 1,588 | 387 | 0 | 206,875 |
| Avg. (1997-2006) | 6,179 | 79,967 | 12,781 | 4,119 | 344 | 10,685 | 3,862 | 981 | 485 | 119,402 |
| Avg. (1977-2006) | 13,002 | 73,187 | 15,630 | 6,452 | 342 | 12,979 | 16,498 | 1,243 | 10,864 | 150,195 |

*Note:* "Other" Northern Kenai Peninsula Management Area drainages include: Russian R, Kasilof R, Swanson R, Quartz Ck, Hidden Lk, Skilak Lk, Tustemena Lk, and other (see Table 4); Harvest = fish kept (number of fish)

[a] Smelt statistics in the Statewide Harvest Survey are reported by family: Osmeridae. The smelt species harvested in the Northern Kenai Peninsula Management Area are eulachon *Thaleichthys pacificus*; longfin smelt *Spirinchus thaleichthys* are also present in the fall, but this smaller species is not harvested (R.N. Begich, Area Management Biologist, ADF&G, Soldotna, personal communication).

[b] Data from 1996-2006 des not include Lower Kenai Peninsula Management Area

**Table 6.–**Anglers-days of effort for Kenai River and Kasilof River personal use dip net fisheries, 1982-2006.

| Year | Personal Use Dip Net Fishery Effort [a] | | |
|---|---|---|---|
| | Kenai River | Kasilof River | Total |
| 1982 | Unknown | 2,580 | 2,580 |
| 1983 | 3,203 | 4,417 | 7,620 |
| 1984 | [b] | 5,956 | 5,956 |
| 1985 | [b] | 9,260 | 9,260 |
| 1986 | [b] | 13,929 | 13,929 |
| 1987 | 22,547 | 8,910 | 31,457 |
| 1988 | 29,013 | 6,930 | 35,943 |
| 1989 | 31,312 | [b] | 31,312 |
| 1990 | [b] | [b] | [b] |
| 1991 | [b] | [b] | [b] |
| 1992 | 10,371 | [b] | 10,371 |
| 1993 | 14,896 | [b] | 14,896 |
| 1994 | [b] | 2,361 | 2,361 |
| 1995 | 11,122 | 2,845 | 13,967 |
| 1996 | 10,503 | 1,300 | 11,803 |
| 1997 | 11,023 | 1,091 | 12,114 |
| 1998 | 10,802 | 3,421 | 14,223 |
| 1999 | 13,738 | 3,611 | 17,349 |
| 2000 | 12,354 | 2,622 | 14,976 |
| 2001 | 14,722 | 3,382 | 18,104 |
| 2002 | 14,840 | 4,020 | 18,860 |
| 2003 | 15,263 | 3,874 | 19,137 |
| 2004 | 18,513 | 4,432 | 22,945 |
| 2005 | 20,977 | 4,500 | 25,477 |
| 2006 | 12,685 | 5,763 | 18,448 |
| Avg. (2004-2006) | 17,392 | 4,898 | 22,290 |
| Avg. (1997-2006) | 14,492 | 3,672 | 18,163 |
| Avg. (1982-2006) | 15,438 | 4,760 | 16,221 |

*Note:* Angler-Day = the time spent fishing by one person for any part of a day; Effort = participation (number of days fished).

[a] Source: 1982-1995 from Statewide Harvest Surveys (Mills 1983-1994; Howe et al. 1995-1996). 1996-1997 total reported harvest from returned permits. 1998-2006 from expanding the know return to include permits not returned.

[b] No personal use fishery.

**Table 7.–**Kenai Peninsula personal use dip net harvest by species, 1983-2006.

| Year | Personal Use Dip Net Harvest [a] | | | | | |
|---|---|---|---|---|---|---|
| | Chinook salmon | Coho salmon | Sockeye salmon | Pink salmon | Chum salmon | Total |
| 1983 | 0 | 0 | 24,152 | 0 | 0 | 24,152 |
| 1984 | 0 | 0 | 14,565 | 0 | 0 | 14,565 |
| 1985 | 0 | 248 | 19,282 | 62 | 0 | 19,592 |
| 1986 | 0 | 1,422 | 40,489 | 1,315 | 0 | 43,226 |
| 1987 | 362 | 2,862 | 43,771 | 471 | 181 | 47,647 |
| 1988 | 0 | 5,275 | 22,337 | 2,019 | 345 | 29,976 |
| 1989 | 0 | 3,804 | 54,392 | 1,212 | 240 | 59,648 |
| 1990 | 0 | 0 | 5,835 | 68 | 178 | 6,081 |
| 1991 | 0 | 450 | 65,082 | 33 | 0 | 65,565 |
| 1992 | 0 | 1,409 | 15,657 | 1,126 | 106 | 18,298 |
| 1993 | 0 | 1,474 | 37,727 | 538 | 0 | 39,739 |
| 1994 | 0 | 3,120 | 31,133 | 1,882 | 78 | 36,213 |
| 1995 | 0 | 1,839 | 33,269 | 526 | 27 | 35,661 |
| 1996 | 345 | 2,266 | 114,018 | 2,507 | 192 | 119,328 |
| 1997 | 399 | 649 | 124,356 | 638 | 77 | 126,119 |
| 1998 | 388 | 1,742 | 149,008 | 1,642 | 159 | 152,939 |
| 1999 | 615 | 1,295 | 186,680 | 1,930 | 154 | 190,674 |
| 2000 | 544 | 2,453 | 122,139 | 2,298 | 227 | 127,661 |
| 2001 | 776 | 2,321 | 188,378 | 1,633 | 178 | 193,286 |
| 2002 | 712 | 2,918 | 226,797 | 7,524 | 690 | 238,641 |
| 2003 | 1,073 | 1,924 | 267,450 | 1,933 | 279 | 272,659 |
| 2004 | 836 | 3,329 | 311,146 | 2,499 | 477 | 318,287 |
| 2005 | 1,013 | 3,050 | 338,647 | 2,464 | 423 | 345,597 |
| 2006 | 1,089 | 3,292 | 183,774 | 12,119 | 656 | 200,930 |
| Avg. (2004-2006) | 979 | 3,224 | 277,856 | 5,694 | 519 | 288,271 |
| Avg. (1997-2006) | 745 | 2,297 | 209,838 | 3,468 | 332 | 216,679 |
| Avg. (1983-2006) | 340 | 1,964 | 109,170 | 1,935 | 194 | 113,604 |

*Note:* Harvest = fish kept (number of fish)

[a] Source: 1983-1995 from Statewide Harvest Surveys (Mills 1983-1994; Howe et al. 1995-1996). 1996-1997 from total reported harvest from returned permits. 1998-2006 from expanding the known return to include permits not returned.

**Table 8.–**Estimated harvest, spawning escapement, and return for early-run Kenai River Chinook salmon, 1986-2007.

| Year | Deep Creek Marine Sport Fish Harvest | Commercial Gillnet Harvest | | Kenaitze Educational Fishery Harvest | Inriver Return [a] | Kenai River Sport Fish Harvest [b] | Hook-and-Release Mortality | Spawning Escapement | Total Return |
|---|---|---|---|---|---|---|---|---|---|
| | | Eastside Setnet | Driftnet | | | | | | |
| 1986 | Unknown | Closed | Closed | N/A | 27,080 | 8,156 | 242 | 18,682 | 27,080 |
| 1987 | Unknown | Closed | Closed | N/A | 25,643 | 13,557 | 306 | 11,780 | 25,643 |
| 1988 | Unknown | Closed | Closed | N/A | 20,880 | 15,209 | 340 | 5,331 | 20,880 |
| 1989 | Unknown | Closed | Closed | 73 | 17,992 | 8,394 | 149 | 9,449 | 18,065 |
| 1990 | Unknown | Closed | Closed | 40 | 10,679 | 1,807 | 378 | 8,494 | 10,719 |
| 1991 | Unknown | Closed | Closed | 2 | 10,931 | 1,945 | 152 | 8,834 | 10,933 |
| 1992 | Unknown | Closed | Closed | 73 | 10,087 | 2,241 | 236 | 7,610 | 10,160 |
| 1993 | Unknown | Closed | Closed | 118 | 19,921 | 9,342 | 286 | 10,293 | 20,039 |
| 1994 | Unknown | Closed | Closed | 56 | 18,403 | 8,171 | 285 | 9,947 | 18,459 |
| 1995 | Unknown | Closed | Closed | 37 | 21,884 | 10,217 | 357 | 11,310 | 21,921 |
| 1996 | Unknown | Closed | Closed | 104 | 23,505 | 6,623 | 287 | 16,595 | 23,609 |
| 1997 | Unknown | Closed | Closed | 122 | 14,963 | 6,437 | 350 | 8,176 | 15,085 |
| 1998 | Unknown | Closed | Closed | 131 | 9,184 | 1,170 | 254 | 7,760 | 9,315 |
| 1999 | Unknown | Closed | Closed | 114 | 25,666 | 8,129 | 261 | 17,276 | 25,780 |
| 2000 | Unknown | Closed | Closed | 124 | 12,479 | 1,818 | 185 | 10,476 | 12,603 |
| 2001 | Unknown | Closed | Closed | 198 | 16,676 | 2,397 | 205 | 14,074 | 16,874 |
| 2002 | Unknown | Closed | Closed | 48 | 7,162 | 899 | 78 | 6,185 | 7,210 |
| 2003 | Unknown | Closed | Closed | 126 | 13,325 | 2,839 | 389 | 10,097 | 13,451 |
| 2004 | Unknown | Closed | Closed | 72 | 15,498 | 3,383 | 261 | 11,854 | 15,570 |
| 2005 | Unknown | Closed | Closed | 76 | 20,450 | 3,810 | 253 | 16,387 | 20,526 |
| 2006 | Unknown | Closed | Closed | 65 | 23,326 | 4,693 | 205 | 18,428 | 23,391 |
| 2007 | Unknown | Closed | Closed | 16 [c] | 15,904 [c] | [d] | [d] | [d] | [d] |

[a] *Source:* 1986-1998 (Hammarstrom and Timmons 2001a), 1999-2006 (Reimer et al. 2002; Walker et al. 2003; Jennings et al. 2007, *In prep.*; Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). Includes creel survey estimates for the area from Cook Inlet to the Soldotna bridge and estimates from the Statewide Harvest Survey (SWHS) for Soldotna bridge to the outlet of Kenai Lake.

[b] Preliminary data.

[c] Information from the 2007 SWHS is needed to complete estimates; it will be available in mid-2008.

**Table 9.–**Estimated harvest, spawning escapement, and return for late-run Kenai River Chinook salmon, 1986-2007.

| Year | Deep Marine Sport Fish Harvest [a] | Commercial Gillnet Harvest: Eastside Setnet [b] | Commercial Gillnet Harvest: Driftnet [c] | Commercial Gillnet Harvest: Personal Use [d] | Kenaitze Educational Fishery Harvest | Subsistence Harvest | Personal Use [f] Harvest | Inriver Return [g] | Kenai Sport Fish Harvest [b] | Hook-and-Release Mortality [b] | Spawning Escapement | Total Return |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1986 | 630 | 19,824 | 1,834 | ND | ND | ND | ND | 57,563 | 9,872 | 316 | 47,375 | 79,837 |
| 1987 | 1,218 | 21,150 | 4,552 | ND | ND | ND | 235 | 48,123 | 13,100 | 123 | 34,900 | 74,480 |
| 1988 | 1,487 | 12,859 | 2,237 | ND | ND | ND | 0 | 52,008 | 19,695 | 176 | 32,137 | 68,582 |
| 1989 | 1,368 | 10,926 | 0 [c] | 4 | ND | ND | 0 | 29,035 | 9,691 | 88 | 19,256 | 41,344 |
| 1990 | 1,605 | 4,139 | 621 | 91 | ND | ND | ND | 33,474 | 6,897 | 69 | 26,508 | 39,943 |
| 1991 | 1,705 | 4,893 | 246 | 130 | ND | 413 | ND | 34,614 | 7,903 | 16 | 26,695 | 41,869 |
| 1992 | 2,115 | 11,841 | 615 | 50 | ND | 621 | 0 | 30,314 | 7,556 | 234 | 22,524 | 44,142 |
| 1993 | 2,834 | 13,977 | 765 | 110 | ND | ND | 0 | 51,991 | 17,775 | 478 | 33,738 | 69,709 |
| 1994 | 1,869 | 15,563 | 464 | 13 | 1 | 797 | ND | 53,474 | 17,837 | 572 | 35,065 | 72,093 |
| 1995 | 2,069 | 12,032 | 594 | 36 | 3 | 753 | 772 | 44,336 | 12,609 | 472 | 31,255 | 59,642 |
| 1996 | 2,038 | 11,521 | 389 | 43 | 1 | ND | 295 | 39,356 [h] | 8,112 | 337 | 30,907 | 53,619 |
| 1997 | 2,931 | 11,281 | 627 | 44 | 20 | ND | 364 | 39,622 [h] | 12,755 | 570 | 26,297 | 54,688 |
| 1998 | 1,784 | 5,039 | 335 | 48 | 2 | ND | 254 | 34,878 | 7,515 | 595 | 26,768 | 42,306 |
| 1999 | 1,004 | 9,389 | 575 | 73 | 4 | ND | 488 | 48,069 | 13,595 | 682 | 34,962 | 60,773 |
| 2000 | 1,052 | 3,651 | 270 | 33 | 6 | ND | 410 | 44,517 | 15,222 | 499 | 29,627 | 50,770 |
| 2001 | 920 | 5,904 | 619 | 105 | 8 | ND | 638 | 33,916 | 16,480 | 825 | 17,947 | 43,446 |
| 2002 | 427 | 9,468 | 415 | 14 | 6 | ND | 606 | 41,807 | 12,607 | 665 | 30,464 | 54,668 |
| 2003 | 200 | 14,772 | 1,240 | 48 | 11 | ND | 1,016 | 41,659 | 16,943 | 1,803 | 23,736 | 59,759 |
| 2004 | 1,660 | 21,683 | 1,526 | 255 | 10 | ND | 792 | 56,205 | 17,374 | 1,019 | 40,198 | 84,195 |
| 2005 | 1,040 | 21,472 [i] | 1,839 [i] | 867 | 11 | ND | 997 | 43,240 | 18,214 | 1,267 | 26,046 | 70,783 |
| 2006 | 938 | 8,696 [i] | 1,051 [i] | 47 | 11 | ND | 1,034 | 37,743 | 15,811 | 830 | 24,423 | 52,795 |
| 2007 [j] | n/a | 11,996 [i] | 865 [i] | n/a | 6 [i] | ND | n/a | 42,979 | n/a [k] | n/a [k] | n/a [k] | n/a |

*Note:* ND = no data collected.

[a] Source: (Hammarstrom and Timmons 2001b). Sport harvest includes creel survey estimates for the area from Cook Inlet to the Soldotna bridge and estimates from the Statewide Harvest Survey for Soldotna bridge to the outlet of Kenai Lake.

[b] Some harvest is below sonar and not counted against escapement.

[c] Total number of Chinook salmon harvested in fishery. No commercial drift net fishery included in 1989 due to *Exxon Valdez* oil spill.

[d] Eastside set net personal use.

[e] Source: (Brannian and Fox 1996)

[f] Source: 1986-1993 (Brannian and Fox 1996), 1995 (Ruesch and Fox 1996), 1996-2000 estimated from returned permits.

[g] Sonar counts for 1996 and 1997 were 49,755 and 49,933, respectively (Burwen and Bosch 1998; Bosch and Burwen 1999). Escapement and total return estimates are calculated using radio telemetry tagging estimates shown here (Hammarstrom and Timmons 2001b).

[h] Harvest estimate does not include Kasilof River terminal fishery.

[i] Preliminary numbers. n/a = data not available at this time

j Information from the 2007 SWHS is needed to complete estimates; it will be available in mid-2008.

**Table 10.–**Guided versus unguided angler harvest, effort, and success rate, estimated by onsite creel survey downstream of the Soldotna bridge, late-run Kenai River Chinook salmon fishery, 1981-2007.

| | Angler Harvest | | | | | | | | Angler Effort | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Guided | | | Non-Guided | | | Total | | Guided (Hours) | | Non-guided (Hours) | | Total (Hours) |
| Year | Number | % | HPUE | Number | % | HPUE | Number | HPUE | Number | % | Number | % | Number |
| 1981 | 2,162 | 52.1 | 0.071 | 1,988 | 47.9 | 0.030 | 4,150 | 0.043 | 30,351 | 31.4 | 66,309 | 68.6 | 96,660 |
| 1982 | 2,257 | 52.0 | 0.065 | 2,083 | 48.0 | 0.022 | 4,340 | 0.034 | 34,897 | 27.3 | 92,931 | 72.7 | 127,828 |
| 1983 | 4,919 | 59.1 | 0.090 | 3,405 | 40.9 | 0.031 | 8,324 | 0.050 | 54,756 | 33.2 | 110,172 | 66.8 | 164,928 |
| 1984 | 2,614 | 40.2 | 0.062 | 3,888 | 59.8 | 0.019 | 6,502 | 0.026 | 42,062 | 16.8 | 208,309 | 83.2 | 250,371 |
| 1985 | 2,705 | 38.1 | 0.067 | 4,395 | 61.9 | 0.026 | 7,100 | 0.034 | 40,398 | 19.1 | 171,109 | 80.9 | 211,507 |
| 1986 | 3,198 | 39.7 | 0.067 | 4,855 | 60.3 | 0.030 | 8,053 | 0.039 | 47,379 | 22.9 | 159,943 | 77.1 | 207,322 |
| 1987 | 5,194 | 48.2 | 0.075 | 5,573 | 51.8 | 0.029 | 10,767 | 0.041 | 69,622 | 26.4 | 193,630 | 73.6 | 263,252 |
| 1988 | 8,393 | 51.1 | 0.095 | 8,042 | 48.9 | 0.034 | 16,435 | 0.051 | 88,331 | 27.3 | 235,043 | 72.7 | 323,374 |
| 1989 | 4,727 | 59.0 | 0.055 | 3,281 | 41.0 | 0.018 | 8,008 | 0.029 | 86,507 | 31.7 | 186,382 | 68.3 | 272,889 |
| 1990 | 3,544 | 61.0 | 0.042 [b] | 2,269 | 39.0 | 0.014 [b] | 5,813 | 0.024 [b] | 85,477 | 34.7 | 161,071 | 65.3 | 246,548 |
| 1991 | 3,864 | 56.4 | 0.047 | 2,985 | 43.6 | 0.020 | 6,849 | 0.030 | 82,706 | 36.0 | 147,293 | 64.0 | 229,999 |
| 1992 | 4,176 | 62.5 | 0.064 [b] | 2,504 | 37.5 | 0.024 [b] | 6,680 | 0.040 [b] | 75,324 | 40.2 | 112,091 | 59.8 | 187,415 |
| 1993 | 7,866 | 51.5 | 0.085 | 7,413 | 48.5 | 0.037 | 15,279 | 0.052 | 92,213 | 31.4 | 201,695 | 68.6 | 293,908 |
| 1994 | 6,628 | 46.1 | 0.060 | 7,760 | 53.9 | 0.032 | 14,388 | 0.041 | 110,049 | 31.0 | 244,729 | 69.0 | 354,778 |
| 1995 | 5,211 | 51.5 | 0.042 | 4,914 | 48.5 | 0.025 | 10,125 | 0.031 | 123,585 | 38.1 | 200,397 | 61.9 | 323,982 |
| 1996 | 3,853 | 64.4 | 0.035 | 2,131 | 35.6 | 0.017 | 5,984 | 0.025 | 110,057 | 46.1 | 128,438 | 53.9 | 238,495 |
| 1997 | 5,856 | 56.7 | 0.046 | 4,480 | 43.3 | 0.033 | 10,336 | 0.039 | 126,416 | 47.9 | 137,226 | 52.1 | 263,642 |
| 1998 | 3,575 | 59.8 | 0.041 [b] | 2,406 | 40.2 | 0.028 [b] | 5,981 | 0.034 [b] | 98,872 | 52.4 | 89,854 | 47.6 | 188,726 |
| 1999 | 7,605 | 63.2 | 0.064 | 4,422 | 36.8 | 0.033 | 12,027 | 0.048 | 118,196 | 46.8 | 134,264 | 53.2 | 252,460 |
| 2000 | 6,585 | 54.6 | 0.058 | 5,480 | 45.4 | 0.041 | 12,065 | 0.049 | 114,362 | 46.0 | 134,020 | 54.0 | 248,382 |
| 2001 | 8,240 | 60.0 | 0.075 | 5,496 | 40.0 | 0.043 | 13,736 | 0.058 | 109,238 | 46.2 | 127,395 | 53.8 | 236,633 |
| 2002 | 6,537 | 56.9 | 0.071 | 4,945 | 43.1 | 0.049 | 11,482 | 0.060 | 91,972 | 47.7 | 100,808 | 52.3 | 192,780 |
| 2003 | 7,637 | 55.2 | 0.083 | 6,200 | 44.8 | 0.054 | 13,837 | 0.067 | 91,768 | 44.2 | 115,688 | 55.8 | 207,456 |
| 2004 | 9,491 | 65.5 | 0.086 | 5,003 | 34.5 | 0.039 | 14,494 | 0.061 | 110,690 | 46.4 | 127,725 | 53.6 | 238,415 |
| 2005 | 8,419 | 55.0 | 0.080 | 6,893 | 45.0 | 0.055 | 15,312 | 0.066 | 105,550 | 45.7 | 125,235 | 54.3 | 230,785 |
| 2006 | 7,295 | 55.3 | 0.062 | 5,895 | 44.7 | 0.042 | 13,190 | 0.051 | 117,210 | 45.5 | 140,490 | 54.5 | 257,700 |
| 2007 | 6,405 | 69.2 | 0.060 | 2,853 | 30.8 | 0.025 | 9,258 | 0.042 | 106,644 | 48.6 | 112,575 | 51.4 | 219,219 |
| Avg. (1997-2006) | 7,059 | 59.2 | 0.066 | 4,916 | 40.8 | 0.040 | 11,974 | 0.052 | 108,265 | 47.1 | 122,298 | 52.9 | 230,563 |
| Avg. (1981-2006) | 5,517 | 55.0 | 0.065 | 4,502 | 45.0 | 0.031 | 10,019 | 0.043 | 87,579 | 37.5 | 146,845 | 62.5 | 234,424 |

*Note:* Harvest = fish kept (number of fish); Effort = participation (number of hours fished).

[a] Harvest per angler per hour.

[b] Harvest per angler per hour does not include periods open only to retention of trophy (length greater than 52 inches) Chinook salmon.

**Table 11.–**Kasilof River personal use and subsistence gillnet harvest of Chinook salmon, 1984-2006.

| Year | Personal Use and Subsistence Gillnet Harvest |
|---|---|
| 1984 | 165 |
| 1985 | 203 |
| 1986 | 168 |
| 1987 | 184 |
| 1988 | 118 |
| 1989 | 186 |
| 1990 | 133 |
| 1991 | 34 |
| 1992 | No Fishery |
| 1993 | 47 |
| 1994 | 54 |
| 1995 | 63 |
| 1996 | 46 |
| 1997 | 65 |
| 1998 | 126 |
| 1999 | 442 |
| 2000 | 514 |
| 2001 | 174 |
| 2002 | 192 |
| 2003 | 400 |
| 2004 | 163 |
| 2005 | 87 |
| 2006 | 287 |
| Avg. (1997-2006) | 245 |
| Avg. (1984-2006) | 175 |

*Note:* Harvest = fish kept (number of fish).

*Sources:* 1984-1998 (Ruesch and Fox 1999, Appendix A15), 1995 (Ruesch and Fox 1996, Table 15), 1994 (Brannian and Fox 1996, Table 7), 1996-2006 summaries of returned permits, expanded to include harvest of permits not returned.

**Table 12.–**Estimated harvest, spawning escapement, and return for early-run Kasilof River/Crooked Creek Chinook salmon, 1996-2007.

| | Sport Fish Harvest[a] | | | Return to the weir[b] | | | Spawning Escapement[b] | | | Total Return | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Total | Natural | Hatchery | Total | Natural | Hatchery | Total | Natural | Hatchery | Total | Natural | Hatchery |
| 1996 | 5,295 | ND | ND | 2,224 | ND | ND | 764 | ND | ND | 7,519 | ND | ND |
| 1997 | 5,627 | ND | ND | ND [c] | ND | ND | ND | ND | ND | ND | ND | ND |
| 1998 | 4,202 | ND | ND | ND [c] | ND | ND | ND | ND | ND | ND | ND | ND |
| 1999 | 7,597 | ND | ND | 2,358 | 1,918 | 440 | 1,963 | 1,557 | 406 | 9,955 | ND | ND |
| 2000 | 8,815 | ND | ND | 1,416 | 1,183 | 233 | 1,074 | 896 | 178 | 10,231 | ND | ND |
| 2001 | 7,488 | ND | ND | 2,584 | 2,122 | 462 | 2,316 | 1,898 | 418 | 10,072 | ND | ND |
| 2002 | 4,791 | 0 [d] | 4,791 | 3,303 | 2,506 | 797 | 2,674 | 1,906 | 768 | 8,094 | 2,506 | 5,588 |
| 2003 | 3,090 | 0 [d] | 3,078 | 4,127 | 2,976 | 1,151 | 3,597 | 2,554 | 1,043 | 7,217 | 2,976 | 4,229 |
| 2004 | 2,421 [e] | 0 [d] | 2,421 | 4,873 | 2,641 | 2,232 | 4,356 | 2,196 | 2,160 | 7,294 | 2,641 | 4,653 |
| 2005 | 2,624 [e] | 576 | 2,048 | 3,162 | 2,107 | 1,055 | 2,927 | 1,903 | 1,024 | 5,786 | 2,683 | 3,103 |
| 2006 | 2,461 [e] | 1,055 | 1,406 | 2,645 | 1,589 | 1,056 | 2,568 | 1,516 | 1,052 | 5,106 | 2,644 | 2,462 |
| 2007 | 2,497 [e] | 1,072 | 1,425 | 1,523 | 1,038 | 485 | 1,447 | 964 | 483 | 4,020 | 2,110 | 1,910 |
| Avg. (2005-2006) | | 816 | | | | | | | | | | |
| Avg. (2002-2006) | 3,077 | | 2,749 | | | | | | | 6,699 | 2,690 | 4,007 |
| Avg. (1999-2006) | | | | 3,059 | 2,130 | 928 | 2,684 | 1,803 | 881 | 7,969 | | |
| Avg. (1996-2006) | 4,946 | | | 2,966 | | | 2,471 | | | 7,919 | | |

*Note:* ND = no data collected.

[a] Data from Statewide Harvest Surveys (Howe et al. 1996-1999; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication).

[b] Excludes age-0.1 fish 1999-2007.

[c] Weir not operational.

[d] Retention of wild Chinook salmon prohibited.

[e] Numbers taken from inseason creel survey.

**Table 13.–**Late-run Kasilof River Chinook salmon sport fish harvest, 1996-2006.

| Year | Chinook Salmon Sport Fish Harvest[a] |
|---|---|
| 1996 | 833 |
| 1997 | 1,101 |
| 1998 | 637 |
| 1999 | 658 |
| 2000 | 1,086 |
| 2001 | 1,378 |
| 2002 | 451 |
| 2003 | 1,144 |
| 2004 | 1,038 |
| 2005 | 1,052 |
| 2006 | 883 |
| Avg. (2002-2006) | 914 |
| Avg. (1996-2006) | 933 |

*Source:* Data from Statewide Harvest Surveys (SWHS, Howe et al. 1996-1999; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication).

**Table 14.–**Angler effort, harvest rate, harvest, and spawning escapement for Russian River early-run sockeye salmon, 1965-2007.

| | Angler | | | | | |
|---|---|---|---|---|---|---|
| | Effort | | Harvest/ | | Spawning | Local |
| Year | Days | Hours | Hour | Harvest | Escapement | Return [a] |
| 1965 | 7,750 | 37,710 | 0.266 | 10,030 | 21,514 | 31,544 |
| 1966 | 11,970 | 63,080 | 0.237 | 14,950 | 16,658 | 31,608 |
| 1967 | 11,460 | 62,960 | 0.115 | 7,240 | 13,710 | 20,950 |
| 1968 | 11,780 | 66,540 | 0.104 | 6,920 | 9,192 | 16,112 |
| 1969 | 12,290 | 61,790 | 0.095 | 5,870 | 5,000 | 10,870 |
| 1970 | 9,700 | 48,730 | 0.118 | 5,750 | 5,451 | 11,201 |
| 1971 | 6,250 | 33,060 | 0.085 | 2,810 | 2,654 | 5,464 |
| 1972 | 12,340 | 52,500 | 0.096 | 5,040 | 9,273 | 14,313 |
| 1973 | 15,220 | 70,950 | 0.095 | 6,740 | 13,120 | 19,860 |
| 1974 | 11,090 | 61,330 | 0.105 | 6,440 | 13,164 | 19,604 |
| 1975 | 5,210 | 20,590 | 0.068 | 1,400 | 5,645 | 7,045 |
| 1976 | 8,930 | 28,910 | 0.117 | 3,380 | 14,736 | 18,116 |
| 1977 | 38,200 | 138,580 | 0.147 | 20,400 | 16,061 | 36,461 |
| 1978 | 51,910 | 196,590 | 0.192 | 37,720 | 34,240 | 71,960 |
| 1979 | 25,670 | 96,300 | 0.087 | 8,400 | 19,749 | 28,149 |
| 1980 | 31,430 | 130,820 | 0.208 | 27,220 | 28,624 | 55,844 |
| 1981 | 24,780 | 103,130 | 0.104 | 10,720 | 21,142 | 31,862 |
| 1982 | 39,000 | 163,140 | 0.211 | 34,500 | 56,106 | 90,606 |
| 1983 | 18,560 | 78,550 | 0.106 | 8,360 | 21,272 | 29,632 |
| 1984 | 29,230 | 144,680 | 0.248 | 35,880 | 28,908 | 64,788 |
| 1985 | 16,140 | 75,000 | 0.164 | 12,300 | 30,605 | 42,905 |
| 1986 | 29,850 | 126,720 | 0.277 | 35,100 | 36,338 | 71,438 |
| 1987 | 80,360 | 319,820 | 0.482 | 154,200 | 61,513 | 215,713 |
| 1988 | 46,600 | 186,390 | 0.294 | 54,780 | 50,406 | 105,186 |
| 1989 | 20,800 | 79,660 | 0.142 | 11,290 | 15,338 [b] | 26,628 |
| 1990 | 44,740 | 178,970 | 0.169 | 30,215 | 26,716 [c] | 56,931 |
| 1991 | 64,651 | 255,854 | 0.256 | 65,390 | 32,389 [d] | 97,779 |
| 1992 | 37,484 | 143,937 | 0.212 | 30,512 | 37,117 | 67,629 |
| 1993 | 34,602 | 134,949 | 0.276 | 37,261 | 39,857 | 77,118 |
| 1994 | 42,422 | 178,173 | 0.275 | 48,923 | 44,872 | 93,795 |
| 1995 | 31,019 | 124,076 | 0.190 | 23,572 | 28,603 | 52,175 |
| 1996 | 51,710 | 225,457 | 0.334 | 75,203 | 52,905 | 128,108 |
| 1997 | ND | ND | ND | 36,788 | 36,280 | 73,068 |
| 1998 | ND | ND | ND | 42,711 | 34,143 | 76,854 |
| 1999 | ND | ND | ND | 34,283 | 36,607 | 70,890 |
| 2000 | ND | ND | ND | 40,732 | 32,736 | 73,468 |
| 2001 | ND | ND | ND | 35,400 | 78,255 | 113,655 |
| 2002 | ND | ND | ND | 52,139 | 85,943 | 138,082 |
| 2003 | ND | ND | ND | 22,986 | 23,650 | 46,636 |
| 2004 | ND | ND | ND | 32,727 | 56,582 | 89,309 |
| 2005 | ND | ND | ND | 37,139 | 52,903 | 90,042 |
| 2006 | ND | ND | ND | 51,167 | 80,524 | 131,691 |
| 2007 | ND | ND | ND | [e] | 27,298 | - |
| Avg. (1997-2006) | | | | 38,610 | 51,760 | 90,370 |
| Avg. (1965-1996) | 27,600 | 115,280 | 0.184 | | | |
| Avg. (1965-2006) | | | | 29,160 | 31,680 | 60,840 |

Note: ND = no data collected

"-" = value can't be calculated until 2007 harvest data becomes available

[a] Escapement below and above weir plus harvest.

[b] Includes 60 fish used to test brood source for disease.

[c] Includes 1,572 fish used as brood source for stocking in Resurrection Bay.

[d] Includes 729 fish used as brood source for stocking in Resurrection Bay.

[e] 2007 SWHS harvest data not available until fall 2008.

**Table 15.–**Angler effort, harvest rate, harvest, and spawning escapement for Russian River late-run sockeye salmon, 1963-2007.

| | Angler | | | | Spawning Escapement | | | |
|---|---|---|---|---|---|---|---|---|
| | Effort | | Harvest/ | | Above | Below | | Local |
| Year | Days | Hours | Hour | Harvest | Weir | Weir | Total | Return |
| 1963 | 2,170 | Unknown | Unknown | 1,390 | 51,120 | Unknown | Unknown | 52,510 |
| 1964 | 1,350 | 5,070 | 0.483 | 2,450 | 46,930 | Unknown | Unknown | 49,380 |
| 1965 | 1,970 | 8,280 | 0.261 | 2,160 | 21,820 | Unknown | Unknown | 23,980 |
| 1966 | 6,310 | 28,700 | 0.254 | 7,290 | 34,430 | Unknown | Unknown | 41,720 |
| 1967 | 5,500 | 29,490 | 0.194 | 5,720 | 49,480 | Unknown | Unknown | 55,200 |
| 1968 | 5,500 | 28,250 | 0.206 | 5,820 | 48,880 | 4,200 | 53,080 | 58,900 |
| 1969 | 2,640 | 12,230 | 0.094 | 1,150 | 28,872 | 1,100 | 29,972 | 31,122 |
| 1970 | 1,000 | 2,240 | 0.268 | 600 | 26,200 | 220 | 26,420 | 27,020 |
| 1971 | 8,870 | 37,390 | 0.287 | 10,730 | 54,421 | 10,000 | 64,421 | 75,151 |
| 1972 | 13,360 | 55,920 | 0.287 | 16,050 | 79,115 | 6,000 | 85,115 | 101,165 |
| 1973 | 15,470 | 81,930 | 0.109 | 8,930 | 25,068 | 6,680 | 31,748 | 40,678 |
| 1974 | 10,030 | 45,210 | 0.188 | 8,500 | 24,904 | 2,210 | 27,114 | 35,614 |
| 1975 | 11,300 | 52,770 | 0.159 | 8,390 | 31,961 | 690 | 32,651 | 41,041 |
| 1976 | 17,380 | 74,000 | 0.185 | 13,700 | 31,939 | 3,470 | 35,409 | 49,109 |
| 1977 | 31,310 | 140,780 | 0.195 | 27,440 | 21,362 | 17,090 | 38,452 | 65,892 |
| 1978 | 17,950 | 98,830 | 0.248 | 24,530 | 34,334 | 18,330 | 52,664 | 77,194 |
| 1979 | 29,330 | 124,010 | 0.216 | 26,840 | 87,852 | 3,920 | 91,772 | 118,612 |
| 1980 | 24,900 | 117,100 | 0.286 | 33,500 | 83,984 | 3,220 | 87,204 | 120,704 |
| 1981 | 26,250 | 109,250 | 0.217 | 23,720 | 44,523 | 4,160 | 48,683 | 72,403 |
| 1982 | 12,480 | 59,130 | 0.175 | 10,320 | 30,800 | 45,000 | 75,800 | 86,120 |
| 1983 | 13,300 | 66,650 | 0.240 | 16,000 | 33,734 | 44,000 | 77,734 | 93,734 |
| 1984 | 20,320 | 94,850 | 0.232 | 21,970 | 92,659 | 3,000 | 95,659 | 117,629 |
| 1985 | 34,630 | 159,160 | 0.367 | 58,410 | 136,969 | 8,650 | 145,619 | 204,029 |
| 1986 | 22,400 | 89,780 | 0.343 | 30,810 | 40,281 | 15,230 | 55,511 | 86,321 |
| 1987 | 32,650 | 132,570 | 0.306 | 40,580 | 53,932 | 76,530 | 130,462 | 171,042 |
| 1988 | 25,430 | 94,840 | 0.206 | 19,540 | 42,476 | 30,360 | 72,836 | 92,376 |
| 1989 | 39,770 | 154,510 | 0.357 | 55,210 | 138,377 | 28,480 | 166,857 | 222,067 |
| 1990 | 39,970 | 159,890 | 0.351 | 56,180 | 83,434 | 11,760 | 95,194 | 151,374 |
| 1991 | 21,090 | 78,849 | 0.399 | 31,450 | 78,175 | 22,270 | 100,445 | 131,895 |
| 1992 | 23,015 | 87,918 | 0.297 | 26,101 | 62,584 | 4,980 | 67,564 | 93,665 |
| 1993 | 23,491 | 96,312 | 0.278 | 26,772 | 99,259 | 12,258 | 111,517 | 138,289 |
| 1994 | 21,712 | 91,192 | 0.289 | 26,375 | 122,277 | 15,211 | 137,488 | 163,863 |
| 1995 | 17,166 | 72,099 | 0.164 | 11,805 | 61,982 | 12,479 | 74,461 | 86,266 |
| 1996 | 17,322 | 77,951 | 0.258 | 20,142 | 34,691 | 31,601 | 66,292 | 86,434 |
| 1997 | ND | ND | ND | 12,910 [b] | 65,905 | 11,337 | 77,242 | 90,152 |
| 1998 | ND | ND | ND | 25,110 [b] | 113,480 | 19,593 | 133,073 | 158,183 |
| 1999 | ND | ND | ND | 32,335 [b] | 139,863 | 19,514 | 159,377 | 191,712 |
| 2000 | ND | ND | ND | 30,229 [b] | 56,580 | 13,930 | 70,510 | 100,739 |
| 2001 | ND | ND | ND | 18,550 [b] | 74,964 | 17,044 | 92,008 | 110,558 |
| 2002 | ND | ND | ND | 31,999 [b] | 62,115 | 6,858 | 68,973 | 100,972 |
| 2003 | ND | ND | ND | 28,085 [b] | 157,469 | 27,474 | 184,943 | 213,028 |
| 2004 | ND | ND | ND | 22,417 [b] | 110,244 | 30,458 | 140,702 | 163,119 |
| 2005 | ND | ND | ND | 18,503 [b] | 59,473 | 29,048 | 88,521 | 107,024 |
| 2006 | ND | ND | ND | 29,694 [b] | 89,160 | 18,452 | 107,612 | 137,306 |
| 2007 | ND | ND | ND | [c] | 53,068 | 4,504 | 57,572 | - |
| Avg. (1997-2006) | | | | 24,980 | 92,930 | 19,370 | 112,300 | 137,280 |
| Avg. (1963-1996) | 17,570 | 75,500 | 0.247 | | | | | |
| Avg. (1963-2006) | | | | 21,150 | 65,180 | 14,470 | 79,650 | 100,800 |

Note: ND = no data collected; "-" = value can't be calculated until 2007 harvest data becomes available

[a] Escapement below and above weir plus harvest.

[b] Estimate of late-run harvest from Statewide Harvest Survey, unpublished data.

[c] 2007 SWHS harvest data not available until fall 2008.

**Table 16.**—Daily escapement of early-run sockeye salmon at Russian River weir in 2007 compared to the historical cumulative proportion by day.

| Date | | 2007 Escapement [a] Daily Count | Daily Proportion | Cumulative Count | Cumulative Proportion | Historical [b] Cumulative Proportion by Day |
|---|---|---|---|---|---|---|
| 07-Jun | | 0 | 0.000 | 0 | 0.000 | 0.000 |
| 08-Jun | | 0 | 0.000 | 0 | 0.000 | 0.000 |
| 09-Jun | | 29 | 0.001 | 29 | 0.001 | 0.001 |
| 10-Jun | | 138 | 0.005 | 167 | 0.006 | 0.005 |
| 11-Jun | | 552 | 0.020 | 719 | 0.026 | 0.009 |
| 12-Jun | | 777 | 0.028 | 1,496 | 0.055 | 0.017 |
| 13-Jun | | 972 | 0.036 | 2,468 | 0.090 | 0.027 |
| 14-Jun | | 1,611 | 0.059 | 4,079 | 0.149 | 0.042 |
| 15-Jun | | 1,320 | 0.048 | 5,399 | 0.198 | 0.058 |
| 16-Jun | | 2,864 | 0.105 | 8,263 | 0.303 | 0.076 |
| 17-Jun | | 1,424 | 0.052 | 9,687 | 0.355 | 0.104 |
| 18-Jun | | 1,312 | 0.048 | 10,999 | 0.403 | 0.135 |
| 19-Jun | | 775 | 0.028 | 11,774 | 0.431 | 0.158 |
| 20-Jun | | 809 | 0.030 | 12,583 | 0.461 | 0.192 |
| 21-Jun | | 422 | 0.015 | 13,005 | 0.476 | 0.225 |
| 22-Jun | [c] | 857 | 0.031 | 13,862 | 0.508 | 0.259 |
| 23-Jun | | 1,414 | 0.052 | 15,276 | 0.560 | 0.290 |
| 24-Jun | | 1,256 | 0.046 | 16,532 | 0.606 | 0.333 |
| 25-Jun | | 994 | 0.036 | 17,526 | 0.642 | 0.374 |
| 26-Jun | | 1,062 | 0.039 | 18,588 | 0.681 | 0.416 |
| 27-Jun | | 1,196 | 0.044 | 19,784 | 0.725 | 0.457 |
| 28-Jun | | 741 | 0.027 | 20,525 | 0.752 | 0.495 |
| 29-Jun | [d] | 619 | 0.023 | 21,144 | 0.775 | 0.536 |
| 30-Jun | | 321 | 0.012 | 21,465 | 0.786 | 0.574 |
| 01-Jul | | 178 | 0.007 | 21,643 | 0.793 | 0.615 |
| 02-Jul | | 215 | 0.008 | 21,858 | 0.801 | 0.668 |
| 03-Jul | | 391 | 0.014 | 22,249 | 0.815 | 0.713 |
| 04-Jul | | 843 | 0.031 | 23,092 | 0.846 | 0.748 |
| 05-Jul | | 352 | 0.013 | 23,444 | 0.859 | 0.782 |
| 06-Jul | | 485 | 0.018 | 23,929 | 0.877 | 0.817 |
| 07-Jul | | 623 | 0.023 | 24,552 | 0.899 | 0.849 |
| 08-Jul | | 188 | 0.007 | 24,740 | 0.906 | 0.876 |
| 09-Jul | | 151 | 0.006 | 24,891 | 0.912 | 0.902 |
| 10-Jul | | 86 | 0.003 | 24,977 | 0.915 | 0.921 |
| 11-Jul | | 199 | 0.007 | 25,176 | 0.922 | 0.941 |
| 12-Jul | | 1,292 | 0.047 | 26,468 | 0.970 | 0.953 |
| 13-Jul | | 376 | 0.014 | 26,844 | 0.983 | 0.983 |
| 14-Jul | | 454 | 0.017 | 27,298 | 1.000 | 1.000 |

[a] Weir count in number of fish.

[b] Cumulative proportion by day of 1978-2006 mean daily escapements.

[c] 2007 midpoint for Russian River early-run sockeye salmon.

[d] Historical midpoint for Russian River early-run sockeye salmon returns, 1978-2006.

**Table 17.–**Daily escapement of late-run sockeye salmon at Russian River weir in 2007 compared to the historical cumulative proportion by day.

| | 2007 Escapement [a] | | | | Historical [b] Cumulative Proportion by Day |
|---|---|---|---|---|---|
| | Daily | | Cumulative | | |
| Date | Count | Proportion | Count | Proportion | |
| 15-Jul | 147 | 0.003 | 147 | 0.003 | 0.003 |
| 16-Jul | 117 | 0.002 | 264 | 0.005 | 0.005 |
| 17-Jul | 208 | 0.004 | 472 | 0.009 | 0.007 |
| 18-Jul | 582 | 0.011 | 1,054 | 0.020 | 0.011 |
| 19-Jul | 273 | 0.005 | 1,327 | 0.025 | 0.016 |
| 20-Jul | 180 | 0.003 | 1,507 | 0.028 | 0.028 |
| 21-Jul | 313 | 0.006 | 1,820 | 0.034 | 0.042 |
| 22-Jul | 110 | 0.002 | 1,930 | 0.036 | 0.059 |
| 23-Jul | 96 | 0.002 | 2,026 | 0.038 | 0.071 |
| 24-Jul | 271 | 0.005 | 2,297 | 0.043 | 0.090 |
| 25-Jul | 68 | 0.001 | 2,365 | 0.045 | 0.109 |
| 26-Jul | 1,468 | 0.028 | 3,833 | 0.072 | 0.136 |
| 27-Jul | 345 | 0.007 | 4,178 | 0.079 | 0.172 |
| 28-Jul | 455 | 0.009 | 4,633 | 0.087 | 0.201 |
| 29-Jul | 485 | 0.009 | 5,118 | 0.096 | 0.225 |
| 30-Jul | 571 | 0.011 | 5,689 | 0.107 | 0.256 |
| 31-Jul | 3,219 | 0.061 | 8,908 | 0.168 | 0.279 |
| 1-Aug | 1,559 | 0.029 | 10,467 | 0.197 | 0.319 |
| 2-Aug | 559 | 0.011 | 11,026 | 0.208 | 0.350 |
| 3-Aug | 657 | 0.012 | 11,683 | 0.220 | 0.386 |
| 4-Aug | 1,556 | 0.029 | 13,239 | 0.249 | 0.429 |
| 5-Aug | 1,444 | 0.027 | 14,683 | 0.277 | 0.476 |
| 6-Aug [c] | 1,235 | 0.023 | 15,918 | 0.300 | 0.515 |
| 7-Aug | 2,022 | 0.038 | 17,940 | 0.338 | 0.547 |
| 8-Aug | 1,201 | 0.023 | 19,141 | 0.361 | 0.586 |
| 9-Aug | 1,055 | 0.020 | 20,196 | 0.381 | 0.622 |
| 10-Aug | 1,104 | 0.021 | 21,300 | 0.401 | 0.650 |
| 11-Aug | 1,636 | 0.031 | 22,936 | 0.432 | 0.675 |
| 12-Aug | 1,838 | 0.035 | 24,774 | 0.467 | 0.701 |
| 13-Aug | 1,343 | 0.025 | 26,117 | 0.492 | 0.726 |
| 14-Aug [d] | 2,039 | 0.038 | 28,156 | 0.531 | 0.750 |
| 15-Aug | 2,736 | 0.052 | 30,892 | 0.582 | 0.773 |
| 16-Aug | 3,373 | 0.064 | 34,265 | 0.646 | 0.794 |
| 17-Aug | 2,196 | 0.041 | 36,461 | 0.687 | 0.811 |

-continued-

**Table 17.**–Page 2 of 2.

| Date | 2007 Escapement [a] Daily Count | Daily Proportion | Cumulative Count | Cumulative Proportion | Historical [b] Cumulative Proportion by Day |
|---|---|---|---|---|---|
| 18-Aug | 1,724 | 0.032 | 38,185 | 0.720 | 0.829 |
| 19-Aug | 1,406 | 0.026 | 39,591 | 0.746 | 0.844 |
| 20-Aug | 1,629 | 0.031 | 41,220 | 0.777 | 0.859 |
| 21-Aug | 1,983 | 0.037 | 43,203 | 0.814 | 0.873 |
| 22-Aug | 1,520 | 0.029 | 44,723 | 0.843 | 0.883 |
| 23-Aug | 1,139 | 0.021 | 45,862 | 0.864 | 0.894 |
| 24-Aug | 1,049 | 0.020 | 46,911 | 0.884 | 0.908 |
| 25-Aug | 896 | 0.017 | 47,807 | 0.901 | 0.916 |
| 26-Aug | 808 | 0.015 | 48,615 | 0.916 | 0.927 |
| 27-Aug | 554 | 0.010 | 49,169 | 0.927 | 0.936 |
| 28-Aug | 672 | 0.013 | 49,841 | 0.939 | 0.944 |
| 29-Aug | 459 | 0.009 | 50,300 | 0.948 | 0.951 |
| 30-Aug | 559 | 0.011 | 50,859 | 0.958 | 0.958 |
| 31-Aug | 376 | 0.007 | 51,235 | 0.965 | 0.964 |
| 1-Sep | 358 | 0.007 | 51,593 | 0.972 | 0.968 |
| 2-Sep | 271 | 0.005 | 51,864 | 0.977 | 0.973 |
| 3-Sep | 141 | 0.003 | 52,005 | 0.980 | 0.977 |
| 4-Sep | 112 | 0.002 | 52,117 | 0.982 | 0.980 |
| 5-Sep | 169 | 0.003 | 52,286 | 0.985 | 0.982 |
| 6-Sep | 174 | 0.003 | 52,460 | 0.989 | 0.984 |
| 7-Sep | 90 | 0.002 | 52,550 | 0.990 | 0.986 |
| 8-Sep | 131 | 0.002 | 52,681 | 0.993 | 0.987 |
| 9-Sep | 144 | 0.003 | 52,825 | 0.995 | 0.988 |
| 10-Sep | 124 | 0.002 | 52,949 | 0.998 | 0.989 |
| 11-Sep | 76 | 0.001 | 53,025 | 0.999 | 0.990 |
| 12-Sep | 40 | 0.001 | 53,065 | 1.000 | 0.990 |
| 13-Sep | 3 | 0.000 | 53,068 | 1.000 | 0.991 |
| 14-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.991 |
| 15-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.990 |
| 16-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.976 |
| 17-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.976 |
| 18-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.976 |
| 19-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.977 |
| 20-Sep | 0 | 0.000 | 53,068 | 1.000 | 0.977 |

[a] Weir count in number of fish.

[b] Cumulative proportion by day of 1978-2006 mean daily escapements.

[c] Historical midpoint for Russian River late-run sockeye salmon returns, 1978-2006.

[d] 2007 midpoint for Russian River late-run sockeye salmon.

**Table 18.–**Inriver harvest and spawning escapement for Kenai River drainage sockeye salmon, 1981-2006.

| Year | Personal use, Subsistence, Dip Net Educational Harvest [a] | Sport Harvest below Sonar [b c] | Kenai R Sonar Count [d] | Total Inriver Return | Harvests above sonar: Kenai R. harvest below Soldotna Bridge | Kenai R Sonar to Soldotna Bridge | Kenai R above Soldotna Bridge | Kenai R Reach Not Specified [e] | Skilak Lake | Late Run Russian R | Hidden Lake Personal Use & Sport | Total Harvest above Sonar | Spawning Escapement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1981 | 0 | 3,116 | 407,639 | 410,755 | 5,270 | 2,154 | 14,451 | ND | ND | 23,720 | 0 | 40,325 | 367,314 |
| 1982 | 0 | 6,922 | 619,831 | 626,753 | 11,706 | 4,784 | 38,397 | ND | ND | 10,320 | ND | 53,501 | 566,330 |
| 1983 | 7,562 | 13,577 | 630,340 | 651,479 | 22,961 | 9,384 | 48,306 | ND | 0 | 16,000 | 0 | 73,690 | 556,650 |
| 1984 | 0 | 2,613 | 344,571 | 347,184 | 4,419 | 1,806 | 11,283 | ND | 0 | 21,970 | 17 | 35,076 | 309,495 |
| 1985 | 0 | 8,835 | 502,820 | 511,655 | 14,941 | 6,106 | 42,272 | ND | 0 | 58,410 | 149 | 106,937 | 395,883 |
| 1986 | 0 | 12,522 | 501,157 | 513,679 | 21,177 | 8,655 | 51,221 | ND | 13 | 30,810 | 0 | 90,699 | 410,458 |
| 1987 | 24,086 | 50,274 | 1,596,871 | 1,671,231 | 85,020 | 34,746 | 155,799 | ND | 2,029 | 40,580 | 689 | 233,843 | 1,363,028 |
| 1988 | 16,880 | 29,345 | 1,021,469 | 1,067,694 | 49,627 | 20,282 | 103,124 | ND | 382 | 19,540 | 583 | 143,911 | 877,558 |
| 1989 | 51,188 | 66,162 | 1,599,959 | 1,717,309 | 111,889 | 45,727 | 165,336 | ND | 1,654 | 55,210 | 331 | 268,258 | 1,331,701 |
| 1990 | 3,477 | 19,640 | 659,520 | 682,637 | 33,213 | 13,573 | 85,074 | ND | 670 | 56,180 | 107 | 155,604 | 503,916 |
| 1991 | 13,433 | 31,536 | 647,597 | 692,566 | 53,331 | 21,795 | 108,271 | ND | 2,411 | 31,450 | 77,060 | 240,987 | 406,610 |
| 1992 | 30,394 | 47,622 | 994,798 | 1,072,814 | 80,535 | 32,913 | 161,956 | ND | 1,044 | 26,101 | 468 | 222,482 | 772,316 |
| 1993 | 35,000 | 27,717 | 813,617 | 876,334 | 46,873 | 19,156 | 90,306 | ND | 825 | 26,772 | 133 | 137,192 | 676,425 |
| 1994 | 15,368 | 17,954 | 1,003,446 | 1,036,768 | 30,363 | 12,409 | 63,253 | ND | 213 | 26,375 | 102 | 102,352 | 901,094 |
| 1995 | 15,720 | 29,451 | 630,447 | 675,618 | 49,806 | 20,355 | 75,622 | ND | 177 | 11,805 | 83 | 108,042 | 522,405 |
| 1996 | 104,110 | 39,810 | 797,847 | 941,767 | 67,324 | 27,514 | 118,967 | ND | 307 | 19,136 | 225 | 166,149 | 631,698 |
| 1997 | 116,107 | 43,642 | 1,064,818 | 1,224,567 | 73,805 | 30,163 | 103,328 | ND | 312 | 12,910 | 274 | 146,987 | 917,831 |
| 1998 | 105,497 | 33,980 | 767,558 | 907,035 | 57,464 | 23,484 | 107,072 | ND | 158 | 25,110 | 81 | 155,905 | 611,653 |
| 1999 | 150,993 | 46,043 | 803,379 | 1,000,415 | 77,865 | 31,822 | 122,709 | ND | 0 | 32,335 | 859 | 187,725 | 615,654 |
| 2000 | 99,571 | 57,978 | 624,578 | 782,127 | 98,048 | 40,070 | 132,935 | ND | 377 | 30,229 | 190 | 203,801 | 420,777 |
| 2001 | 152,580 | 51,374 | 650,036 | 853,990 | 86,880 | 35,506 | 113,882 | ND | 24 | 18,550 | 142 | 168,104 | 481,932 |
| 2002 | 182,229 | 46,693 | 957,924 | 1,186,846 | 78,964 | 32,271 | 143,211 | 3,742 | 1,509 | 31,999 | 308 | 213,040 | 744,884 |
| 2003 | 227,207 | 60,722 | 1,181,309 | 1,469,238 | 102,689 | 41,967 | 173,068 | 10,168 | 96 | 28,085 | 302 | 253,686 | 927,623 |
| 2004 | 266,937 | 62,397 | 1,385,981 | 1,715,315 | 105,521 | 43,124 | 182,722 | 5,795 | 276 | 22,417 | 437 | 254,771 | 1,131,210 |
| 2005 | 300,105 | 58,017 | 1,376,452 | 1,734,574 | 98,114 | 40,097 | 182,704 | 13,469 | 45 | 18,503 | 0 | 254,818 | 1,121,634 |
| 2006 | 130,486 | 30,964 | 1,499,692 | 1,661,142 | 52,364 | 21,400 | 113,972 | 7,089 | 98 | 29,694 | 385 | 172,638 | 1,327,054 |
| Avg. (2002-2006) | | | | | | | | 8,050 | | | | | |
| Avg. (1997-2006) | 173,170 | 49,180 | 1,031,170 | 1,253,520 | 83,170 | 33,990 | 137,560 | | 290 | 24,980 | 300 | 201,150 | 830,030 |
| Avg. (1983-2006) | | | | | | | | | 530 | | | | |
| Avg. (1981-2006) | 78,810 | 34,570 | 887,830 | 1,001,210 | 58,470 | 23,890 | 104,200 | | | 27,850 | 3,320 | 161,170 | 726,660 |

[a] Personal use harvest not known in 1982; 1981 and 1983-1995 from Statewide Harvest Surveys (SWHS, Mills 1982-1994; Howe et al. 1995, 1996). 1996-2000 total reported harvest from returned permits, expanded to include permits not returned. Subsistence dip net harvest 1991-1992 and 1994 from Brannian and Fox (1996). Educational is total annual Kenaitze educational permit harvest.

[b] Sport harvest and 1991 Hidden Lake personal use from SWHS (Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication).

[c] In 1994 and 1995 a creel survey was conducted to estimate harvest below the sonar. In 1994, 49.7% of the below Soldotna bridge harvest was taken below the sonar. In 1995, 68.6% was taken below the sonar. The average of these two percentages is applied to all other year's below-bridge harvest to estimate the harvest below the sonar.

[d] Estimated escapement at sonar site (Westerman and Willette 2006).

[e] SWHS began collecting "Kenai River Reach Not Specified" data in 2002. ND = no date collected.

**Table 19.**—Sport fish harvest of Kenai River sockeye salmon by river section and total angler effort for all species, 1981-2006.

| | Sport Fish Harvest | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cook Inlet to Soldotna Bridge | | Soldotna Bridge to Moose River | | Moose River to Skilak Lake | | Skilak Lake to Kenai Lake | | Kenai River Reach Not Specified [a] | | | Total Angler for all |
| Year | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Total | (angler-days) |
| 1981 | 5,270 | 26.7 | 5,336 | 27.1 | 4,266 | 21.6 | 4,849 | 24.6 | ND | ND | 19,721 | 178,716 |
| 1982 | 11,706 | 23.4 | 14,829 | 29.6 | 12,136 | 24.2 | 11,432 | 22.8 | ND | ND | 50,103 | 231,948 |
| 1983 | 22,961 | 32.2 | 22,454 | 31.5 | 15,180 | 21.3 | 10,672 | 15.0 | ND | ND | 71,267 | 229,228 |
| 1984 | 4,419 | 28.1 | 2,183 | 13.9 | 2,300 | 14.6 | 6,800 | 43.3 | ND | ND | 15,702 | 270,422 |
| 1985 | 14,941 | 26.1 | 13,025 | 22.8 | 13,299 | 23.2 | 15,948 | 27.9 | ND | ND | 57,213 | 322,230 |
| 1986 | 21,177 | 29.3 | 13,846 | 19.1 | 13,533 | 18.7 | 23,842 | 32.9 | ND | ND | 72,398 | 335,051 |
| 1987 | 85,020 | 35.3 | 65,841 | 27.3 | 39,926 | 16.6 | 50,032 | 20.8 | ND | ND | 240,819 | 289,165 |
| 1988 | 49,627 | 32.5 | 43,494 | 28.5 | 29,178 | 19.1 | 30,452 | 19.9 | ND | ND | 152,751 | 374,259 |
| 1989 | 111,889 | 40.4 | 90,550 | 32.7 | 45,844 | 16.5 | 28,942 | 10.4 | ND | ND | 277,225 | 376,902 |
| 1990 | 33,213 | 28.1 | 37,201 | 31.4 | 22,083 | 18.7 | 25,790 | 21.8 | ND | ND | 118,287 | 342,662 |
| 1991 | 53,331 | 33.0 | 56,059 | 34.7 | 24,768 | 15.3 | 27,444 | 17.0 | ND | ND | 161,602 | 323,368 |
| 1992 | 80,535 | 33.2 | 85,942 | 35.4 | 40,616 | 16.7 | 35,398 | 14.6 | ND | ND | 242,491 | 332,573 |
| 1993 | 46,873 | 34.2 | 41,466 | 30.2 | 18,724 | 13.6 | 30,116 | 22.0 | ND | ND | 137,179 | 324,120 |
| 1994 | 30,363 | 32.4 | 24,307 | 26.0 | 12,374 | 13.2 | 26,572 | 28.4 | ND | ND | 93,616 | 340,904 |
| 1995 | 49,806 | 39.7 | 38,602 | 30.8 | 17,606 | 14.0 | 19,414 | 15.5 | ND | ND | 125,428 | 377,710 |
| 1996 | 67,324 | 36.1 | 51,866 | 27.8 | 29,391 | 15.8 | 37,710 | 20.2 | ND | ND | 186,291 | 265,986 |
| 1997 | 73,805 | 41.7 | 56,784 | 32.1 | 23,626 | 13.3 | 22,918 | 12.9 | ND | ND | 177,133 | 247,898 |
| 1998 | 57,464 | 34.9 | 61,763 | 37.5 | 24,315 | 14.8 | 20,994 | 12.8 | ND | ND | 164,536 | 216,650 |
| 1999 | 77,865 | 38.8 | 61,344 | 30.6 | 27,569 | 13.7 | 33,796 | 16.8 | ND | ND | 200,574 | 307,446 |
| 2000 | 98,048 | 42.4 | 74,132 | 32.1 | 30,825 | 13.3 | 27,978 | 12.1 | ND | ND | 230,983 | 358,569 |
| 2001 | 86,880 | 43.3 | 73,841 | 36.8 | 19,616 | 9.8 | 20,425 | 10.2 | ND | ND | 200,762 | 298,817 |
| 2002 | 78,964 | 35.0 | 79,608 | 35.2 | 23,488 | 10.4 | 40,115 | 17.8 | 3,742 | 1.7 | 225,917 | 312,785 |
| 2003 | 102,689 | 35.9 | 116,383 | 40.7 | 30,914 | 10.8 | 25,771 | 9.0 | 10,168 | 3.6 | 285,925 | 320,747 |
| 2004 | 105,521 | 35.9 | 111,048 | 37.8 | 42,489 | 14.5 | 29,185 | 9.9 | 5,795 | 2.0 | 294,038 | 375,370 |
| 2005 | 98,114 | 33.3 | 115,270 | 39.2 | 32,655 | 11.1 | 34,779 | 11.8 | 13,469 | 4.6 | 294,287 | 388,677 |
| 2006 | 52,364 | 30.2 | 71,854 | 41.4 | 22,177 | 12.8 | 19,941 | 11.5 | 7,089 | 4.1 | 173,425 | 329,122 |
| Avg. (2002-2006) | | | | | | | | | 8,050 | 3.2 | | |
| Avg. (1997-2006) | 83,170 | 37.1 | 82,200 | 36.3 | 27,770 | 12.5 | 27,590 | 12.5 | | | 224,760 | 315,610 |
| Avg. (1981-2006) | 58,470 | 33.9 | 54,960 | 31.2 | 23,800 | 15.7 | 25,440 | 18.5 | | | 164,220 | 310,440 |

*Source:* Statewide Harvest Surveys (SWHS, Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication).

[a] SWHS began collecting "Kenai River Reach Not Specified" data in 2002. ND = no data collected.

[b] Number = number of fish.

**Table 20.–**Coho salmon harvest in Cook Inlet and Kenai River, 1993-2006.

| | Cook Inlet commercial harvest | | | | Estimated harvest of Kenai River coho salmon | | | | | | | | Percent contribution select commercial fisheries to overall harvest Kenai River[f] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Drift Gillnet Total [a] | Central District ESSN Total [a,b] | North District Set Gillnet Total [a] | Kalgan I/ West Side Total [a] | Drift Gillnet Total [a,c] | Central District ESSN Total [b,c] | North District Set Gillnet Total [c] | Kenai R Sport Fish Total [d] | Russian R Sport Fish Total [d] | Personal Use and Subsistence Total [e] | Educational Fishery Total | Total | |
| 1993 | 121,829 | 43,098 | 106,294 | 35,661 | 930 | 6,806 | 148 | 50,538 | 2,290 | 1,597 [g] | 427 | 62,736 | 12.6 |
| 1994 | 310,114 | 68,449 | 144,064 | 61,166 | 11,732 | 14,673 | 477 | 86,711 | 4,607 | 2,535 [h] | 829 | 121,564 | 22.1 |
| 1995 | 241,473 | 44,750 | 89,300 | 71,431 | 6,956 | 13,152 | 582 | 46,183 | 4,077 | 1,261 [g] | 868 | 73,079 | 28.3 |
| 1996 | 171,434 | 40,724 | 78,105 | 31,405 | 2,671 | 11,856 | 29 | 42,293 | 4,599 | 1,932 [g] | 592 | 63,972 | 22.8 |
| 1997 | 78,662 | 19,668 | 37,369 | 16,705 | 1,236 | 2,093 | 36 | 16,164 | 4,586 | 559 [g] | 191 | 24,865 | 13.5 |
| 1998 | 83,338 | 18,677 | 34,359 | 24,286 | 1,974 | 8,096 | 175 | 26,967 | 4,612 | 1,011 [g] | 638 | 43,473 | 23.6 |
| 1999 | 64,814 | 11,923 | 31,446 | 17,725 | 818 | 2,905 | 171 | 31,637 | 3,910 | 1,009 [g] | 530 | 40,980 | 9.5 |
| 2000 | 131,478 | 11,078 | 71,475 | 22,840 | 531 | 2,351 | 83 | 48,519 | 3,938 | 1,449 [g] | 656 | 57,527 | 5.2 |
| 2001 | 39,418 | 4,246 | 45,928 | 23,719 | 282 | 349 | 1,303 | 49,782 | 5,222 | 1,555 [g] | 572 | 59,065 | 3.3 |
| 2002 | 125,831 | 35,153 | 502,922 | 35,005 | 1,370 | 4,688 | 57 | 59,650 | 6,093 | 1,721 [g] | 921 | 74,500 | 8.2 |
| 2003 | 52,432 | 10,171 | 24,015 | 15,138 | 330 | 2,122 | 126 | 46,622 | 5,197 | 1,332 [g] | 439 | 56,168 | 4.6 |
| 2004 | 198,493 | 30,137 | 44,130 | 36,257 | 4,251 [i] | 5,921 [i] | 977 [i] | 65,915 | 6,574 | 2,661 [g] | 765 | 87,064 | 12.8 |
| 2005 | 144,753 | 19,543 | 30,859 | 29,502 | 1,533 [i] | 3,310 [i] | 176 [i] | 50,411 | 3,868 | 2,512 [g] | 489 | 62,299 | 8.1 |
| 2006 | 98,473 | 22,556 | 20,215 | 36,450 | n/a [j] | n/a [j] | n/a [j] | 37,639 | 5,431 | 2,235 [g] | 689 | n/a [j] | n/a |
| Avg (1997-2006) | 101,770 | 18,320 | 84,270 | 25,760 | 1,230 | 3,180 | 310 | 43,330 | 4,940 | 1,600 | 590 | 50,590 | 8.9 |
| Avg(1993-2006) | 133,040 | 27,160 | 90,030 | 32,660 | 2,470 | 5,590 | 310 | 47,070 | 4,640 | 1,670 | 610 | 59,090 | 10.0 |

[a] Some commercial harvest estimates have been revised (due to discovery of lost or late fish tickets). The Kenai River coho salmon commercial harvest contribution estimates were generated and reported based on slightly lower total commercial harvest estimates. N. District = Northern District.

[b] Central District (C. District) eastside setnet (ESSN) commercial fishery.

[c] Sources: (Carlon and Hasbrouck 1994, 1996-1998; Carlon 2000, 2003; Massengill and Carlon 2004 a-b, 2007 a-b; Massengill *In prep*).

[d] Source: Statewide Harvest Surveys (Mills 1994; Howe et al. 1995, 1996, 2001 a-d (1996-2000 are revised estimates); Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication (includes Hidden and Skilak lake harvests)).

[e] Source of personal use and subsistence harvest (Mills 1994; Brannian and Fox 1996; Ruesch and Fox 1996; Reimer and Sigurdsson 2004; K.H. Sundet, Sport Fish Research Analyst, ADF&G, Anchorage; personal communication).

[f] Percent of Kenai River original coho salmon caught in combined Upper Cook Inlet drift gillnets, eastside set gillnet, and Northern District get gillnet commercial harvests, Kalgin Island and West Side setnet harvest historically an insignificant harvest of Kenai River coho salmon and is not counted?

[g] Personal use.

[h] Subsistence.

[i] Preliminary Kenai River origin coho salmon commercial harvest contribution data.

[j] 2005 was the final year the contribution of Kenai River coho salmon was estimated for Upper Cook Inlet.

**Table 21.–**Estimated sport fish harvest of Kenai River coho salmon by river section, 1977-2006.

| | Kenai R Lower Section[a] | | | Kenai R Middle Section[b] | | | Kenai R Upper Section[c] | | | Inter-Lake[d] | | | Reach Not Specified[e] | | | All Sections | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Early Run | Late Run | Total | Early Run | Late Run | Total | Early Run | Late Run | Total | Early Run | Late Run | Total | Early Run | Late Run | Total | Early Run | Late Run | Total |
| 1977 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9,537 |
| 1978 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10,823 |
| 1979 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 15,276 |
| 1980 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 26,838 |
| 1981 | ND | ND | 12,280 | ND | ND | 3,326 | ND | ND | 6,178 | ND | ND | 540 | ND | ND | ND | ND | ND | 22,324 |
| 1982 | ND | ND | 26,582 | ND | ND | 3,904 | ND | ND | 7,200 | ND | ND | 1,729 | ND | ND | ND | ND | ND | 39,415 |
| 1983 | ND | ND | 12,231 | ND | ND | 4,007 | ND | ND | 4,867 | ND | ND | 1,573 | ND | ND | ND | ND | ND | 22,678 |
| 1984 | ND | ND | 40,173 | ND | ND | 7,596 | ND | ND | 8,065 | ND | ND | 3,810 | ND | ND | ND | ND | ND | 59,644 |
| 1985 | ND | ND | 22,579 | ND | ND | 6,781 | ND | ND | 12,774 | ND | ND | 2,401 | ND | ND | ND | ND | ND | 44,535 |
| 1986 | ND | ND | 38,338 | ND | ND | 10,336 | ND | ND | 8,348 | ND | ND | 3,088 | ND | ND | ND | ND | ND | 60,110 |
| 1987 | ND | ND | 19,612 | ND | ND | 6,222 | ND | ND | 4,077 | ND | ND | 3,299 | ND | ND | ND | ND | ND | 33,210 |
| 1988 | ND | ND | 34,690 | ND | ND | 4,863 | ND | ND | 5,714 | ND | ND | 3,427 | ND | ND | ND | ND | ND | 48,694 |
| 1989 | ND | ND | 36,668 | ND | ND | 7,921 | ND | ND | 8,236 | ND | ND | 2,434 | ND | ND | ND | ND | ND | 55,259 |
| 1990 | ND | ND | 40,567 | ND | ND | 8,446 | ND | ND | 7,281 | ND | ND | 4,031 | ND | ND | ND | ND | ND | 60,325 |
| 1991 | ND | ND | 49,499 | ND | ND | 13,438 | ND | ND | 9,520 | ND | ND | 3,699 | ND | ND | ND | ND | ND | 76,156 |
| 1992 | ND | ND | 33,175 | ND | ND | 7,579 | ND | ND | 7,547 | ND | ND | 4,009 | ND | ND | ND | ND | ND | 52,310 |
| 1993 | ND | ND | 29,135 | ND | ND | 9,677 | ND | ND | 6,771 | ND | ND | 4,955 | ND | ND | ND | ND | ND | 50,538 |
| 1994 | ND | ND | 46,345 | ND | ND | 15,249 | ND | ND | 12,286 | ND | ND | 12,831 | ND | ND | ND | ND | ND | 86,711 |
| 1995 | 20,031 | 11,808 | 31,839 | 4,842 | 1,131 | 5,973 | 2,785 | 2,794 | 5,579 | 2,065 | 727 | 2,792 | ND | ND | ND | 29,723 | 16,460 | 46,183 |
| 1996 | 17,551 | 5,010 | 22,561 | 8,347 | 2,076 | 10,423 | 4,371 | 1,682 | 6,053 | 2,457 | 799 | 3,256 | ND | ND | ND | 32,726 | 9,567 | 42,293 |
| 1997 | 5,570 | 1,293 | 6,863 | 2,858 | 1,319 | 4,177 | 1,752 | 1,330 | 3,082 | 1,587 | 455 | 2,042 | ND | ND | ND | 11,767 | 4,397 | 16,164 |
| 1998 | 9,955 | 5,506 | 15,461 | 3,667 | 1,430 | 5,097 | 2,373 | 1,833 | 4,206 | 1,764 | 439 | 2,203 | ND | ND | ND | 17,759 | 9,208 | 26,967 |
| 1999 | 14,413 | 6,029 | 20,442 | 4,732 | 654 | 5,386 | 1,268 | 1,812 | 3,080 | 1,951 | 778 | 2,729 | ND | ND | ND | 22,364 | 9,273 | 31,637 |
| 2000 | 22,392 | 8,444 | 30,836 | 8,185 | 1,880 | 10,065 | 3,894 | 1,159 | 5,053 | 1,652 | 913 | 2,565 | ND | ND | ND | 36,123 | 12,396 | 48,519 |
| 2001 | 23,501 | 8,977 | 32,478 | 7,381 | 1,947 | 9,328 | 3,565 | 1,986 | 5,551 | 1,672 | 753 | 2,425 | ND | ND | ND | 36,119 | 13,663 | 49,782 |
| 2002 | 27,062 | 9,641 | 36,703 | 8,220 | 2,630 | 10,850 | 2,663 | 2,406 | 5,069 | 3,965 | 886 | 4,851 | 1,552 | 625 | 2,177 | 43,462 | 16,188 | 59,650 |
| 2003 | 20,093 | 5,963 | 26,056 | 8,961 | 2,029 | 10,990 | 3,160 | 1,517 | 4,677 | 2,690 | 490 | 3,180 | 1,367 | 352 | 1,719 | 36,271 | 10,351 | 46,622 |
| 2004 | 29,606 | 12,010 | 41,616 | 9,145 | 4,055 | 13,200 | 3,492 | 2,234 | 5,726 | 2,733 | 868 | 3,601 | 1,135 | 637 | 1,772 | 46,111 | 19,804 | 65,915 |
| 2005 | 17,331 | 7,810 | 25,141 | 10,793 | 3,563 | 14,356 | 1,697 | 2,739 | 4,436 | 2,310 | 2,103 | 4,413 | 1,699 | 366 | 2,065 | 33,830 | 16,581 | 50,411 |
| 2006 | 13,817 | 7,132 | 20,949 | 4,800 | 2,331 | 7,131 | 1,890 | 2,939 | 4,829 | 2,638 | 890 | 3,528 | 797 | 405 | 1,202 | 23,942 | 13,697 | 37,639 |
| Avg (2002-2006) | | | | | | | | | | | | | 1,310 | 477 | 1,787 | | | |
| Avg (1997-2006) | 18,374 | 7,281 | 25,655 | 6,874 | 2,184 | 9,058 | 2,575 | 1,996 | 4,571 | 2,296 | 858 | 3,154 | | | | 30,775 | 12,556 | 43,331 |
| Avg (1995-2006) | 18,444 | 7,469 | | 6,828 | 2,087 | | 2,743 | 2,036 | | 2,290 | 842 | | | | | 30,850 | 12,632 | |
| Avg (1981-2006) | | | 28,955 | | | 8,320 | | | 6,393 | | | 3,439 | | | | | | |
| Avg (1977-2006) | | | | | | | | | | | | | | | | | | 43,206 |

*Source:* all data from Statewide Harvest Surveys (SWHS, Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). ND = no data collected.

[a] Cook Inlet to Soldotna bridge.

[b] Soldotna bridge to Moose River.

[c] Moose River to Skilak Lake.

[d] Skilak Lake to Kenai Lake.

[e] Kenai River Reach Not Specified - adopted by SWHS beginning in 2002.

**Table 22.–**Kenai River rainbow trout, number caught and number retained by river section, 1984-2006.

| | Kenai River sections | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cook Inlet to Soldotna Bridge | | | Soldotna Bridge to Moose R | | | Moose R to Skilak Outlet | | | Skilak Inlet to Kenai Lake | | | Kenai R - reach not specified [a] | | | Kenai River Total | | |
| Year | Number Caught[b] | Number Kept | Percent Kept | Number Caught[b] | Number Kept | Percent Kept | Number Caught[b] | Number Kept | Percent Kept | Number Caught[b] | Number Kept | Percent Kept | Number Caught[b] | Number Kept | Percent Kept | Number Caught[b] | Number Kept | Percent Kept |
| 1984 [c] | 3,464 | 710 | 20.5 | 2,911 | 1,250 | 42.9 | 5,112 | 580 | 11.3 | 4,200 | 930 | 22.1 | ND | ND | ND | 15,687 | 3,470 | 22.1 |
| 1985 [c] | 3,398 | 880 | 25.9 | 2,653 | 850 | 32.0 | 5,410 | 1,500 | 27.7 | 3,520 | 710 | 20.2 | ND | ND | ND | 14,981 | 3,940 | 26.3 |
| 1986 | 2,570 | 623 | 24.2 | 2,380 | 168 | 7.1 | 1,750 | 901 | 51.5 | 2,020 | 733 | 36.3 | ND | ND | ND | 8,720 | 2,425 | 27.8 |
| 1987 | 2,220 | 522 | 23.5 | 3,450 | 670 | 19.4 | 6,430 | 629 | 9.8 | 3,870 | 364 | 9.4 | ND | ND | ND | 15,970 | 2,185 | 13.7 |
| 1988 | 2,780 | 295 | 10.6 | 1,560 | 216 | 13.8 | 5,880 | 1,063 | 18.1 | 7,580 | 559 | 7.4 | ND | ND | ND | 17,800 | 2,133 | 12.0 |
| 1989 | 2,020 | 481 | 23.8 | 2,230 | 354 | 15.9 | 6,470 | 829 | 12.8 | 6,870 | 253 | 3.7 | ND | ND | ND | 17,590 | 1,917 | 10.9 |
| 1990 | 2,624 | 510 | 19.4 | 3,571 | 943 | 26.4 | 5,366 | 937 | 17.5 | 11,995 | 1,145 | 9.5 | ND | ND | ND | 23,556 | 3,535 | 15.0 |
| 1991 | 3,672 | 516 | 14.1 | 3,844 | 1,123 | 29.2 | 7,930 | 940 | 11.9 | 18,108 | 740 | 4.1 | ND | ND | ND | 33,554 | 3,319 | 9.9 |
| 1992 | 4,448 | 427 | 9.6 | 3,879 | 411 | 10.6 | 15,127 | 736 | 4.9 | 28,702 | 403 | 1.4 | ND | ND | ND | 52,160 | 1,980 | 3.8 |
| 1993 | 6,190 | 1,149 | 18.6 | 5,556 | 580 | 10.4 | 12,651 | 653 | 5.2 | 37,755 | 192 | 0.5 | ND | ND | ND | 62,150 | 2,570 | 4.1 |
| 1994 | 3,796 | 506 | 13.3 | 3,980 | 364 | 9.1 | 10,968 | 543 | 5.0 | 35,089 | 163 | 0.5 | ND | ND | ND | 53,833 | 1,576 | 2.9 |
| 1995 | 4,516 | 620 | 13.7 | 4,087 | 440 | 10.8 | 13,072 | 780 | 6.0 | 33,475 | 310 | 0.9 | ND | ND | ND | 55,150 | 2,150 | 3.9 |
| 1996 | 5,513 | 304 | 5.5 | 4,777 | 646 | 13.5 | 8,650 | 373 | 4.3 | 45,471 | 237 | 0.5 | ND | ND | ND | 64,411 | 1,560 | 2.4 |
| 1997 | 7,411 | 739 | 10.0 | 6,641 | 539 | 8.1 | 20,047 | 632 | 3.2 | 61,053 | 0[d] | 0.0[d] | ND | ND | ND | 95,152 | 1,910 | 2.0 |
| 1998 | 5,502 | 608 | 11.1 | 5,380 | 670 | 12.5 | 12,158 | 737 | 6.1 | 42,224 | 0[d] | 0.0[d] | ND | ND | ND | 65,264 | 2,015 | 3.1 |
| 1999 | 11,415 | 1,516 | 13.3 | 8,325 | 695 | 8.3 | 32,050 | 1,573 | 4.9 | 50,189 | 0[d] | 0.0[d] | ND | ND | ND | 101,979 | 3,784 | 3.7 |
| 2000 | 16,477 | 1,292 | 7.8 | 9,428 | 1,083 | 11.5 | 18,990 | 1,084 | 5.7 | 78,836 | 0[d] | 0.0[d] | ND | ND | ND | 123,731 | 3,459 | 2.8 |
| 2001 | 11,216 | 987 | 8.8 | 7,473 | 868 | 11.6 | 22,392 | 567 | 2.5 | 51,130 | 0[d] | 0.0[d] | ND | ND | ND | 92,211 | 2,422 | 2.6 |
| 2002 | 12,641 | 995 | 7.9 | 8,157 | 944 | 11.6 | 19,355 | 864 | 4.5 | 71,753 | 0[d] | 0.0[d] | 2,269 | 216 | 9.5 | 114,175 | 3,019 | 2.6 |
| 2003 | 12,844 | 1,026 | 8.0 | 10,913 | 700 | 6.4 | 41,204 | 372 | 0.9 | 54,552 | 0[d] | 0.0[d] | 3,536 | 180 | 5.1 | 123,049 | 2,278 | 1.9 |
| 2004 | 15,080 | 1,452 | 9.6 | 13,310 | 978 | 7.3 | 34,026 | 831 | 2.4 | 91,443 | 0[d] | 0.0[d] | 5,651 | 50 | 0.9 | 159,510 | 3,311 | 2.1 |
| 2005 | 14,119 | 953 | 6.7 | 11,585 | 647 | 5.6 | 34,675 | 607 | 1.8 | 57,936 | 267 | 0.5 | 7,949 | 43 | 0.5 | 126,264 | 2,517 | 2.0 |
| 2006 | 13,168 | 588 | 4.5 | 13,683 | 1,109 | 8.1 | 33,222 | 472 | 1.4 | 67,741 | 289 | 0.4 | 4,005 | 41 | 1.0 | 131,819 | 2,499 | 1.9 |
| | | | | | | | | Averages | | | | | | | | | | |
| (2005-2006) | | | | | | | | | | 62,839 | 278 | 0.4 | | | | | | |
| (2002-2006) | | | | | | | | | | | | | 4,680 | 110 | 3.4 | | | |
| (1997-2006) | 11,990 | 1,020 | 8.8 | 9,490 | 820 | 9.1 | 26,810 | 770 | 3.3 | 62,690 | | | | | | 113,320 | 2,720 | 2.5 |
| (1984-1996) | | | | | | | | | | 18,358 | 518 | 9.0 | | | | | | |
| (1984-2006) | 7,260 | 770 | 13.5 | 6,080 | 710 | 14.4 | 16,210 | 790 | 9.5 | 37,630 | | | | | | 68,210 | 2,610 | 7.8 |

*Source:* Statewide Harvest Surveys (SWHS, Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). Catch = fish harvested plus fish released. Harvest = fish kept (retained). ND = no data collected.

[a] Adopted by SWHS in 2002.

[b] Catch estimates from 1984-1989 are unpublished estimates from the SWHS data base (M.J. Mills, Sport Fish Biometrician, ADF&G, Anchorage; personal communication).

[c] In 1984 and 1985, catch estimates were mistakenly reported as harvest in Mills (1985-1986). Corrected harvest numbers are presented here.

[d] Retention of rainbow trout was prohibited from 1977 through 2004.

**Table 23.–** Kenai River Dolly Varden harvest and catch by river section, 1984-2006.

| | Harvest | | | | | | | | | | | Catch | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cook Inlet to Soldotna Bridge | | Soldotna Bridge to Moose R | | Moose River to Skilak Lake | | Skilak Inlet to Kenai Lake | | Kenai River reach not specified [a] | | Total | Cook Inlet to Soldotna Bridge | | Soldotna Bridge to Moose R | | Moose River to Skilak Lake | | Skilak Inlet to Kenai Lake | | Kenai River reach not specified [a] | | Total |
| Year | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number |
| 1984 | 7,506 | 23.9 | 1,966 | 6.3 | 11,211 | 35.7 | 10,724 | 34.1 | ND | ND | 31,407 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1985 | 7,560 | 28.8 | 3,277 | 12.5 | 8,930 | 34.0 | 6,468 | 24.7 | ND | ND | 26,235 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1986 | 1,249 | 21.6 | 771 | 13.4 | 1,928 | 33.4 | 1,827 | 31.6 | ND | ND | 5,775 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1987 | 2,429 | 31.8 | 1,671 | 21.9 | 2,139 | 28.0 | 1,391 | 18.2 | ND | ND | 7,630 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1988 | 3,531 | 32.2 | 1,266 | 11.5 | 3,527 | 32.1 | 2,653 | 24.2 | ND | ND | 10,977 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1989 | 3,414 | 33.9 | 1,371 | 13.6 | 3,649 | 36.3 | 1,630 | 16.2 | ND | ND | 10,064 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| 1990 | 2,738 | 22.9 | 2,424 | 20.2 | 2,741 | 22.9 | 4,079 | 34.0 | ND | ND | 11,982 | 7,795 | 22.5 | 5,094 | 14.7 | 7,537 | 21.8 | 14,151 | 40.9 | ND | ND | 34,577 |
| 1991 | 4,211 | 29.0 | 3,285 | 22.6 | 4,268 | 29.4 | 2,740 | 18.9 | ND | ND | 14,504 | 10,665 | 15.5 | 8,116 | 11.8 | 19,363 | 28.2 | 30,601 | 44.5 | ND | ND | 68,745 |
| 1992 | 3,777 | 26.1 | 2,516 | 17.4 | 4,900 | 33.9 | 3,269 | 22.6 | ND | ND | 14,462 | 11,822 | 15.0 | 5,899 | 7.5 | 26,348 | 33.4 | 34,754 | 44.1 | ND | ND | 78,823 |
| 1993 | 4,599 | 36.2 | 1,539 | 12.1 | 3,503 | 27.6 | 3,057 | 24.1 | ND | ND | 12,698 | 13,019 | 17.1 | 6,079 | 8.0 | 20,778 | 27.2 | 36,451 | 47.8 | ND | ND | 76,327 |
| 1994 | 3,276 | 38.6 | 1,107 | 13.0 | 2,051 | 24.2 | 2,052 | 24.2 | ND | ND | 8,486 | 8,752 | 14.2 | 5,185 | 8.4 | 14,584 | 23.6 | 33,168 | 53.8 | ND | ND | 61,689 |
| 1995 | 4,069 | 42.7 | 1,732 | 18.2 | 2,113 | 22.2 | 1,609 | 16.9 | ND | ND | 9,523 | 10,146 | 18.4 | 5,399 | 9.8 | 12,447 | 22.6 | 27,103 | 49.2 | ND | ND | 55,095 |
| 1996 | 2,411 | 32.2 | 1,797 | 24.0 | 1,995 | 26.7 | 1,281 | 17.1 | ND | ND | 7,484 | 9,787 | 17.3 | 5,973 | 10.6 | 14,506 | 25.7 | 26,245 | 46.4 | ND | ND | 56,511 |
| 1997 | 2,518 | 36.2 | 1,042 | 15.0 | 2,824 | 40.6 | 573 | 8.2 | ND | ND | 6,957 | 9,955 | 11.0 | 5,268 | 5.8 | 22,266 | 24.5 | 53,317 | 58.7 | ND | ND | 90,806 |
| 1998 | 1,977 | 32.5 | 1,787 | 29.4 | 1,847 | 30.4 | 468 | 7.7 | ND | ND | 6,079 | 7,560 | 12.4 | 5,961 | 9.8 | 11,732 | 19.3 | 35,659 | 58.5 | ND | ND | 60,912 |
| 1999 | 3,867 | 51.1 | 1,086 | 14.3 | 1,932 | 25.5 | 683 | 9.0 | ND | ND | 7,568 | 14,752 | 20.2 | 6,316 | 8.7 | 20,053 | 27.5 | 31,826 | 43.6 | ND | ND | 72,947 |
| 2000 | 3,916 | 52.7 | 1,759 | 23.7 | 1,403 | 18.9 | 349 | 4.7 | ND | ND | 7,427 | 18,261 | 17.4 | 9,122 | 8.7 | 21,291 | 20.3 | 56,375 | 53.7 | ND | ND | 105,049 |
| 2001 | 3,763 | 57.6 | 1,613 | 24.7 | 789 | 12.1 | 363 | 5.6 | ND | ND | 6,528 | 16,304 | 15.1 | 8,367 | 7.8 | 28,312 | 26.3 | 54,802 | 50.8 | ND | ND | 107,785 |
| 2002 | 2,191 | 37.9 | 1,431 | 24.8 | 1,105 | 19.1 | 766 | 13.3 | 288 | 5.0 | 5,781 | 16,414 | 21.2 | 7,751 | 10.0 | 13,384 | 17.3 | 38,481 | 49.7 | 1,437 | 1.9 | 77,467 |
| 2003 | 2,996 | 49.0 | 1,318 | 21.6 | 1,066 | 17.4 | 487 | 8.0 | 246 | 4.0 | 6,113 | 15,520 | 14.9 | 9,765 | 9.4 | 25,972 | 25.0 | 50,969 | 49.1 | 1,684 | 1.6 | 103,910 |
| 2004 | 1,759 | 30.2 | 2,129 | 36.6 | 1,220 | 21.0 | 452 | 7.8 | 258 | 4.4 | 5,818 | 14,386 | 9.9 | 13,591 | 9.3 | 23,833 | 16.3 | 89,318 | 61.3 | 4,660 | 3.2 | 145,788 |
| 2005 | 1,548 | 35.9 | 934 | 21.6 | 1,243 | 28.8 | 565 | 13.1 | 26 | 0.6 | 4,316 | 13,501 | 11.4 | 9,629 | 8.1 | 27,398 | 23.0 | 62,798 | 52.8 | 5,615 | 4.7 | 118,941 |
| 2006 | 971 | 30.2 | 1,061 | 33.0 | 515 | 16.0 | 414 | 12.9 | 257 | 8.0 | 3,218 | 11,405 | 11.6 | 8,135 | 8.3 | 24,499 | 24.9 | 52,048 | 52.9 | 2,211 | 2.2 | 98,298 |
| Averages | | | | | | | | | | | | | | | | | | | | | | |
| (2002-2006) | | | | | | | | | 220 | 4.4 | | | | | | | | | | 3,120 | 2.7 | |
| (1997-2006) | 2,550 | 41.3 | 1,420 | 24.5 | 1,390 | 23.0 | 510 | 9.0 | | | 5,980 | 13,810 | 14.5 | 8,390 | 8.6 | 21,870 | 22.4 | 52,560 | 53.1 | | | 98,190 |
| (1990-2006) | | | | | | | | | | | | 12,360 | 15.6 | 7,390 | 9.2 | 19,660 | 23.9 | 42,830 | 50.5 | | | 83,160 |
| (1984-2006) | 3,320 | 35.4 | 1,690 | 19.6 | 2,910 | 26.8 | 2,080 | 17.3 | | | 10,040 | | | | | | | | | | | |

*Source:* Statewide Harvest Surveys (SWHS, Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). Harvest = fish kept (number of fish). Catch = fish harvested plus fish released. ND = no data collected.

[a] SWHS began collecting "Kenai River Reach Not Specified" data in 2002.

**Table 24.—**Fishing effort, catch, and harvest for Hidden Lake lake trout, 1977-2006.

| | Sport Fish | | |
|---|---|---|---|
| Year | Effort | Catch | Harvest |
| 1977 | 7,462 | ND | 1,542 |
| 1978 | 4,028 | ND | 850 |
| 1979 | 5,974 | ND | 1,109 |
| 1980 | 5,783 | ND | 1,860 |
| 1981 | 4,761 | ND | 1,069 |
| 1982 | 6,728 | ND | 2,117 |
| 1983 | 6,761 | ND | 1,437 |
| 1984 | 4,835 | ND | 1,047 |
| 1985 | 3,676 | ND | 1,405 |
| 1986 | 6,254 | ND | 3,761 |
| 1987 | 12,532 | ND | 1,050 |
| 1988 | 4,820 | ND | 1,183 |
| 1989 | 1,152 | ND | 619 |
| 1990 | 4,188 | 2,020 | 1,260 |
| 1991 | 4,426 | 2,302 | 1,494 |
| 1992 | 4,172 | 2,005 | 995 |
| 1993 | 5,030 | 2,358 | 1,449 |
| 1994 | 3,014 | 1,271 | 822 |
| 1995 | 4,443 | 1,103 | 852 |
| 1996 | 2,305 | 2,082 | 1,131 |
| 1997 | 2,575 | 1,091 | 524 |
| 1998 | 1,576 | 1,012 | 550 |
| 1999 | 2,017 | 1,452 | 545 |
| 2000 | 1,804 | 437 | 318 |
| 2001 | 1,604 | 734 | 160 |
| 2002 | 1,412 | 653 | 200 |
| 2003 | 1,761 | 443 | 285 |
| 2004 | 1,902 | 1,188 | 482 |
| 2005 | 1,548 | 728 | 216 |
| 2006 | 1,975 | 580 | 386 |
| Avg. (1997-2006) | 1,817 | 832 | 367 |
| Avg. (1990-2006) | | 1,262 | |
| Avg. (1977-2006) | 4,017 | | 1,024 |

*Source:* Statewide Harvest Surveys (SWHS, Mills 1979-1980, 1981 a-b, 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). Effort = participation (number of days fished). Catch = fish harvested plus fish released (number of fish). Harvest = fish kept (number of fish). ND = no data collected.

**Table 25.–**Kenai River sockeye salmon personal use dip net fishery, 1981-2006.

| | Personal Use Dip Net Fishery | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Opened | | Closed | | Total | Sockeye | Fishery | Total sockeye salmon return | |
| Year | Date (m/dd) | Time (hh:mm) | Date (m/dd) | Time (hh:mm) | days fished | salmon harvest [a] | participation (days fished) [c] | Sonar estimate [b] | Percent of total harvested |
| 1981 | No Fishery | | ND | ND | ND | ND | ND | 407,639 | ND |
| 1982 | 7/26 | 18:00 | 8/05 | 24:00 | 9.3 | Unknown | ND | 619,831 | ND |
| 1983 | 7/20 | 18:00 | 8/05 | 24:00 | 15.3 | 7,562 | 3,203 | 630,340 | 1.2 |
| 1984 | No Fishery | | ND | ND | ND | ND | ND | 344,571 | ND |
| 1985 | No Fishery | | ND | ND | ND | ND | ND | 502,820 | ND |
| 1986 | No Fishery | | ND | ND | ND | ND | ND | 501,157 | ND |
| 1987 | 7/23 | 12:00 | 8/05 | 24:00 | 13.5 | 24,086 | 22,547 | 1,596,871 | 1.5 |
| 1988 | 7/22 | 18:00 | 8/05 | 24:00 | 14.3 | 16,880 | 29,013 | 1,021,469 | 1.7 |
| 1989 | 7/21 | 00:01 | 8/05 | 24:00 | 15.0 | 48,976 | 31,312 | 1,599,959 | 3.1 |
| 1990 | No Fishery | | ND | ND | ND | ND | ND | 659,520 | ND |
| 1991 | Subsistence Fishery only | | | ND | ND | ND | ND | 647,597 | ND |
| 1992 [d] | 7/27 | 12:00 | 8/05 | 24:00 | 6.5 [e] | 12,189 | 10,371 | 994,798 | 1.2 |
| 1993 | 7/17 | 14:00 | 7/31 | 24:00 | 14.4 | 33,467 | 14,896 | 813,617 | 4.1 |
| 1994 | Subsistence Fishery only | | | ND | ND | ND | ND | 1,003,446 | ND |
| 1995 | 7/25 | 06:00 | 7/31 | 24:00 | 4.8 [e] | 14,352 | 11,122 | 630,447 | 2.3 |
| 1996 | 7/10 | 00:01 | 8/05 | 24:00 | 27.0 | 102,821 | 10,503 | 797,847 | 12.9 |
| 1997 | 7/10 | 00:01 | 7/31 | 24:00 | 22.0 | 114,619 | 11,023 | 1,064,818 | 10.8 |
| 1998 | 7/10 | 00:01 | 7/28 | 00:01 | 18.0 | 103,847 | 10,802 | 767,558 | 13.5 |
| 1999 | 7/10 | 00:01 | 7/31 | 24:00 | 22.0 | 149,504 | 13,738 | 803,379 | 18.6 |
| 2000 | 7/10 | 00:01 | 7/31 | 24:00 | 22.0 | 98,262 | 12,354 | 624,578 | 15.7 |
| 2001 | 7/10 | 00:01 | 7/31 | 24:00 | 22.0 | 150,766 | 14,722 | 650,036 | 23.2 |
| 2002 | 7/10 | 06:00 | 7/31 | 23:00 | 22.0 | 180,028 | 14,840 | 957,924 | 18.8 |
| 2003 | 7/10 | 06:00 | 7/31 | 23:00 | 22.0 | 223,580 | 15,263 | 1,181,309 | 18.9 |
| 2004 | 7/10 | 06:00 | 7/31 | 23:00 | 22.0 | 262,831 | 18,513 | 1,385,981 | 19.0 |
| 2005 | 7/10 | 06:00 | 7/31 | 23:00 | 22.0 | 295,496 | 20,977 | 1,376,452 | 21.5 |
| 2006 | 7/10 | 06:00 | 8/10 | 23:01 | 13.0 [f g] | 127,630 | 12,685 | 1,499,692 | 8.5 |

*Note:* ND = no data collected.

[a] Harvest not known in 1982; 1983-1995 from Statewide Harvest Surveys (Mills 1983-1994; Howe et al. 1995-1996). 1996-2006 reported harvest from returned permits, expanded to include permits not returned.

[b] Total sockeye salmon return estimate from ADF&G, Commercial Fisheries Division, Kenai River sonar at river mile 19.

[c] 1981-1995 are individually days fished. 1996-2006 are days fished. Each day fished may include fishing effort by more than one household member named on the household's permit.

[d] A subsistence dip net fishery also occurred in 1992.

[e] Fishery closed Wednesday and Sunday to avoid conflict with concurrent subsistence fishery. Total days reflect this closure.

[f] By Emergency Order - the personal use fishery closed on July 21 at 11:00 p.m.; it reopened on July 31 from 6:00 a.m. to 11:00 p.m.; and it reopened a final time from August 3 at 5:00 p.m. until August 10 at 11:59 p.m.. Total days reflect this closure.

[g] Fish passing the sonar during the personal use fishing closures are not included in sockeye available during the dip net fishery.

**Table 26.–**Kenai River personal use dip net fishery effort and salmon harvest , 1996-2006.

| | All Upper Cook Inlet Personal use salmon fisheries[a] | | | Kenai River Personal use dip net fishery | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Salmon harvest | | | | |
| Year | Permits issued | Permits returned | Did not fish | Effort (days fished) | Sockeye | Chinook | Coho | Pink | Chum |
| 1996 | 14,576 | 13,452 | 4,408 | 10,503 | 102,821 | 295 | 1,932 | 2,404 | 175 |
| 1997 | 14,919 | 13,756 | 6,248 | 11,023 | 114,619 | 364 | 559 | 619 | 58 |
| 1998 | 15,535 | 13,190 | 5,539 | 10,802 | 103,847 | 254 | 1,011 | 1,032 | 85 |
| 1999 | 17,197 | 14,216 | 5,643 | 13,738 | 149,504 | 488 | 1,009 | 1,666 | 102 |
| 2000 | 16,107 | 13,582 | 5,745 | 12,354 | 98,262 | 410 | 1,449 | 1,457 | 193 |
| 2001 | 16,915 | 14,398 | 3,528 | 14,772 | 150,766 | 638 | 1,555 | 1,326 | 155 |
| 2002 | 17,568 | 14,284 | 4,858 | 14,840 | 180,028 | 606 | 1,721 | 5,662 | 551 |
| 2003 | 19,110 | 15,726 | 3,576 | 15,263 | 223,580 | 1,016 | 1,332 | 1,647 | 249 |
| 2004 | 21,910 | 17,748 | 4,001 | 18,513 | 262,831 | 792 | 2,661 | 2,103 | 387 |
| 2005 | 21,905 | 19,081 | 3,839 | 20,977 | 295,496 | 997 | 2,512 | 1,806 | 321 |
| 2006 | 18,563 | 16,532 | 4,695 | 12,685 | 127,630 | 1,034 | 2,235 | 11,127 | 551 |
| Avg. (1997-2006) | 17,973 | 15,251 | 4,767 | 14,497 | 170,656 | 660 | 1,604 | 2,845 | 265 |
| Avg. (1996-2006) | 17,664 | 15,088 | 4,735 | 14,134 | 164,489 | 627 | 1,634 | 2,804 | 257 |

*Source:* 1996-2003 data (Reimer and Sigurdsson 2004). 2004-2006 data (Dunker and Lafferty *In prep*.) Effort = participation (number of days fished); Harvest = fish kept (number of fish).

[a] ADF&G issues one permit which authorizes the permittee and/or named members of his/her household to participate in any or all four Upper Cook Inlet personal use fisheries (e.g., Kenai River dip net, Kasilof River dip net, Kasilof River gill net, and Fish Creek dip net).

**Table 27.–**Kasilof River sockeye salmon personal use dip net fishery, 1981-2006.

| | Personal Use Dip Net Fishery | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Opened | | Closed | | Total | Sockeye | Fishery | Total sockeye salmon return | |
| Year | Date (m/dd) | Time (hh:mm) | Date (m/dd) | Time (hh:mm) | days fished | salmon harvest [a] | participation (days fished) [b] | Sonar estimate [c] | Percent of total harvested |
| 1981 | 7/04 | 12:00 | 7/31 | 24:00 | 27.50 | 10,300 | 5,370 | 256,625 | 4.0 |
| 1982 | 7/21 | 12:00 | 8/05 | 24:00 | 15.50 | 1,800 | 2,580 | 180,239 | 1.0 |
| 1983 | 7/15 | 24:00 | 8/05 | 24:00 | 21.00 | 11,124 | 4,417 | 210,271 | 5.3 |
| 1984 | 7/16 | 12:00 | 8/05 | 24:00 | 20.50 | 12,771 | 5,956 | 231,685 | 5.5 |
| 1985 | 7/15 | 18:00 | 8/05 | 24:00 | 21.25 | 16,284 | 9,260 | 505,049 | 3.2 |
| 1986 | 7/15 | 06:00 | 8/05 | 24:00 | 21.75 | 38,674 | 13,929 | 275,963 | 14.0 |
| 1987 [d] | 7/10 | 12:00 | 8/05 | 24:00 | 25.50 | 18,454 | 8,910 | 249,250 | 7.4 |
| 1988 | 7/22 | 18:00 | 8/05 | 24:00 | 14.25 | 3,547 | 6,930 | 204,000 | 1.7 |
| 1989 | No Fishery | | ND | ND | ND | ND | ND | 158,206 | ND |
| 1990 | No Fishery | | ND | ND | ND | ND | ND | 144,136 | ND |
| 1991 | Subsistence Fishery | | | ND | ND | ND | ND | 238,269 | ND |
| 1992 | Subsistence Fishery | | | ND | ND | ND | ND | 184,178 | ND |
| 1993 | No Fishery | | ND | ND | ND | ND | ND | 149,939 | ND |
| 1994 | 7/22 | 12:00 | 8/05 | 23:59 | 10.50 [e] | 3,679 | 2,361 | 205,117 | 1.8 |
| 1995 | 7/17 | 18:00 | 7/31 | 24:00 | 10.25 [e] | 4,160 | 2,845 | 204,935 | 2.0 |
| 1996 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 11,197 | 1,300 | 249,944 | 4.5 |
| 1997 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 9,737 | 1,091 | 266,025 | 3.7 |
| 1998 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 45,161 | 3,421 | 273,213 | 16.5 |
| 1999 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 37,176 | 3,611 | 312,587 | 11.9 |
| 2000 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 23,877 | 2,622 | 256,053 | 9.3 |
| 2001 | 7/10 | 00:01 | 8/05 | 24:00 | 27.00 | 37,612 | 3,382 | 307,570 | 12.2 |
| 2002 | 6/25 | 00:01 | 8/07 | 24:00 | 44.00 | 46,769 | 4,020 | 226,682 | 20.6 |
| 2003 | 6/25 | 00:01 | 8/07 | 24:00 | 44.00 | 43,870 | 3,874 | 359,633 | 12.2 |
| 2004 | 6/25 | 00:01 | 8/07 | 24:00 | 44.00 | 48,315 | 4,432 | 577,581 | 8.4 |
| 2005 | 6/25 | 00:01 | 8/07 | 24:00 | 44.00 | 43,151 | 4,500 | 348,012 | 12.4 |
| 2006 | 6/25 | 00:02 | 8/07 | 24:01 | 44.00 | 56,144 | 5,763 | 368,092 | 15.3 |
| | | | | | Averages | | | | |
| (1997-2006) | | | | | 35.50 | 39,181 | 3,672 | 329,545 | 12.2 |
| (1994-2006) | | | | | 30.98 | 31,604 | 3,325 | 304,265 | 10.1 |
| (1981-2006) | | | | | 27.14 | 24,943 | 4,789 | 267,050 | 8.2 |

Note: ND = no data collected.

[a] Harvest participation during first 2 years of fishery are field creel survey estimates. 1983-1995 data are from Statewide Harvest Surveys (Mills 1983-1994; Howe et al. 1995-1996). 1996-2006 total reported harvest from returned permits, expanded to include permits not returned.

[b] 1981-1995 are individual days fished. 1996-2006 are days fished. Each day fished may include fishing effort by more than one household member named on the household's permit.

[c] Total sockeye salmon return estimate from ADF&G, Commercial Fisheries Division, Kasilof River sonar at river mile 8.

[d] The fishery was closed from July 14 at 6:00 a.m. to July 15 at 6:00 p.m. as a precautionary measure due to possible oil contamination.

[e] Fishery closed on Wednesday and Sunday due to subsistence/personal use permit fishery. Total days reflect this closure.

**Table 28.–**Kasilof River personal use dip net fishery effort and salmon harvest, 1996-2006.

| | All Upper Cook Inlet Personal use salmon fisheries[a] | | | Kasilof River Personal use dip net fishery | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Permits | Permits | Did not | Effort | Salmon harvest | | | | |
| Year | issued | returned | fish | (days fished) | Sockeye | Chinook | Coho | Pink | Chum |
| 1996 | 14,576 | 13,452 | 4,408 | 1,300 | 11,197 | 50 | 334 | 103 | 17 |
| 1997 | 14,919 | 13,756 | 6,248 | 1,091 | 9,737 | 35 | 90 | 19 | 19 |
| 1998 | 15,535 | 13,190 | 5,539 | 3,421 | 45,161 | 134 | 731 | 610 | 74 |
| 1999 | 17,197 | 14,216 | 5,643 | 3,611 | 37,176 | 127 | 286 | 264 | 52 |
| 2000 | 16,107 | 13,582 | 5,745 | 2,622 | 23,877 | 134 | 1,004 | 841 | 34 |
| 2001 | 16,915 | 14,398 | 3,528 | 3,382 | 37,612 | 138 | 766 | 307 | 23 |
| 2002 | 17,568 | 14,284 | 4,858 | 4,020 | 46,769 | 106 | 1,197 | 1,862 | 139 |
| 2003 | 19,110 | 15,726 | 3,576 | 3,874 | 43,870 | 57 | 592 | 286 | 30 |
| 2004 | 21,910 | 17,748 | 4,001 | 4,432 | 48,315 | 44 | 668 | 396 | 90 |
| 2005 | 21,905 | 19,081 | 3,839 | 4,500 | 43,151 | 16 | 538 | 658 | 102 |
| 2006 | 18,563 | 16,532 | 4,695 | 5,763 | 56,144 | 55 | 1,057 | 992 | 105 |
| Avg. (1996-2006) | 17,664 | 15,088 | 4,735 | 3,456 | 36,637 | 81 | 660 | 576 | 62 |

*Source:* 1996-2003 (Reimer and Sigurdsson 2004). 2004-2006 (Dunker and Lafferty *In prep*.)

Effort = participation (number of days fished); Harvest = fish kept (number of fish).

[a] ADF&G issues one permit which authorizes the permittee and/or named members of his/her household to participate in any or all four Upper Cook Inlet personal use fisheries (e.g., Kenai River dip net, Kasilof River dip net, Kasilof River gill net, and Fish Creek dip net).

**Table 29.–**Kenai Peninsula northern pike harvest, 1981-2006.

| | Sport Fish Harvest | | |
|---|---|---|---|
| Year | Kenai Peninsula Lakes | Kenai River | Total |
| 1981 | 32 | ND | 32 |
| 1982 | 105 | ND | 105 |
| 1983 | 294 | ND | 294 |
| 1984 | 187 | ND | 187 |
| 1985 | 52 | 69 | 121 |
| 1986 | 0 | 0 | 0 |
| 1987 | 0 | 12 | 12 |
| 1988 | 36 | 0 | 36 |
| 1989 | 49 | 18 | 67 |
| 1990 | 30 | 10 | 40 |
| 1991 | 86 | 0 | 86 |
| 1992 | 239 | 0 | 239 |
| 1993 | 216 | 26 | 242 |
| 1994 | 36 | 0 | 36 |
| 1995 | 219 | 29 | 248 |
| 1996 | 32 | 92 | 124 |
| 1997 | 21 | 7 | 28 |
| 1998 | 114 | 0 | 114 |
| 1999 | 329 | 0 | 329 |
| 2000 | 153 | 6 | 159 |
| 2001 | 1,288 | 0 | 1,288 |
| 2002 | 368 | 12 | 380 |
| 2003 | 641 | 58 | 699 |
| 2004 | 2,263 [a] | 58 | 2,321 |
| 2005 | 212 | 12 | 224 |
| 2006 | 55 | 0 | 55 |
| Avg. (1997-2006) | 544 | 15 | 560 |
| Avg. (1985-2006) | | 19 | |
| Avg. (1981-2006) | 271 | | 287 |

*Source:* Statewide Harvest Surveys (Mills 1982-1994; Howe et al. 1995, 1996, 2001 a-d; Walker et al. 2003; Jennings et al. 2007, *In prep.;* Jennings et al. 2004; 2006 a-b; G.B. Jennings, Sport Fish Program Coordinator, ADF&G, Anchorage; personal communication). Harvest = fish kept (number of fish). ND = no data collected.

[a] The 2004 harvest may be inflated due to one large angler report.

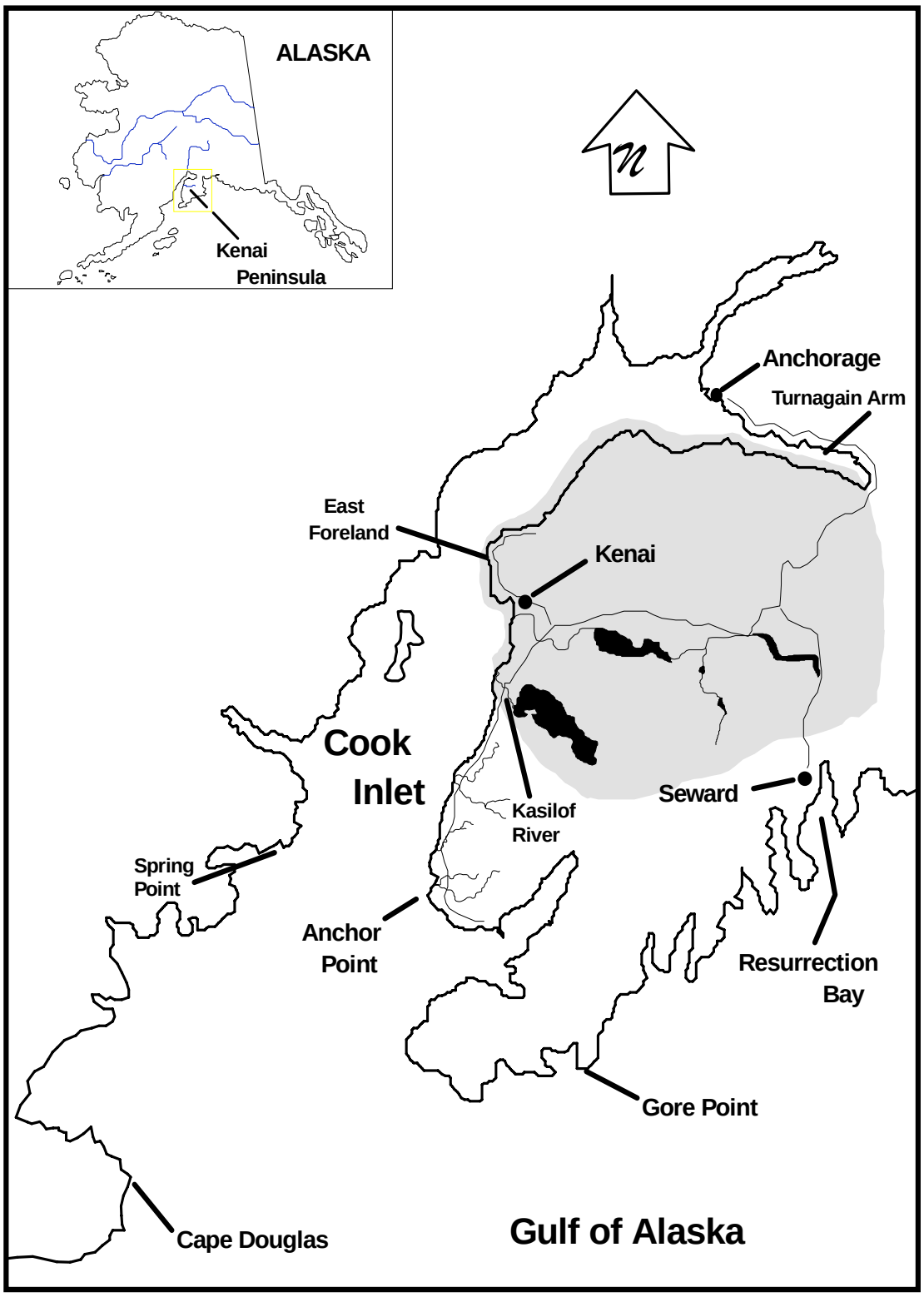


**Figure 1.**—The Northern Kenai Peninsula Management Area (shaded) includes all freshwater drainages and saltwater fisheries from the Kasilof River north to Turnagain Arm on the Kenai Peninsula.

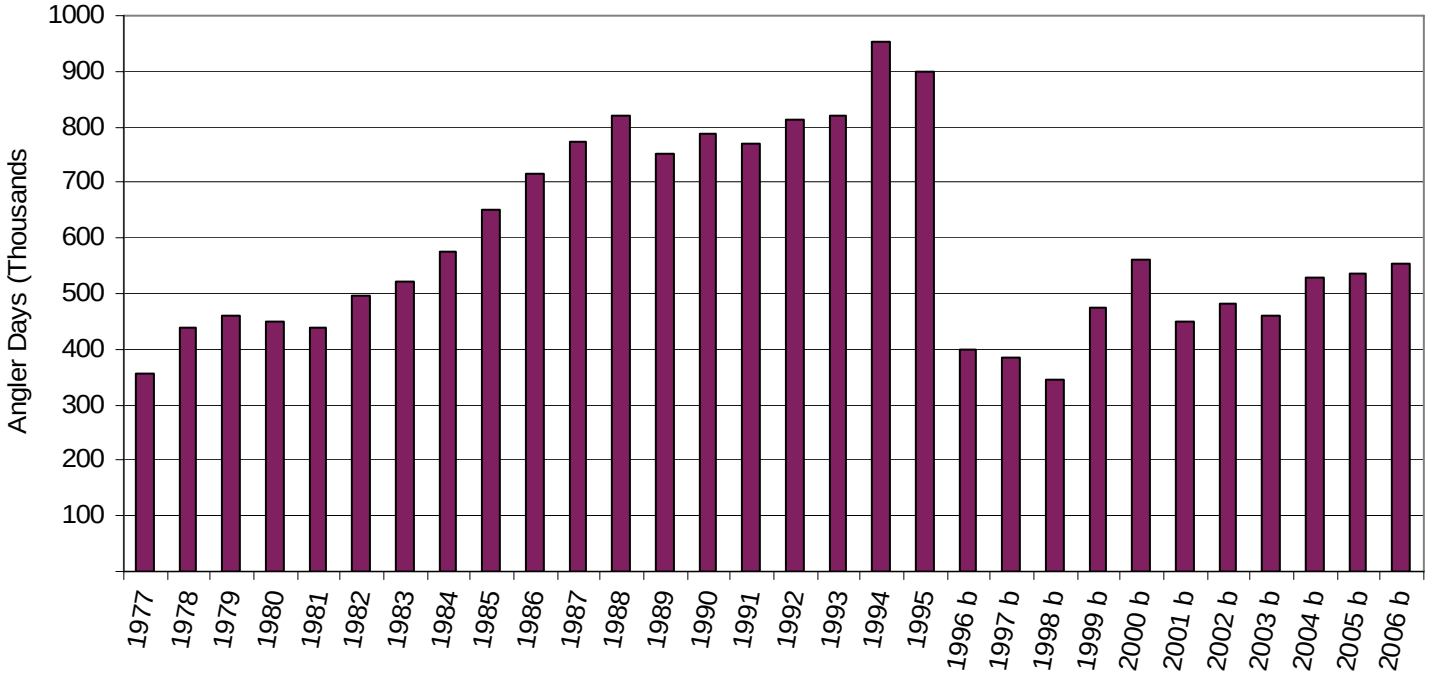


**Figure 2.–**Recreational angler participation in the Kenai Peninsula Management Area, 1977-2006.

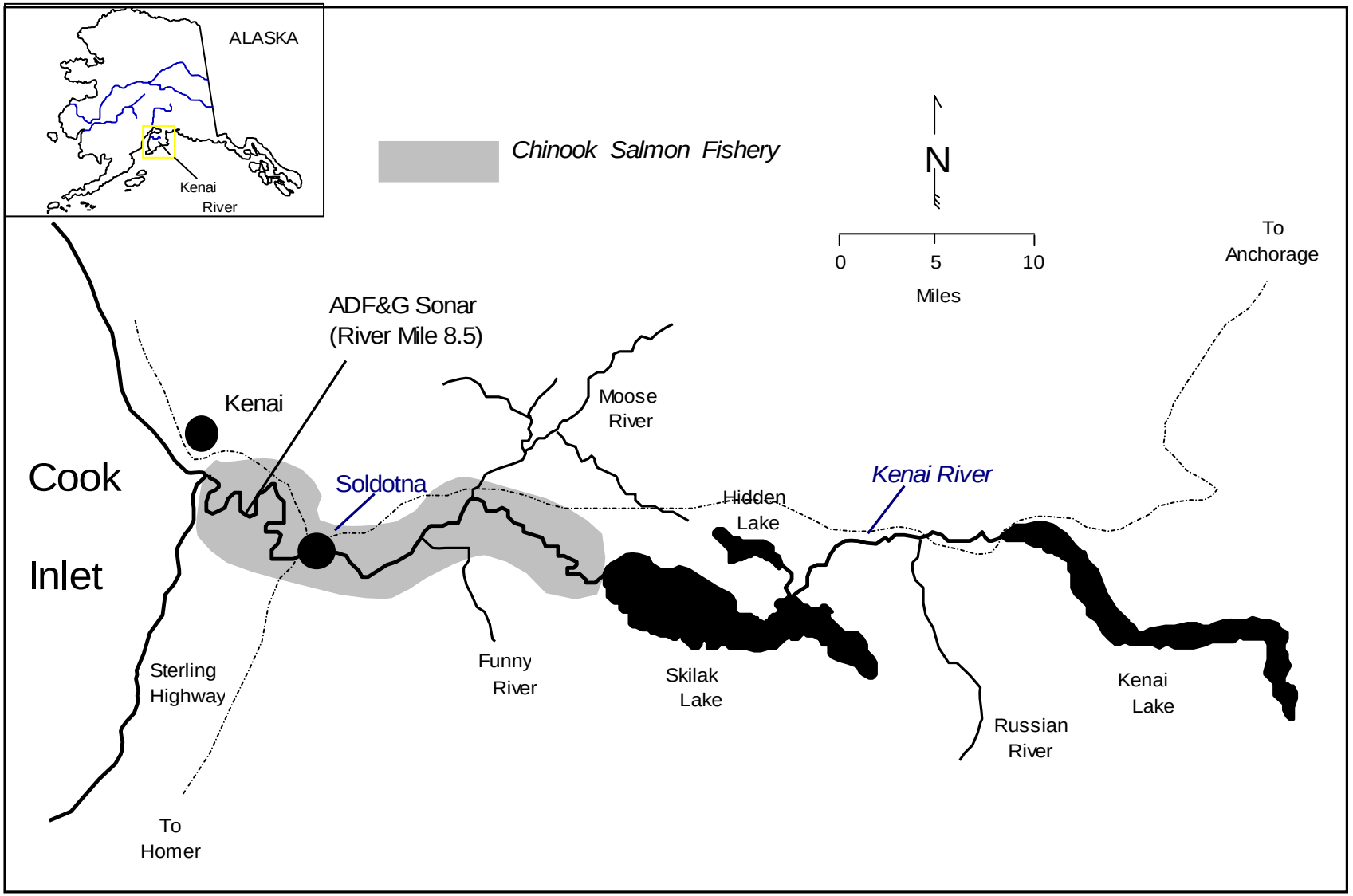


**Figure 3.**—Kenai River Chinook salmon fishery.

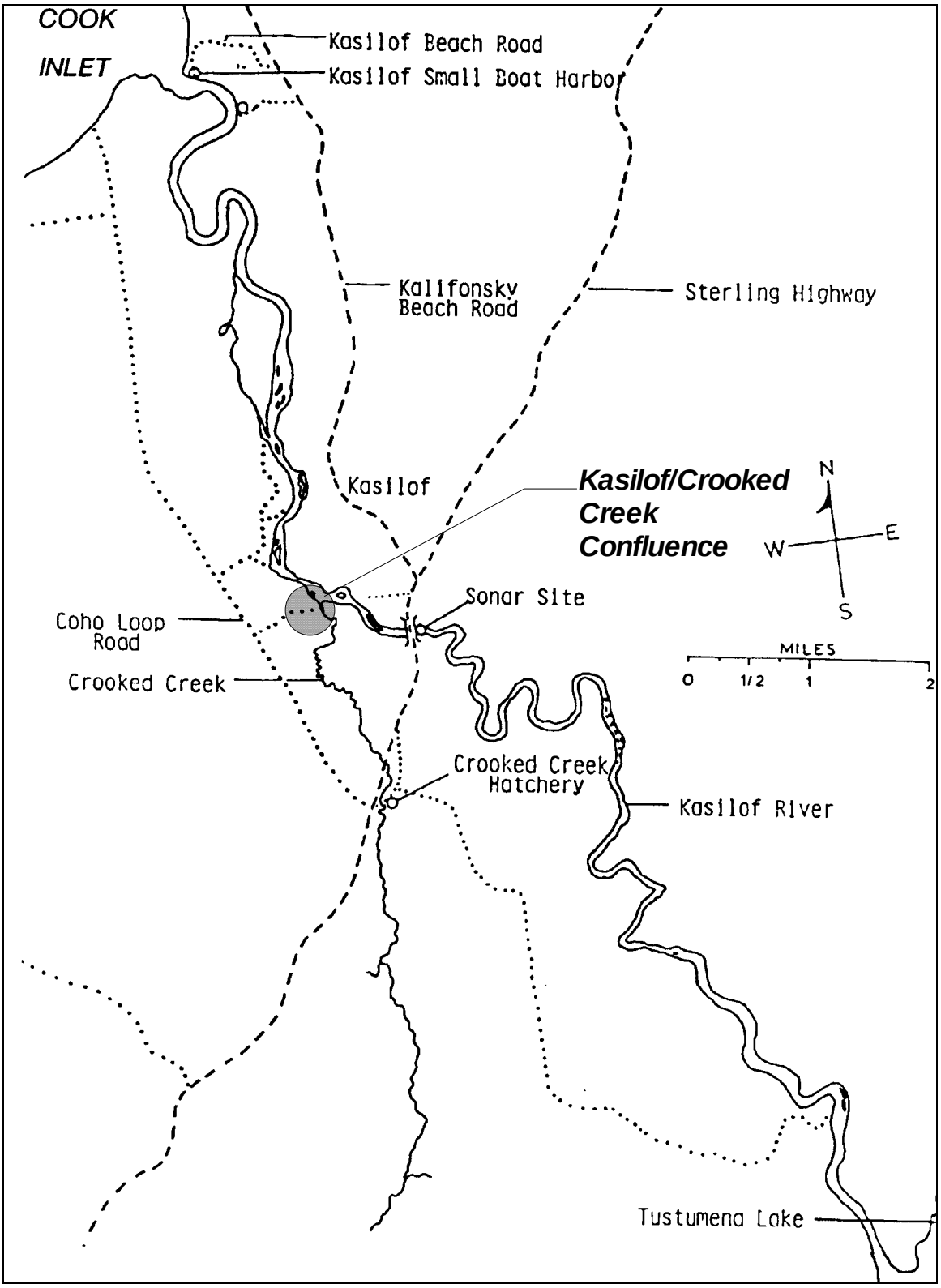


**Figure 4.**—Kasilof River Chinook salmon fishery.

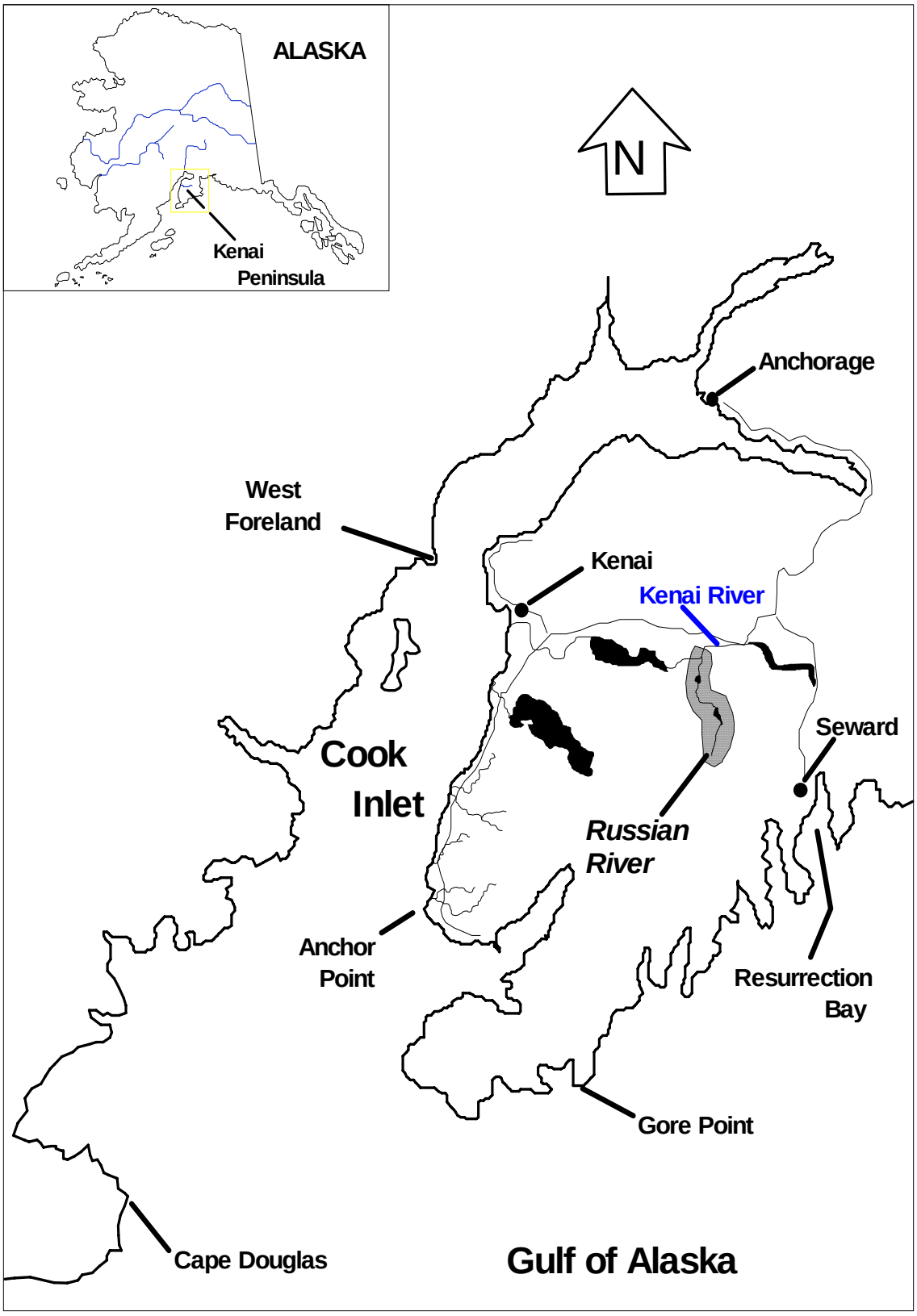


**Figure 5.—**Location of Russian River on the Kenai Peninsula, Alaska.

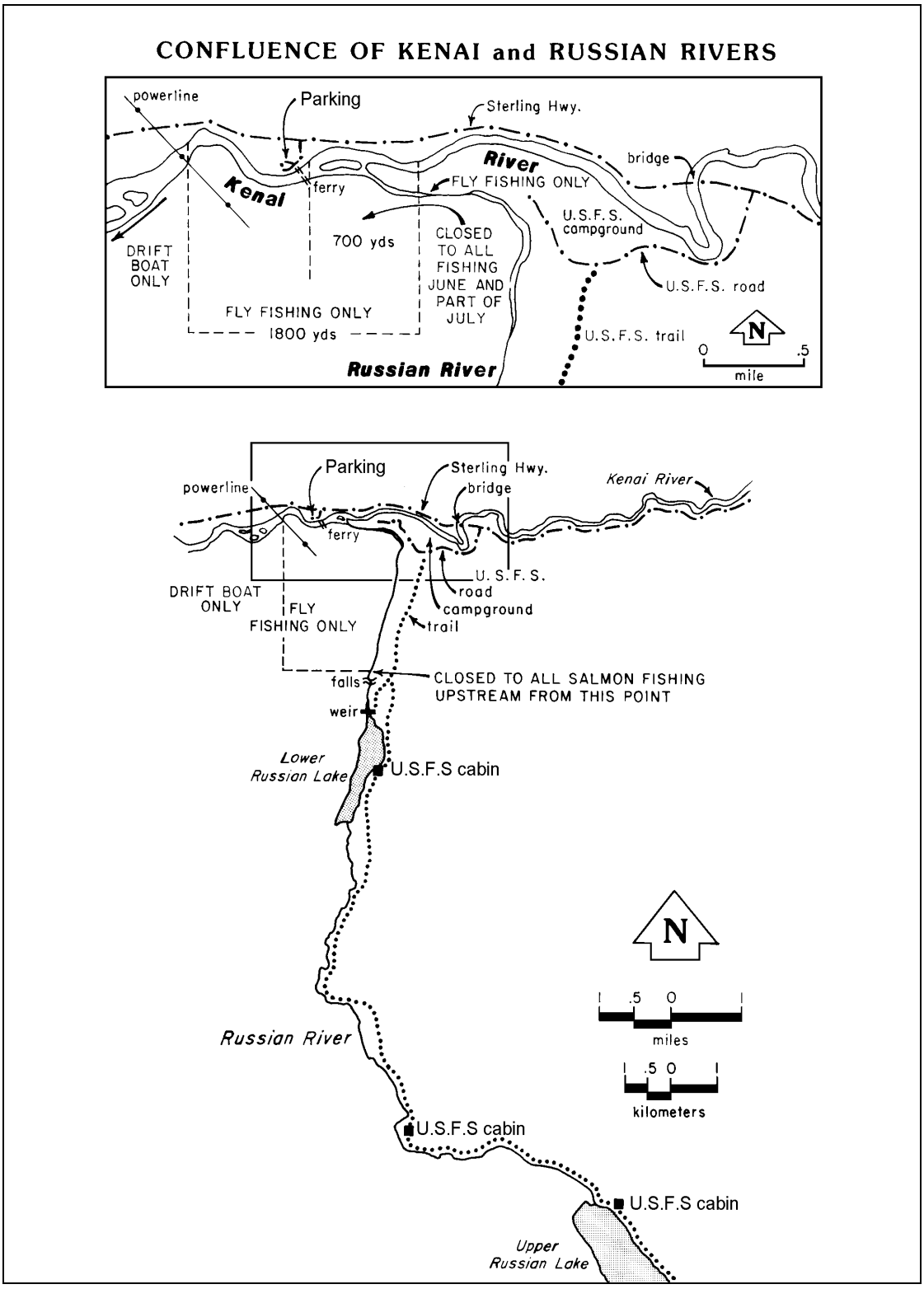


**Figure 6.**—Map of Russian River drainage.

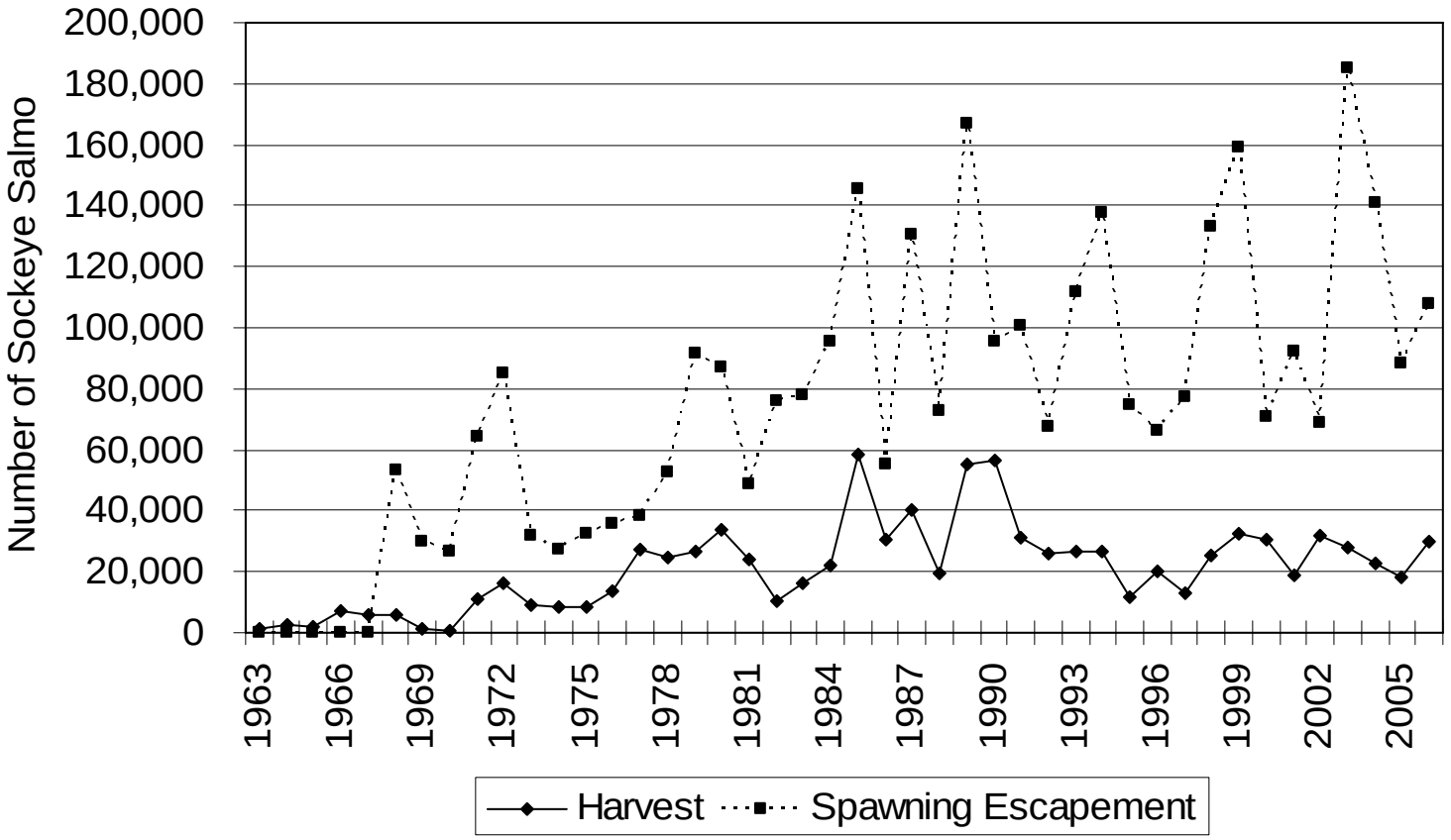


**Figure 7.**—Late-run Russian River sockeye salmon harvest and total spawning escapement, including lower river spawners, 1968-2006.

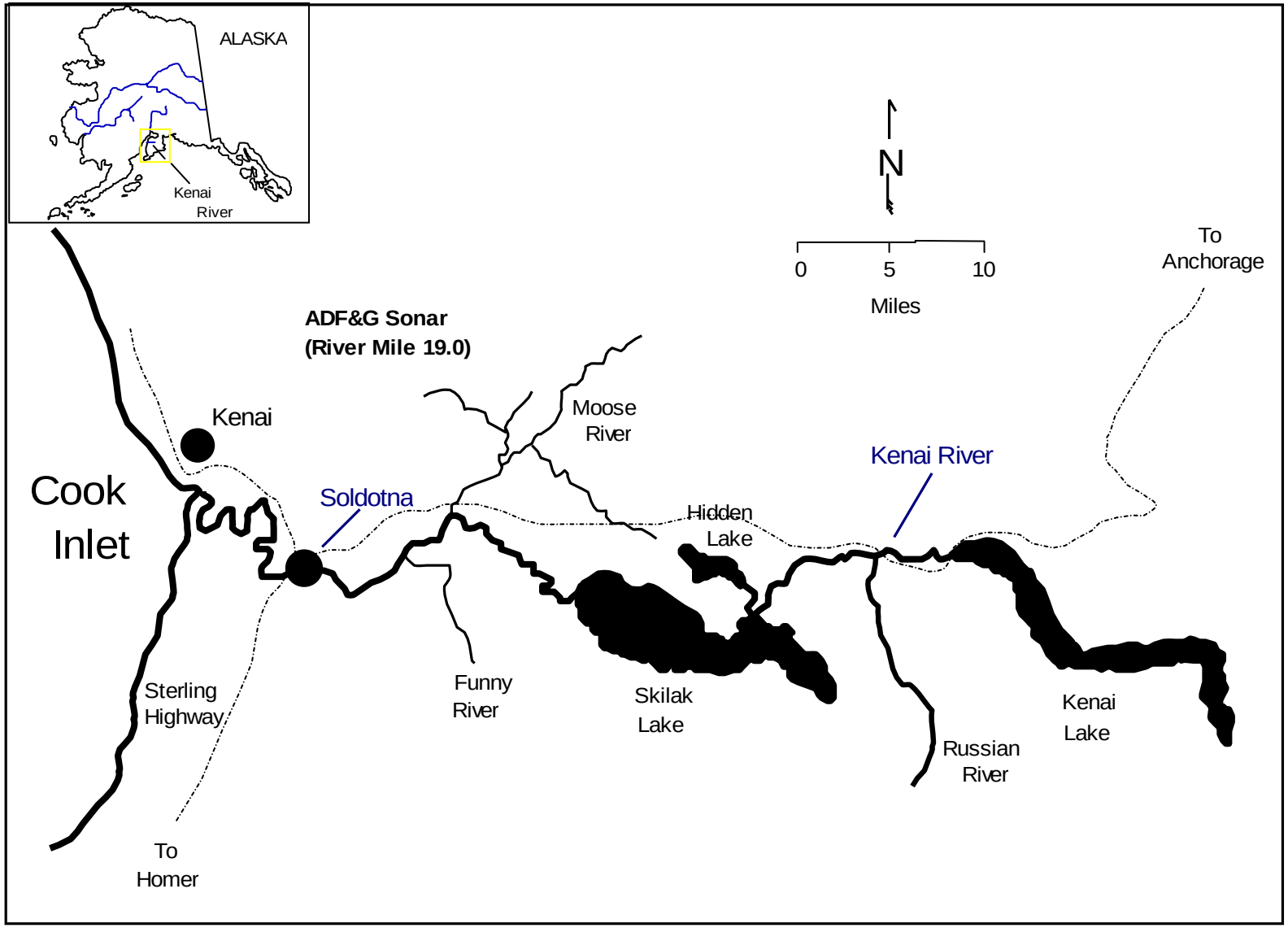


**Figure 8.—**Map of the Kenai River drainage. Late-run sockeye salmon fishery occurs from Cook Inlet to Kenai Lake.

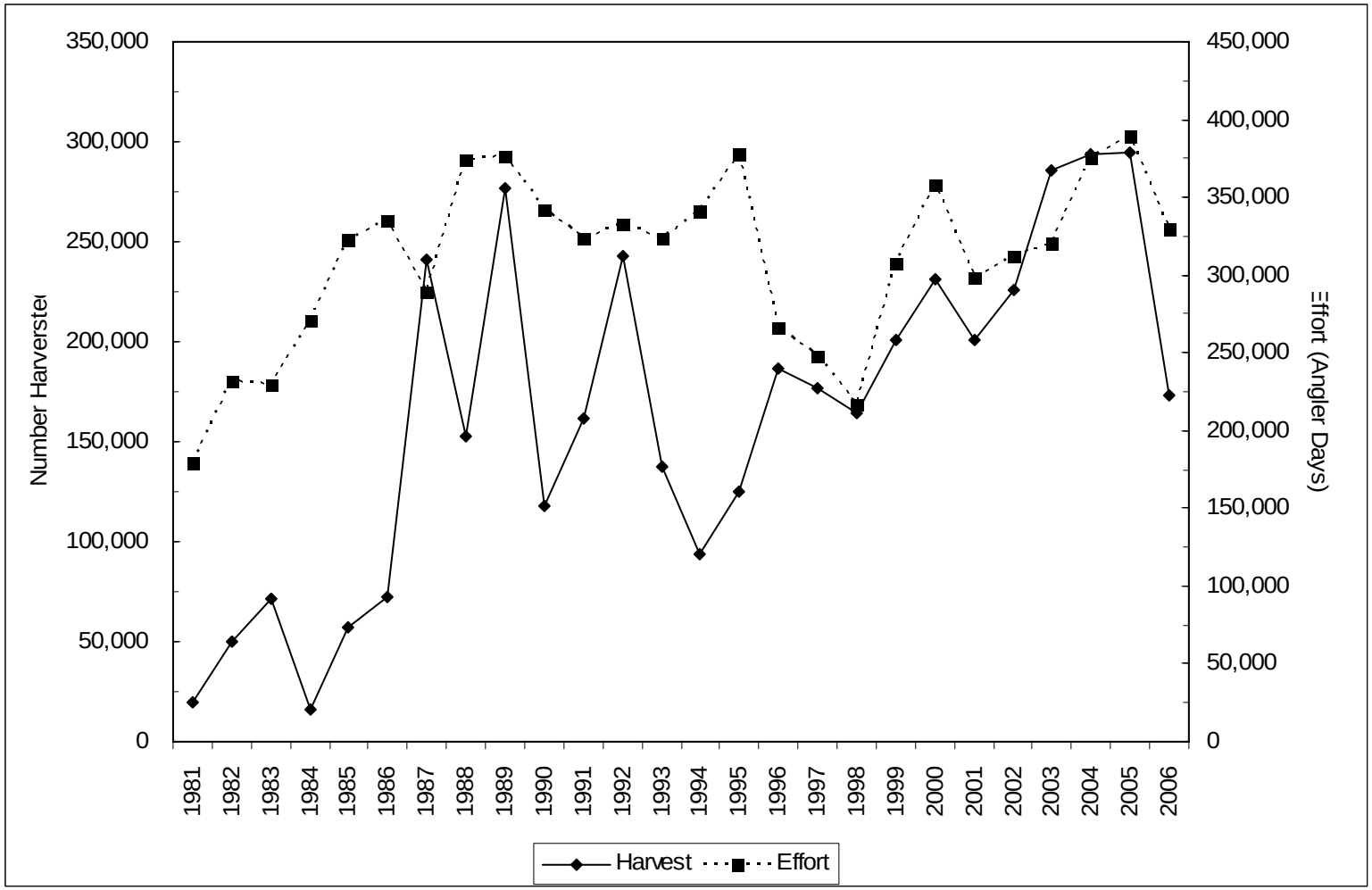


**Figure 9.–**Total harvest of sockeye salmon and angler effort directed toward all species, Kenai River, 1981-2006.

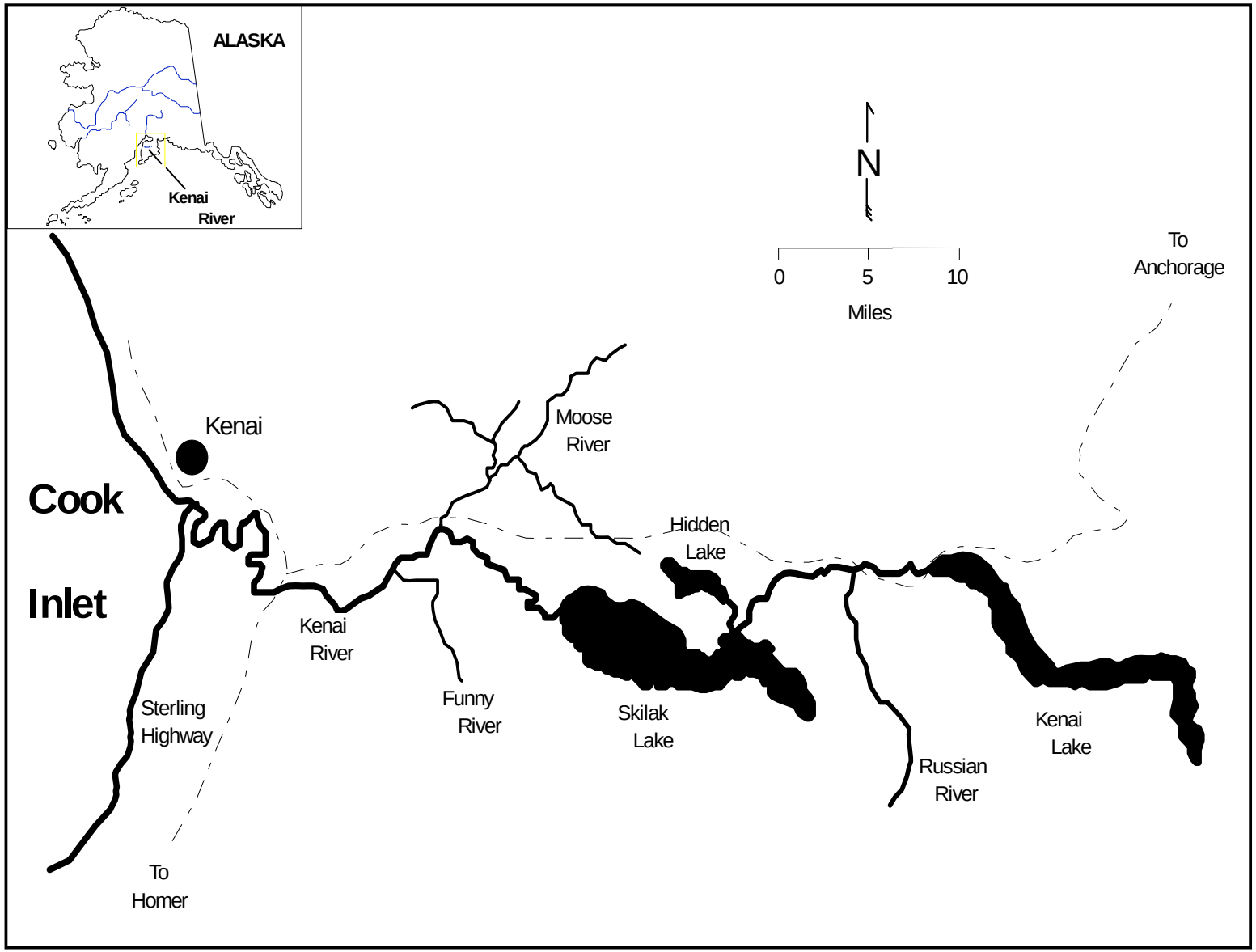


**Figure 10.—**Map of Kenai River drainage.

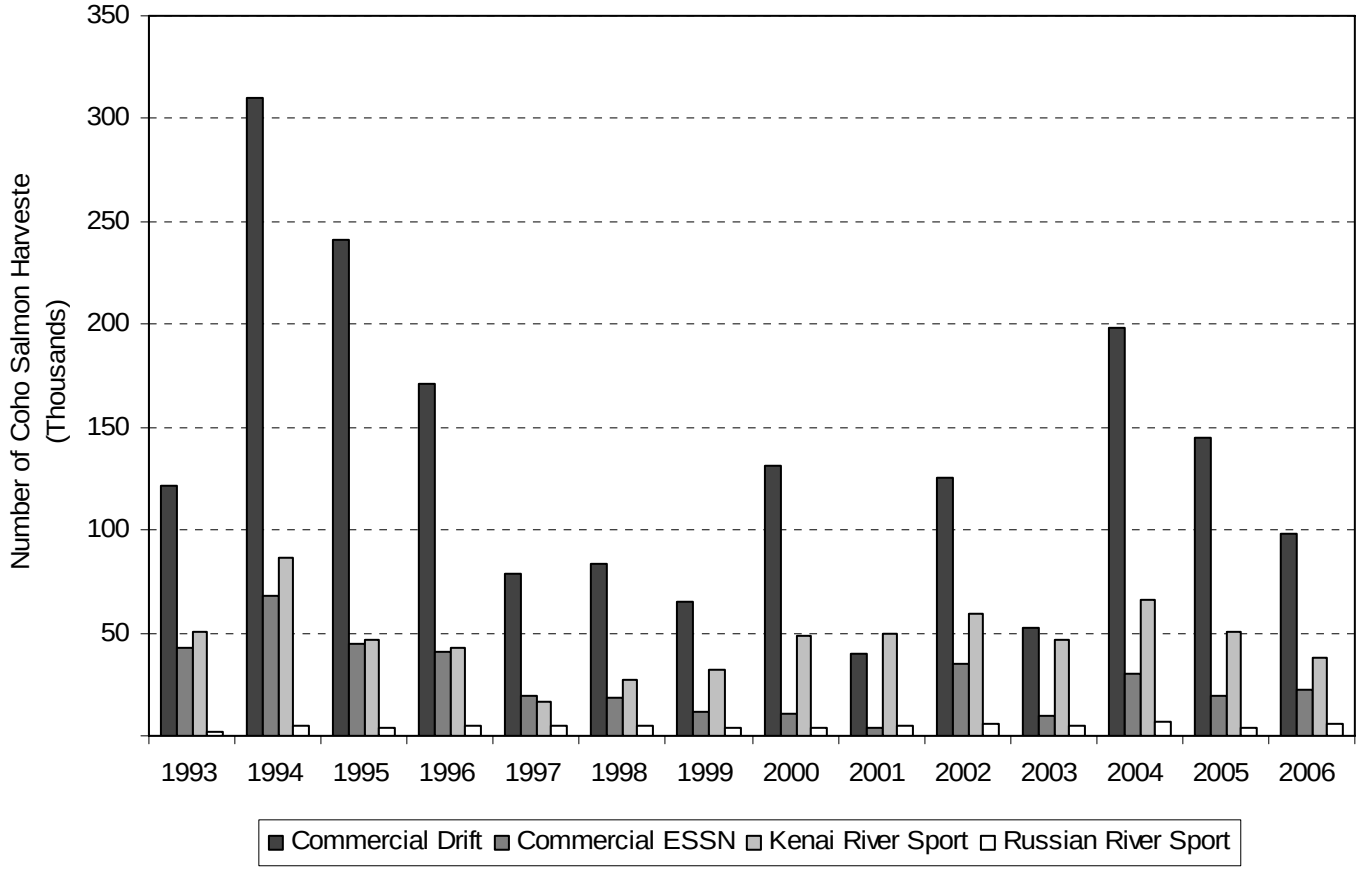


**Figure 11.–**Cook Inlet commercial coho salmon harvest and harvest of Kenai River coho salmon, 1993-2006.

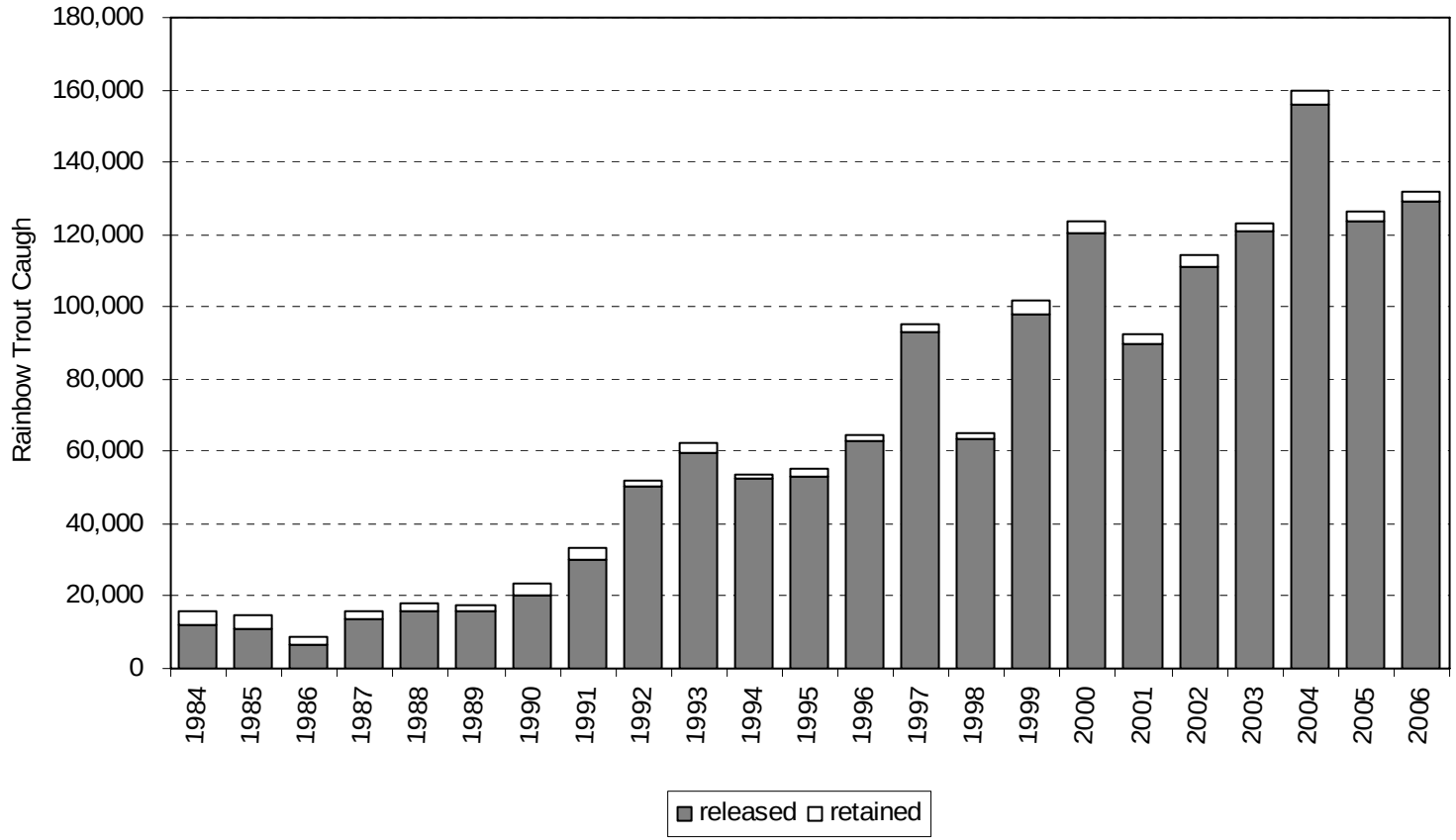


**Figure 12.–**Total number of rainbow trout caught, showing number released and number retained, Kenai River sport fishery, 1984-2006.

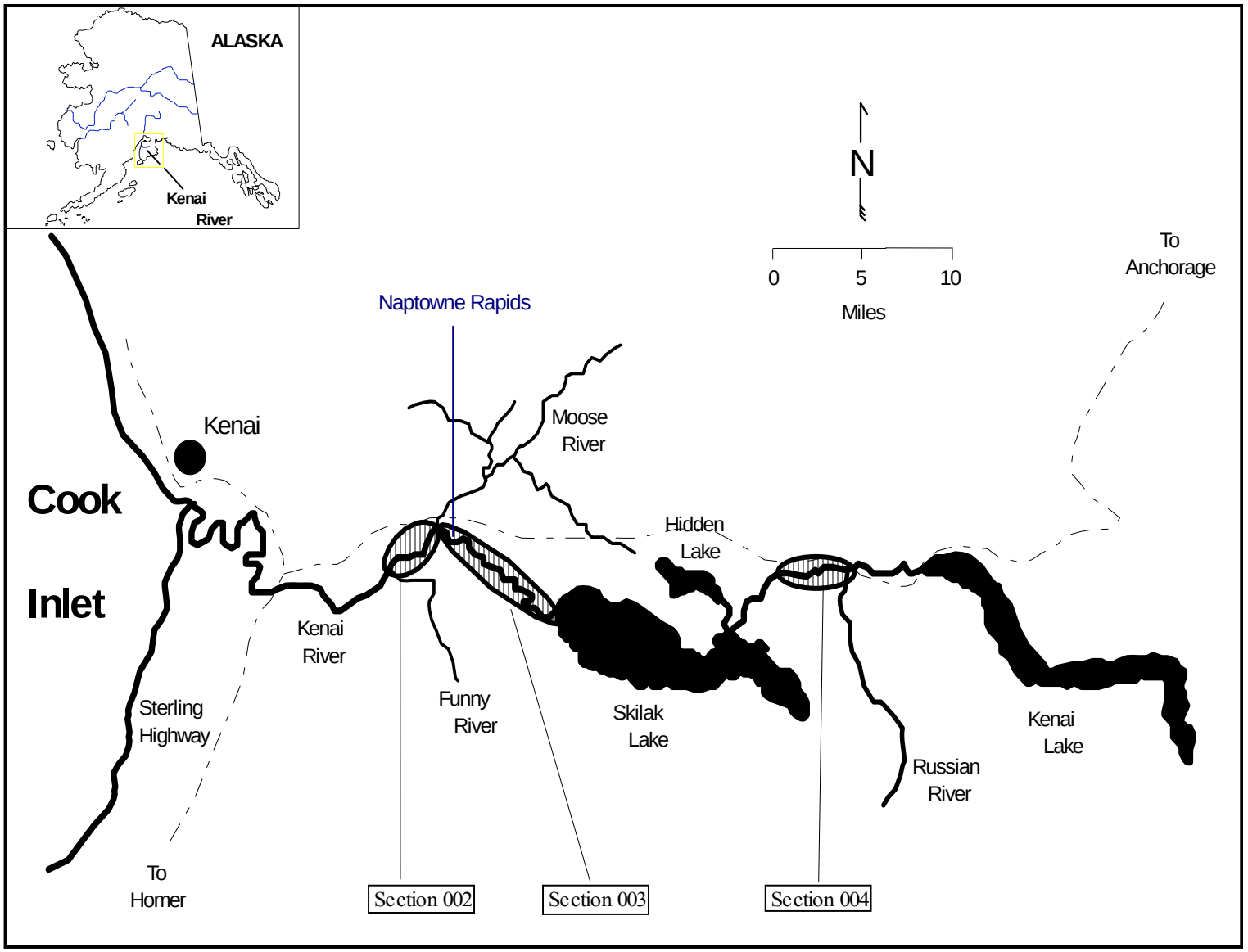


**Figure 13.—**Map of rainbow trout study areas in Kenai River drainage.

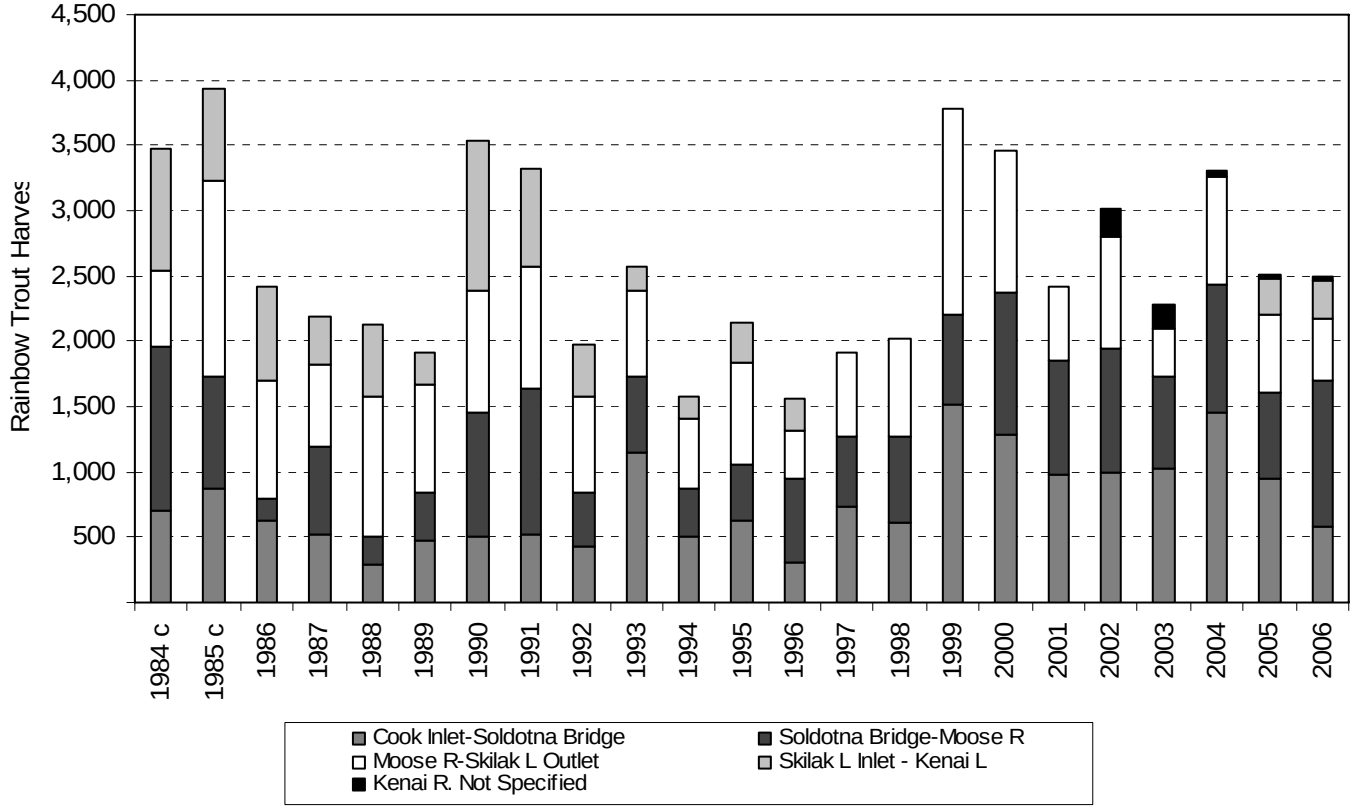


**Figure 14.–**Number of rainbow trout retained by river section, Kenai River sport fishery, 1984-2006.

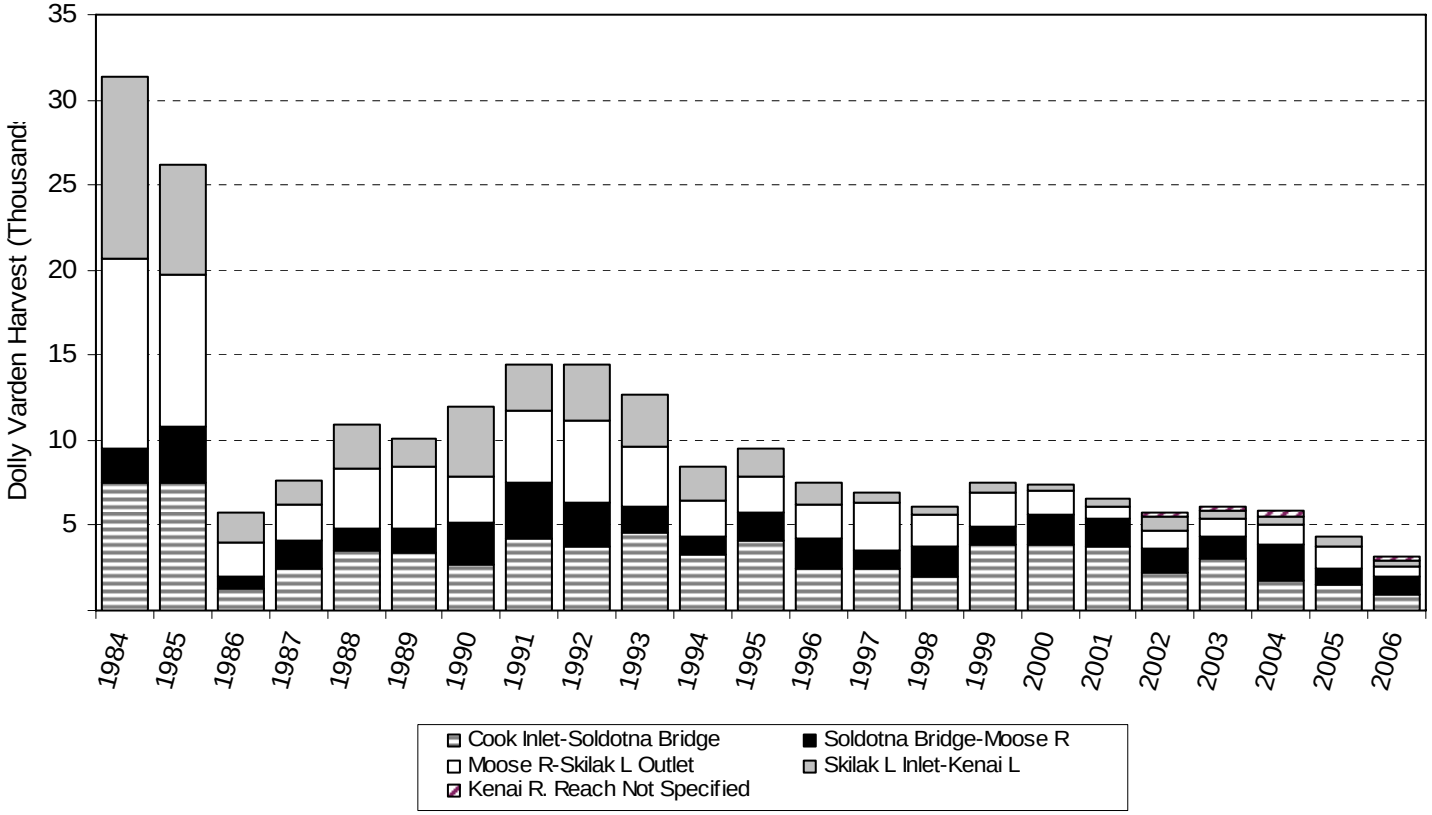


**Figure 15.–**Dolly Varden harvest by river section, Kenai River sport fishery, 1984-2006.

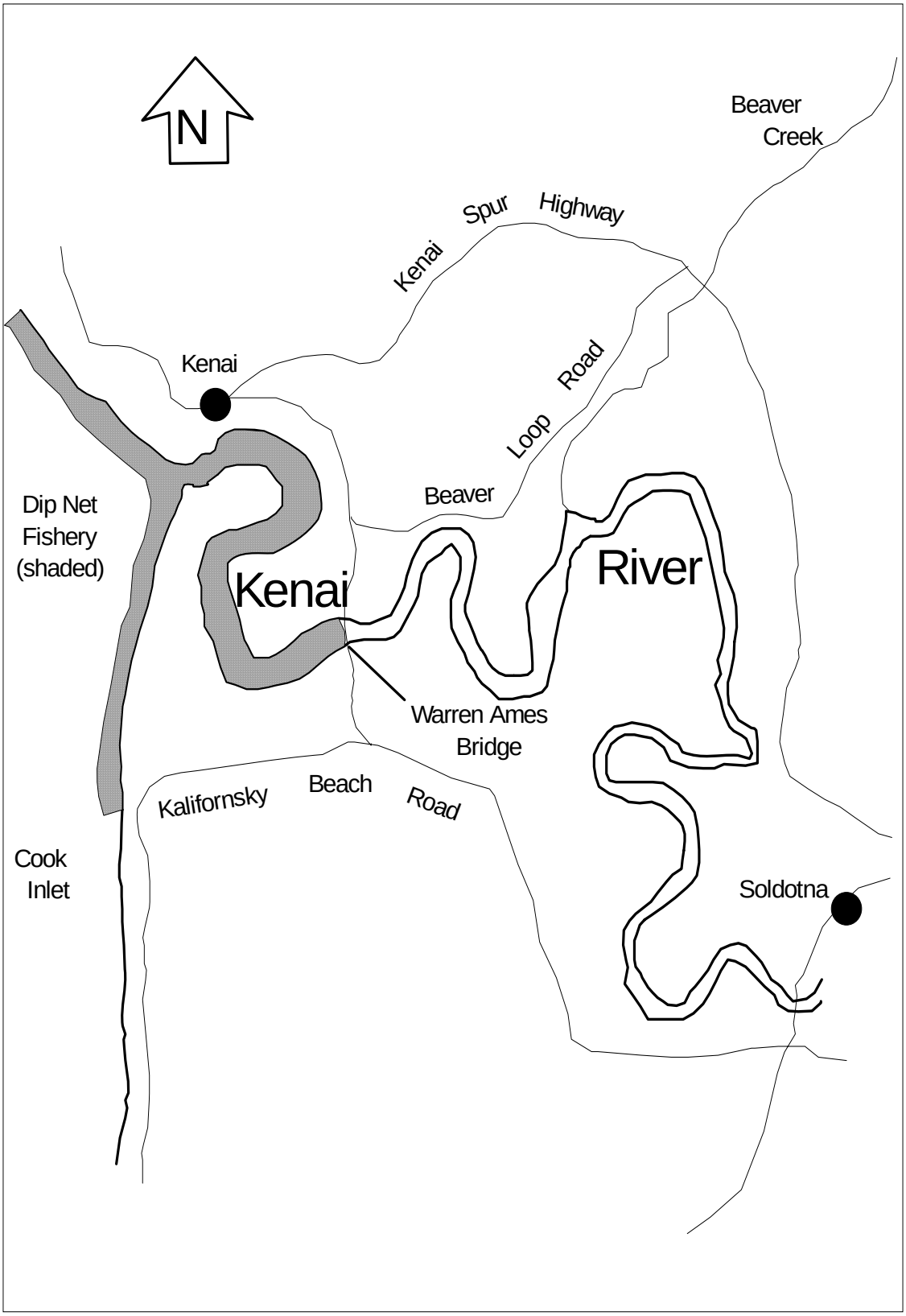


**Figure 16.–**Map of the Kenai River sockeye salmon dip net fishery.

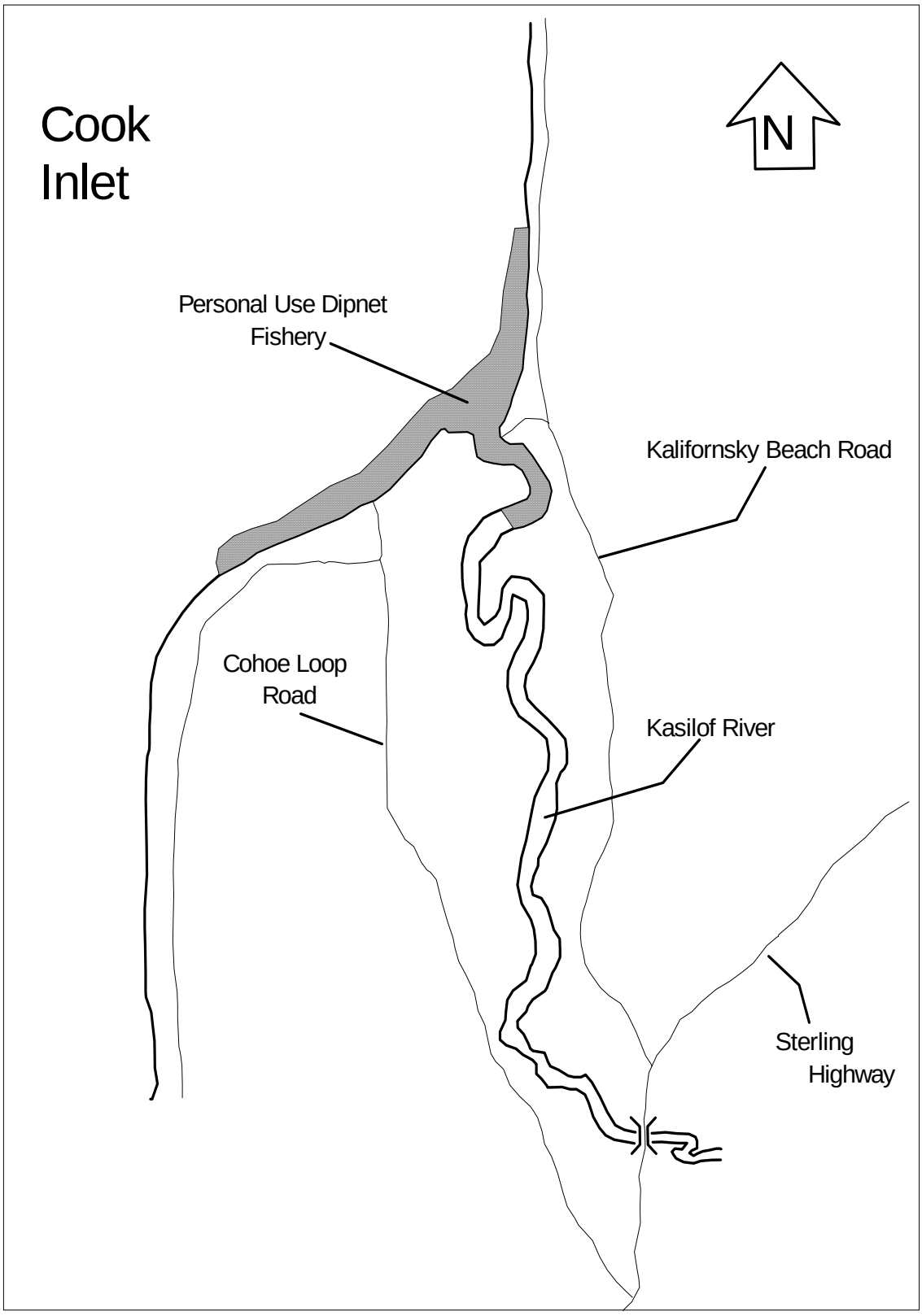


**Figure 17.–**Map of the Kasilof River personal use sockeye salmon dip net fishery.

# APPENDIX A. EMERGENCY ORDERS

**Appendix A1.**—Emergency orders issued for Northern Kenai Peninsula Management Area waters in 2005.

| Emergency Order Number | Effective Date | Action/Justification |
|---|---|---|
| 2-KS-1-01-05 | 5/1/2005 12:01 a.m. | Kenai River king salmon cannot be filleted before fish are brought to shore and offloaded from a vessel or removed from the shore fishing site. |
| 2-RS-1-08-05 | 6/16/2005 6:00 a.m. | Open sanctuary at Russian River. |
| 2-KS-1-10-05 | 6/18/2005 12:01 a.m. | Bait allowed on the Kenai River downstream of the Moose River. |
| 2-S-1-05 | 6/25/2005 6:00 a.m. | Kasilof River personal use set gillnet open season extended by one day. |
| 2-RS-1-14-05 | 6/25/2005 6:00 a.m. | Sockeye salmon daily bag limit increased to 4 per day in the Russian River and the Russian/Kenai River "Fly-Fishing-Only-Waters". |
| 2-RS-1-13-05 | 6/25/2005 12:01 a.m. | Increases rod-and-reel limits for salmon (other than king salmon) on the Kasilof River to 6 per day. |
| 2-RS-1-12-05 | 6/25/2005 12:01 a.m. | Kasilof River personal use dipnetting area extended up to the Sterling Highway Bridge. |
| 2-RS-1-18-05 | 7/7/2005 12:01 a.m. | Close additional Kenai River bank areas to shore-based fishing. |
| 2-RS-1-25-05 | 7/19/2005 11:01 p.m. | Personal use fishery hours increased on the Kenai River. |
| 2-RS-1-24-05 | 7/20/2005 12:01 a.m. | Increases rod-and-reel limits for salmon (other than king salmon) on the Kenai River to 6 per day. |
| 2-RS-1-28-05 | 8/21/2005 12:01 a.m. | Sockeye salmon season extended, and bag limit increased for a portion of the Upper Kenai River "fly-fishing-only" area. |

**Appendix A2.**—Emergency orders issued for Northern Kenai Peninsula Management Area waters in 2006.

| Emergency Order Number | Effective Date | Action/Justification |
|---|---|---|
| 2-NP-1-01-06 | 1/1/2006 12:01 a.m. | Adds Scout Lake to the list of lakes on the Kenai Peninsula in which five lines may be used to fish for northern pike through the ice. |
| 2-RT-1-03-06 | 4/21/2006 12:01 a.m. | Prohibits the removal of rainbow/steelhead trout from the water during the closed fishing season in flowing waters of the Kenai River to Skilak Lake. |
| 2-KS-1-04-06 | 5/1/2006 12:01 a.m. | Prohibits the filleting, heading, mutilation or disfigurement of king salmon in a manner that would prevent the determination of length. |
| 2-KS-1-05-06 | 5/18/2006 12:01 a.m. | Adds Thursdays as an additional day anglers may retain naturally-produced king salmon from the Kasilof River. |
| 2-KS-1-10-06 | 6/10/2006 12:01 a.m. | Allows the use of bait in the flowing waters of the Kenai River drainage open to fishing for king salmon. |
| 2-RS-1-13-06 | 6/21/2006 6:00 a.m. | Opens the Russian River Sanctuary Area to fishing for sockeye salmon. |
| 2-RS-1-16-06 | 6/25/2006 6:00 a.m. | Sockeye salmon daily bag limit increased to 4 per day in the Russian River and the Russian/Kenai River "Fly-Fishing-Only-Waters". |
| 2-RS-1-20-06 | 7/8/2006 12:01 a.m. | Increases rod-and-reel limits for salmon (other than king salmon) on the Kasilof River to 6 per day. |
| 2-RS-1-19-06 | 7/8/2006 12:01 a.m. | Kasilof River personal use dip netting area extended up to the Sterling Highway Bridge. |
| 2-RS-1-28-06 | 7/22/2006 12:01 a.m. | Closes the Kenaitze Indian Tribe educational fishery authorized for the Kenai River. |
| 2-RS-1-27-06 | 7/22/2006 12:01 a.m. | Sockeye salmon daily bag limit reduced to 1 per day in all portions of the Kenai River except the Upper Kenai River "fly-fishing-only" area. |
| 2-RS-1-26-06 | 7/21/2006 11:00 p.m. | Closes the personal use salmon fishery at the mouth of the Kenai River. |
| 2-RS-1-31-06 | 7/25/2006 12:01 a.m. | Closes the sport fishery for sockeye salmon in all portions of the Kenai River except the Upper Kenai River "fly-fishing-only" area. |
| 2-RS-1-35-06 | 7/31/2006 6:00 a.m. | Reopens the Kenaitze Indian Tribe educational fishery authorized for the Kenai River. |
| 2-RS-1-34-06 | 7/31/2006 6:00 a.m. | Reopens the personal use salmon fishery at the mouth of the Kenai River. |
| 2-RS-1-33-06 | 7/31/2006 6:00 a.m. | Reopens the sport fishery for sockeye salmon in all waters of the Kenai River open to salmon fishing and returns the bag limit to 3 fish per day. |
| 2-RS-1-36-06 | 8/3/2006 12:01 a.m. | Increases the daily bag limit for salmon (other than king salmon) on the Kasilof River to 6 per day. |
| 2-RS-1-38-06 | 8/3/2006 5:00 p.m. | Reopens the personal use salmon fishery at the mouth of the Kenai River. |
| 2-RS-1-39-06 | 8/7/2006 6:00 p.m. | Increases the daily bag limit for salmon (other than king salmon) to 6 per day on the Kenai River except the Russian River "fly-fishing-only" area. |

**Appendix A3.**—Emergency orders issued for Northern Kenai Peninsula Management Area waters in 2007.

| Emergency Order Number | Effective Date | Action/Justification |
|---|---|---|
| 2-NP-1-01-07 | 1/10/2007 12:01 a.m. | Adds Scout and Arc Lake to the list of lakes on the Kenai Peninsula in which five lines may be used to fish for northern pike through the ice. |
| 2-RT-1-04-07 | 5/2/2007 12:01 a.m. | Prohibits the removal of rainbow/steelhead trout from the water during the closed fishing season in flowing waters of the Kenai River to Skilak Lake. |
| 2-KS-1-03-07 | 5/1/2006 12:01 a.m. | Prohibits the filleting, heading, mutilation or disfigurement of king salmon in a manner that would prevent the determination of length. |
| 2-KS-1-07-07 | 5/17/2007 12:01 a.m. | Adds Thursdays as an additional day anglers may retain naturally-produced king salmon from the Kasilof River. |
| 2-KS-1-12-07 | 6/12/2007 12:01 a.m. | Allows the use of bait in the flowing waters of the Kenai River drainage open to fishing for king salmon. |
| 2-RS-1-15-07 | 6/18/2007 8:00 a.m. | Opens the Russian River Sanctuary Area to fishing for sockeye salmon. |
| 2-RS-1-26-07 | 7/23/2007 6:00 p.m. | Kasilof River personal use dip netting area extended up to the Sterling Highway Bridge. |
| 2-RS-1-20-07 | 7/23/2007 6:00 p.m. | Increases rod-and-reel limits for salmon (other than king salmon) on the Kasilof River to 6 per day. |
| 2-RS-1-31-07 | 7/25/2007 11:00 p.m. | Personal use fishery hours increased on the Kenai River. |
| 2-RS-1-30-07 | 7/26/2007 12:01 a.m. | Increases rod-and-reel limits for salmon (other than king salmon) on the Kenai River to 6 per day. |