

**Fishery Data Series No. 96-7**

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**Estimated Harvest of Coho Salmon of Kenai River  
Origin in Commercial Fisheries of Upper Cook Inlet  
Alaska, 1993-1994**

by

**Jamie A. Carlon**

and

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March 1996

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Alaska Department of Fish and Game

Division of Sport Fish



## Symbols and Abbreviations

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|                                       |                    |   |   |   |                         |
|---------------------------------------|--------------------|---|---|---|-------------------------|
| <b>Weights and measures (metric)</b>  |                    | <b>General</b>                                    |   | <b>Mathematics, statistics, fisheries</b>                                     |                         |
| centimeter                            | cm                 | All commonly accepted abbreviations.              | e.g., Mr., Mrs., a.m., p.m., etc.           | alternate hypothesis  | $H_A$                   |
| deciliter                             | dL                 | All commonly accepted professional titles.        | e.g., Dr., Ph.D., R.N., etc.                | base of natural logarithm   | e                       |
| gram                                  | g                  | and   | &   | catch per unit effort   | CPUE                    |
| hectare                               | ha                 | at  | @   | coefficient of variation  | CV                      |
| kilogram                              | kg                 | Compass directions:                               |   | common test statistics  | F, t, $\chi^2$ , etc.   |
| kilometer                             | km                 | east  | E   | confidence interval   | C.I.                    |
| liter                                 | L                  | north   | N   | correlation coefficient   | R (multiple)            |
| meter                                 | m                  | south   | S   | correlation coefficient   | r (simple)              |
| metric ton                            | mt                 | west  | W   | covariance  | cov                     |
| milliliter                            | ml                 | Copyright   | ©   | degree (angular or temperature)   | °                       |
| millimeter                            | mm                 | Corporate suffixes:                               |   | degrees of freedom  | df                      |
| <b>Weights and measures (English)</b> |                    | Company   | Co.   | divided by  | ÷ or / (in equations)   |
| cubic feet per second                 | ft <sup>3</sup> /s | Corporation                                       | Corp.                                       | equals  | =                       |
| foot                                  | ft                 | Incorporated                                      | Inc.  | expected value  | E                       |
| gallon                                | gal                | Limited   | Ltd.  | fork length   | FL                      |
| inch                                  | in                 | et alii (and other people)                        | et al.                                      | greater than  | >                       |
| mile                                  | mi                 | et cetera (and so forth)                          | etc.  | greater than or equal to  | ≥                       |
| ounce                                 | oz                 | exempli gratia (for example)                      | e.g.,                                       | harvest per unit effort   | HPUE                    |
| pound                                 | lb                 | id est (that is)                                  | i.e.,                                       | less than   | <                       |
| quart                                 | qt                 | latitude or longitude                             | lat. or long.                               | less than or equal to   | ≤                       |
| yard                                  | yd                 | monetary symbols (U.S.)                           | \$, ¢                                       | logarithm (natural)   | ln                      |
| Spell out acre and ton.               |                    | months (tables and figures): first three letters  | Jan,...,Dec                                 | logarithm (base 10)   | log                     |
| <b>Time and temperature</b>           |                    | number (before a number)                          | # (e.g., #10)                               | logarithm (specify base)  | log <sub>2</sub> , etc. |
| day                                   | d                  | pounds (after a number)                           | # (e.g., 10#)                               | mideye-to-fork  | MEF                     |
| degrees Celsius                       | °C                 | registered trademark                              | ®   | minute (angular)  | '                       |
| degrees Fahrenheit                    | °F                 | trademark   | ™   | multiplied by   | x                       |
| hour (spell out for 24-hour clock)    | h                  | United States (adjective)                         | U.S.  | not significant   | NS                      |
| minute                                | min                | United States of America (noun)                   | USA   | null hypothesis   | $H_0$                   |
| second                                | s                  | U.S. state and District of Columbia abbreviations | use two-letter abbreviations (e.g., AK, DC) | percent   | %                       |
| Spell out year, month, and week.      |                    |   |   | probability   | P                       |
| <b>Physics and chemistry</b>          |                    |   |   | probability of a type I error (rejection of the null hypothesis when true)    | $\alpha$                |
| all atomic symbols                    |                    |   |   | probability of a type II error (acceptance of the null hypothesis when false) | $\beta$                 |
| alternating current                   | AC                 |   |   | second (angular)  | "                       |
| ampere                                | A                  |   |   | standard deviation  | SD                      |
| calorie                               | cal                |   |   | standard error  | SE                      |
| direct current                        | DC                 |   |   | standard length   | SL                      |
| hertz                                 | Hz                 |   |   | total length  | TL                      |
| horsepower                            | hp                 |   |   | variance  | Var                     |
| hydrogen ion activity                 | pH                 |   |   |   |                         |
| parts per million                     | ppm                |   |   |   |                         |
| parts per thousand                    | ppt, ‰             |   |   |   |                         |
| volts                                 | V                  |   |   |   |                         |
| watts                                 | W                  |   |   |   |                         |

***FISHERY DATA SERIES NO. 96-7***

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1993-1994**

by

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# TABLE OF CONTENTS

|   |     |
|---|-----|
| LIST OF TABLES.....   | ii  |
| LIST OF FIGURES.....  | iii |
| LIST OF APPENDICES.....   | iv  |
| ABSTRACT.....   | 1   |
| INTRODUCTION.....   | 1   |
| Background.....   | 1   |
| Study Area.....   | 4   |
| Objectives.....   | 5   |
| METHODS.....  | 5   |
| Experimental Design and Assumptions.....  | 5   |
| Juvenile Marking.....   | 5   |
| Harvest Sampling and Mark Recovery.....   | 8   |
| Sport Fishery.....  | 8   |
| Commercial Fishery.....   | 9   |
| Data Analysis.....  | 9   |
| Estimating the Proportion of the Cohort Bearing Marks.....  | 9   |
| Harvest Estimates.....  | 11  |
| RESULTS.....  | 13  |
| Proportion of the Cohort Bearing Marks.....   | 13  |
| Commercial Harvest and Sampling Performance.....  | 16  |
| Inlet-Wide Fisheries.....   | 16  |
| Central District Drift Gillnet Fishery.....   | 16  |
| Central District Eastside Set Gillnet Fishery.....  | 22  |
| Harvest Estimates.....  | 22  |
| DISCUSSION.....   | 29  |
| Harvest Estimates.....  | 29  |
| Sampling Performance.....   | 33  |
| Fishery Trends.....   | 34  |
| Juvenile Marking and Smolt Estimates.....   | 34  |
| RECOMMENDATIONS.....  | 35  |
| ACKNOWLEDGMENTS.....  | 35  |
| LITERATURE CITED.....   | 36  |
| APPENDIX A. TAG RECOVERY DATA FROM THE KENAI RIVER SPORT HARVEST IN 1994 AND<br>THE COOK INLET COMMERCIAL HARVEST IN 1993 AND 1994..... | 39  |

## LIST OF TABLES

| <b>Table</b> |   | <b>Page</b> |
|--------------|---|-------------|
| 1.           | Releases of marked coho salmon juveniles in the Kenai River in 1992 and 1993 that returned as adults in 1994.....   | 8           |
| 2.           | Sources of marked coho salmon adults recovered from the Kenai River sport harvest, August through September, 1994.....  | 14          |
| 3.           | Commercial harvest of coho salmon in Upper Cook Inlet, 1966-1994.....   | 17          |
| 4.           | Summary of sampling effort and recovery of coded wire tags (CWT) from adipose-clipped coho salmon harvested in Upper Cook Inlet commercial fisheries in 1994..... | 19          |
| 5.           | Number of coded wire tags from coho salmon marked as juveniles in the Kenai River drainage and recovered in commercial fisheries in 1994.....                     | 20          |
| 6.           | Estimated harvest of coho salmon of Kenai River origin by the commercial drift gillnet fishery of the Central District of Upper Cook Inlet, 1993 and 1994.....    | 24          |
| 7.           | Estimated harvest of coho salmon of Kenai River origin by the eastside set gillnet fishery of Upper Cook Inlet, by statistical area, 1993 and 1994.....           | 25          |

## LIST OF FIGURES

| <b>Figure</b>  | <b>Page</b> |
|--|-------------|
| 1. Map of the Cook Inlet basin with selected tributaries.....  | 2           |
| 2. Average proportions of the statewide commercial and sport harvests of coho salmon by region, 1982-1992.....   | 3           |
| 3. Schematic map of Upper Cook Inlet showing ten commercial set gillnet and drift gillnet fishery areas and locations at which marked coho salmon were released in the Kenai River drainage in 1992 and 1993.....  | 6           |
| 4. Schematic map of Upper Cook Inlet statistical areas.....  | 7           |
| 5. Proportion of the Kenai River sport harvest bearing marks by weekly period for four marked groups returning as adults during August and September, 1994. ....   | 15          |
| 6. Coho salmon harvest in ten Upper Cook Inlet commercial fishery areas in 1994. ....  | 18          |
| 7. Coho salmon harvest and sampling performance occurring in the Upper Cook Inlet Central District drift and eastside set gillnet fisheries in 1994. Shaded regions represent the time period during which the harvest was examined. ....  | 21          |
| 8. Coho salmon harvest and sampling performance occurring in the Upper Cook Inlet Central District eastside set gillnet fishery by statistical area in 1994. Shaded region represents the time period during which the harvest was examined.....                                   | 23          |
| 9. Contribution of coho salmon of Kenai River origin to the drift gillnet and eastside set gillnet fisheries of the Central District of Upper Cook Inlet, 1993-1994.....   | 26          |
| 10. Trend in proportional contribution of coho salmon of Kenai River origin to the total harvest (top) and harvest of coho salmon of Kenai River origin (bottom) in the drift gillnet fishery of the Central District of Upper Cook Inlet, 1994.....                               | 27          |
| 11. Trend in proportional contribution of coho salmon of Kenai River origin to the total harvest (top) and harvest of coho salmon of Kenai River origin (bottom) in the drift gillnet fishery of the Central District of Upper Cook Inlet, 1993.....                               | 28          |
| 12. Trends in proportional and absolute contribution of coho salmon of Kenai River origin to the total harvest of coho salmon occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery during selected time periods in 1994. .... | 30          |
| 13. Trends in proportional and absolute contribution of coho salmon of Kenai River origin to the total harvest of coho salmon occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery during selected time periods in 1993. .... | 31          |
| 14. Absolute contribution of coho salmon of Kenai River origin relative to total harvest occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery, 1993-1994. ....  | 32          |

## LIST OF APPENDICES

| <b>Appendix</b>   | <b>Page</b> |
|---|-------------|
| A1. Sources of marked coho salmon adults recovered from the Kenai River sport harvest during August through September, 1994, as determined from coded wire tags. .... | 40          |
| A2. Kenai River sport harvest recoveries in 1994 of coho salmon adults marked as smolt early in the emigration from the Moose River in 1993. ....                     | 44          |
| A3. Kenai River sport harvest recoveries in 1994 of coho salmon adults marked as smolt late in the emigration from the Moose River in 1993. ....                      | 45          |
| A4. Coho salmon commercial harvest, tag recovery, and estimates of harvest of fish of Moose River origin for Upper Cook Inlet commercial fisheries in 1994. ....      | 46          |
| A5. Coho salmon commercial harvest, tag recovery, and estimates of harvest of fish of Moose River origin for Upper Cook Inlet commercial fisheries in 1993. ....      | 51          |

## ABSTRACT

The 1994 commercial harvest of coho salmon of Kenai River origin by Upper Cook Inlet fisheries was estimated based on the recovery of harvested adults marked with coded wire tags. In the Central District, an estimated 11,732 (SE = 746) coho salmon were harvested by the drift gillnet fishery and 14,673 (SE = 1,261) were harvested by the Upper Subdistrict (eastside) set gillnet fishery, for a total of 26,405 (SE = 1,465) coho salmon. These harvests represent 4% of the total drift gillnet harvest of 303,935 coho salmon and 21% of the total eastside set gillnet harvest of 69,281 coho salmon.

Harvest estimates for the 1993 commercial fisheries were revised for comparison with 1994 estimates. In 1993, an estimated 930 (SE = 194) coho salmon of Kenai River origin were harvested by the drift gillnet fishery and 6,806 (SE = 750) were harvested by the eastside set gillnet fishery, for a total of 7,736 (SE = 775) coho salmon harvested in the Central District. These harvests represent 1% of the total drift gillnet harvest of 121,785 and 16% of the total eastside set gillnet harvest of 43,075. Geographic and temporal trends in harvest were similar to those occurring in 1994. The harvest of coho salmon of Kenai River origin relative to the total harvest was lower than expected in both 1993 and 1994.

The commercial harvest of coho salmon of Kenai River origin was substantially lower than the estimated inriver sport harvest of 86,700 fish in 1994 and 50,500 in 1993. Prior to 1993, it was assumed that the number of coho salmon from the Kenai River harvested commercially was substantially greater than the inriver sport harvest.

The most abundant group of marked coho salmon returning to the Kenai River in 1994 was the cohort marked as smolt at the Moose River in 1993. The proportion of the entire Kenai River return marked at the Moose River was 0.1016. This proportion, which was estimated by examining the inriver recreational harvest, was used to estimate harvest by commercial fisheries. The marked proportion remained relatively constant over the duration of the recreational fishery during August and September, indicating that smolt emigrating from the Moose River were a representative sample of coho salmon from the Kenai River with respect to return timing. The Moose River is therefore a practical site for marking smolt in the future.

Based on the marked proportion, the number marked, and the number of adults examined for marks, the number of coho salmon smolt emigrating from the Kenai River in 1993 was about 978,000 (SE = 39,407) and the estimated smolt emigration in 1992 was over 879,000 (SE = 42,607). This estimate is biased somewhat high due to long-term tag loss. However, the estimated smolt-to-adult tag loss was low (2%). Multiple headmold sizes used to tag fish in 1993 allowed placement of tags to be more precise and perhaps improved tag retention rates over groups of fish tagged and released in prior years.

Key words: coho salmon, *Oncorhynchus kisutch*, sustained yield, contribution, commercial harvest, coded wire tag, Kenai River, smolt abundance, tag loss.

## INTRODUCTION

### BACKGROUND

Coho salmon *Oncorhynchus kisutch* spawn and rear in freshwater drainages of Upper Cook Inlet (UCI) (Figure 1). Adults returning to spawn are harvested annually in mixed-stock commercial and sport marine fisheries. Sport and personal use harvests also occur in freshwater. The largest sport harvests and the second largest commercial harvests of coho salmon in the state of Alaska occur in Upper Cook Inlet (Figure 2).

An assessment program was initiated by the Alaska Department of Fish and Game in 1991 to assess the status of UCI coho salmon stocks. Despite the importance of UCI coho salmon fisheries, no such program existed before 1991. A primary study component of the program involves the wild stock of coho salmon from the Kenai River. The Kenai River stock was selected for assessment because of concerns regarding a history of large, annual inriver harvests, an increasing trend in angler effort, and an unknown level of exploitation. These fish support the

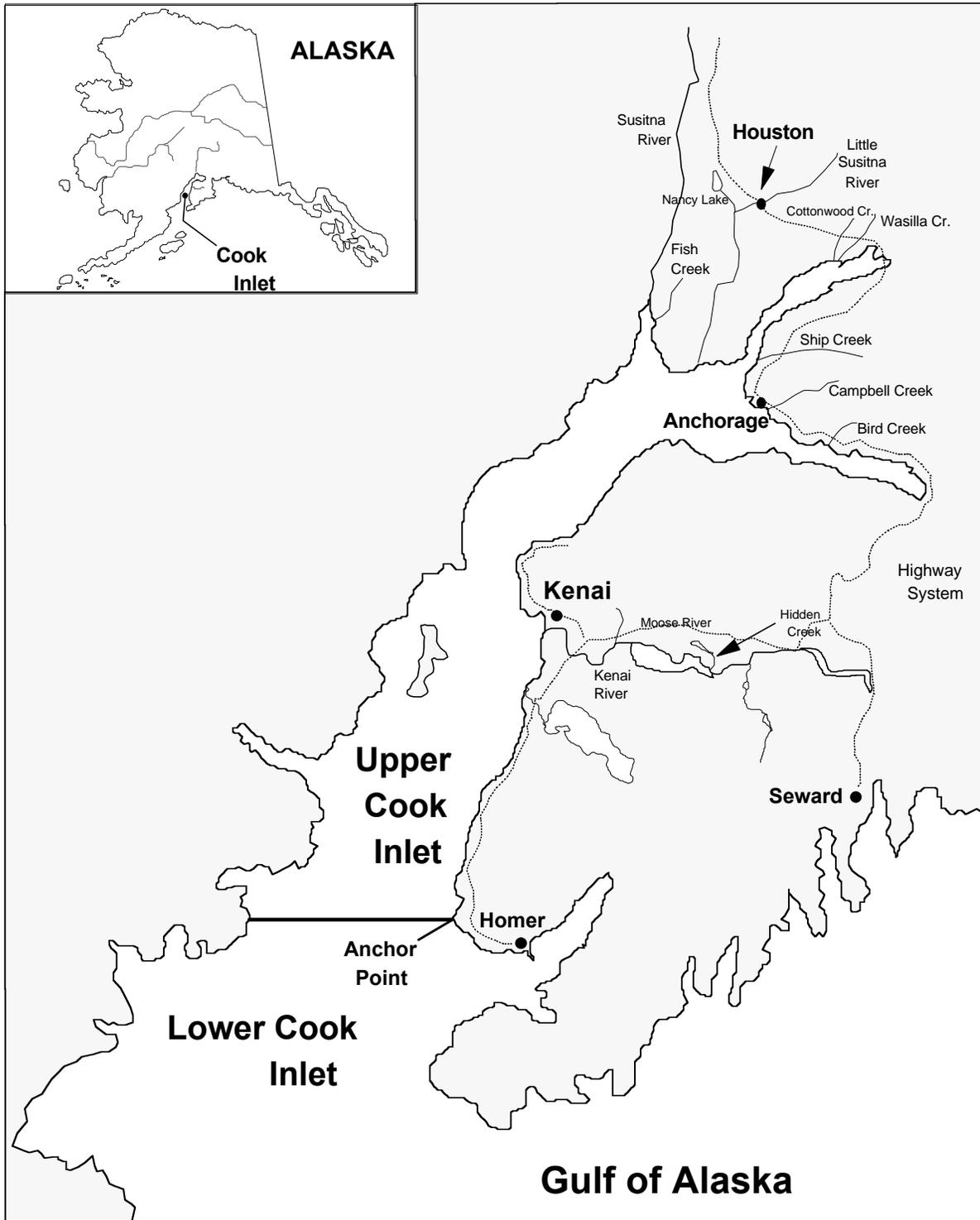
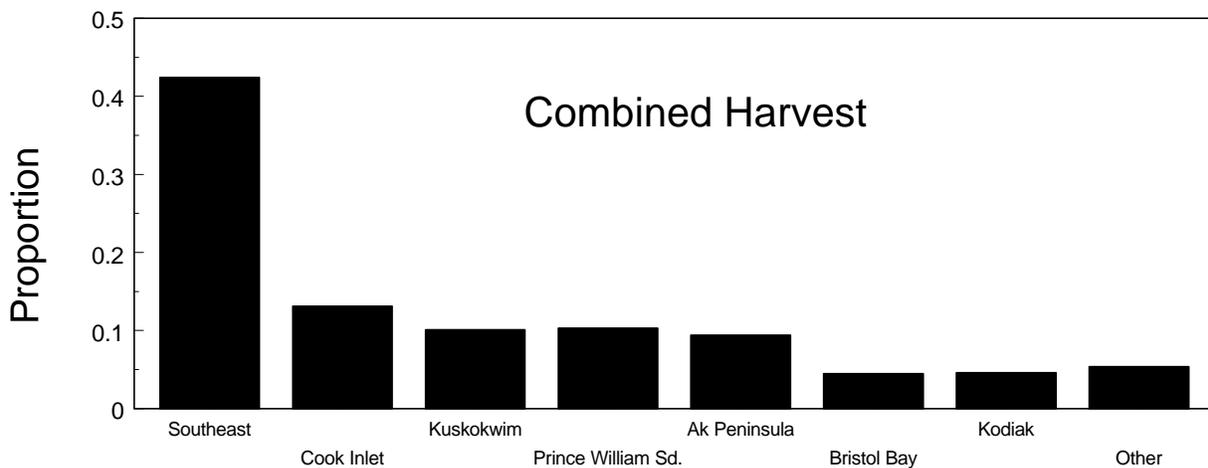
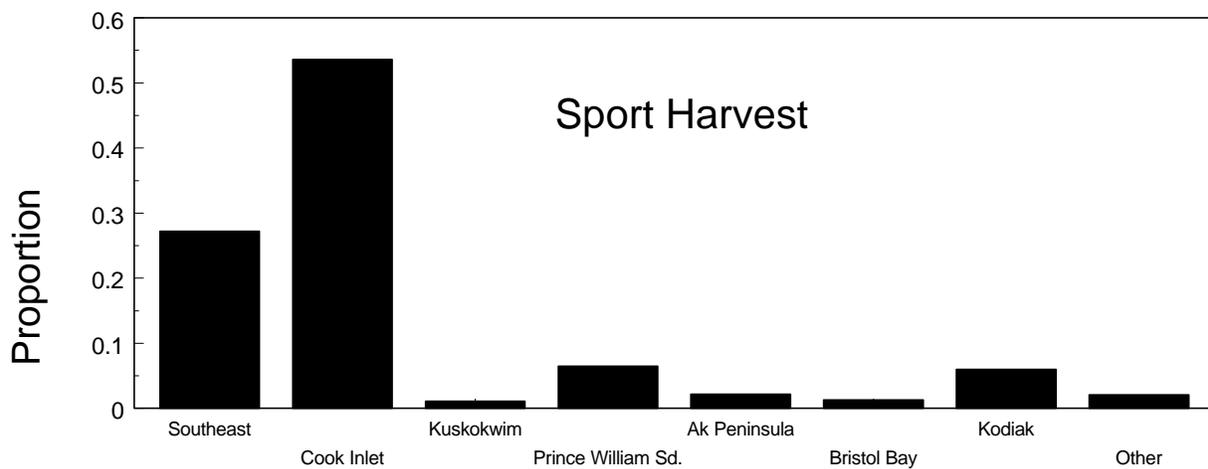
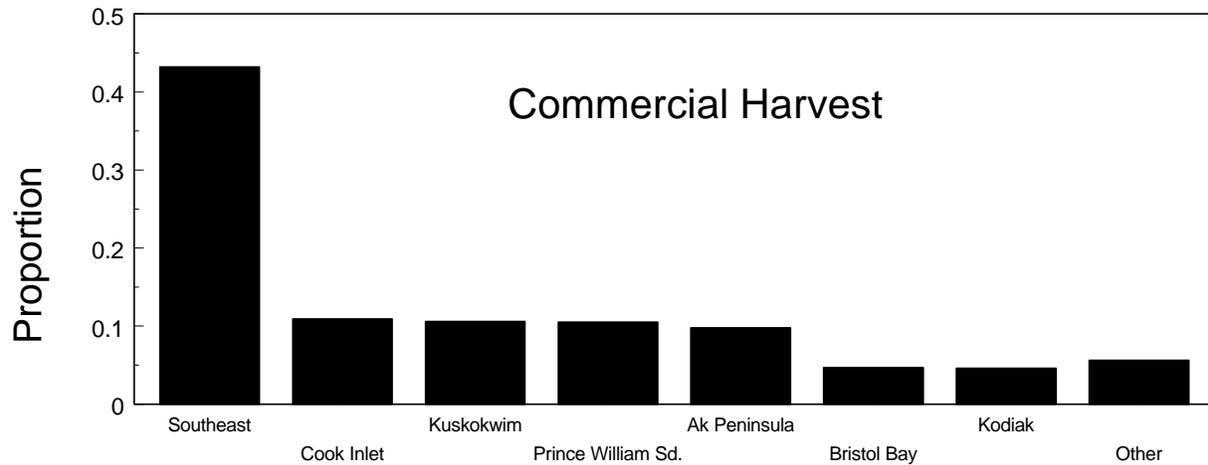


Figure 1.-Map of the Cook Inlet basin with selected tributaries.



Data from: Rigby et. al. (1991); Mills (1992) Region

**Figure 2.-Average proportions of the statewide commercial and sport harvests of coho salmon by region, 1982-1992.**

largest freshwater sport harvest in the state (Mills 1979-1994) and contribute to large, commercial marine harvests of UCI. Marine sport and inriver personal use fisheries also harvest relatively small numbers of the stock.

The initial goal of the Kenai River stock assessment program was to estimate a series of annual exploitation and production rates to determine if exploitation is threatening sustained production. The approach was to estimate annual run sizes from concurrent estimates of: (1) the inriver sport and personal use harvests, (2) the spawning escapement, and (3) the stock-specific harvest in marine commercial fisheries. Harvest by the marine sport and inriver personal use fisheries are currently small relative to the inriver sport harvest and are considered insignificant in the early stages of the assessment program. Although the inriver sport and personal use harvests are estimated annually by angler surveys (Hammarstrom 1977, 1978 and 1988-1992; Schwager-King 1993; Mills 1979-1994), spawning escapements and commercial harvests have not been estimated.

The feasibility of using sonar to estimate escapement has been tested in a companion project (Bendock and Vaught 1994). That study concluded that sonar was impractical for discriminating among migrating coho, sockeye *O. nerka*, and pink *O. gorbuscha* salmon. In the absence of escapement estimates, smolt abundance estimates are being investigated for their utility as indices of production of Kenai River stocks.

Although estimates of escapement are not available, estimates of the commercial harvest are. The first estimates were made during the 1993 return (Carlson and Hasbrouck 1994) and have been revised since publication. The original 1993 estimates were correct as documented, but the revisions will allow direct comparisons among years. The revised estimates are presented herein with the newly available estimates for 1994.

Vincent-Lang and McBride (1989) concluded that quantifying stock contributions using traits such as length-at-age, migratory timing, and scale patterns are not precise enough to define management objectives. Therefore, in developing the assessment program, microwire tagging of juvenile coho salmon within the Kenai River drainage was recommended to allow positive identification of returning marked adults in the mixed-stock harvest (Meyer et al. *Unpublished*). Statistical procedures exist for estimating the harvest of contributing stocks based on recoveries of fish marked with coded, microwire tags (Clark and Bernard 1987, Bernard and Clark *In prep*). These procedures have been applied in commercial (Elliot et al. 1989, Elliot and Sterritt 1990) and sport (Sonnichsen et al. 1987; Vincent-Lang et al. 1988; Carlson and Vincent-Lang 1989 and 1990) marine coho salmon fisheries in Alaska.

A byproduct of estimating commercial harvest with this procedure is an annual estimate of smolt production. A series of smolt production estimates may obviate escapement estimates for the purpose of assessing stock status. A new study goal is to monitor annual smolt abundance in relation to past harvest levels to determine if large harvests negatively affect smolt production.

## **STUDY AREA**

The study area encompassed fingerling and smolt rearing areas within the Kenai River drainage (the outlets of Skilak Lake and Kenai Lake, and tributaries to Moose River and Hidden Creek) (Figure 3), the lower 34 km of the Kenai River where most of the sport fishery occurs, and the marine waters of Upper Cook Inlet (Figure 4).

Ten general fishery areas comprise the Upper Cook Inlet Management Area and all fishery areas are comprised of smaller statistical areas for the purpose of reporting harvest (Figure 4). The commercial harvest was examined at processing plants and buying stations located along the Cook Inlet coast line from Homer to Anchorage.

## **OBJECTIVES**

The primary objective of this study was to estimate the harvest of coho salmon of Kenai River origin in the eastside set gillnet and drift gillnet fisheries of the Central District of Upper Cook Inlet in 1994.

Prerequisite objectives were to:

1. estimate the marked proportion of the adult population returning to the Kenai River during 2-week periods from August 1 through September 30, 1994; and
2. test the null hypothesis that the marked proportion remained constant over the duration of the return in August and September.

## **METHODS**

### **EXPERIMENTAL DESIGN AND ASSUMPTIONS**

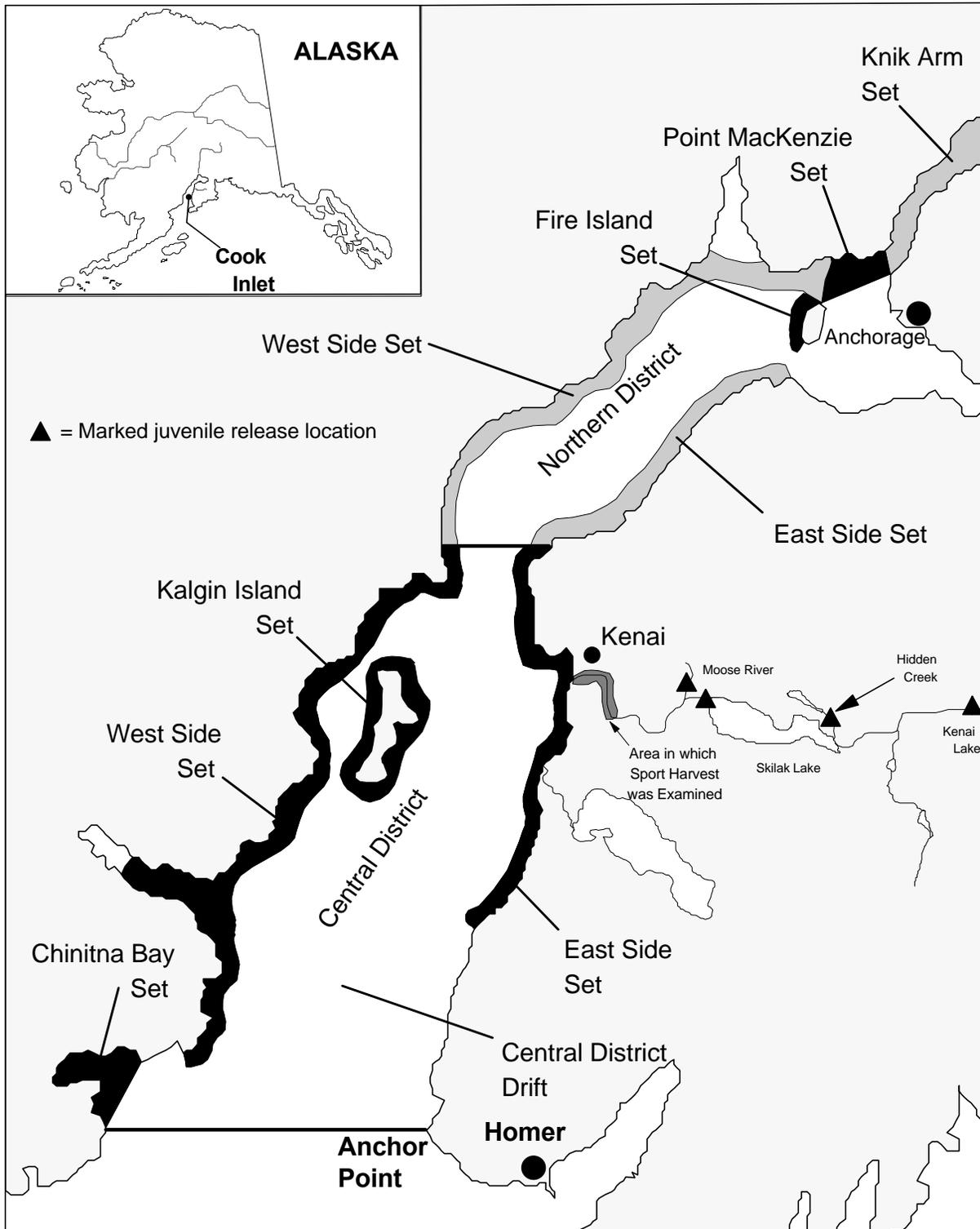
Harvest of a stock of fish can be estimated by marking a cohort of juveniles and recovering marked adults in the fishery. Total harvest in the fishery and the proportion of the cohort bearing marks must be known or estimated. The number of marks recovered from the fishery can then be expanded into a stock-specific harvest estimate to account for unmarked fish in the cohort and for the portion of the total harvest not examined.

To estimate commercial harvest of coho salmon from the Kenai River, juvenile coho salmon were captured within the Kenai River drainage and marked with coded wire tags. Total harvest of coho salmon in commercial fisheries was available from the Alaska Department of Fish and Game Commercial Fish Ticket System. The proportion of the cohort marked was estimated by sampling the inriver sport harvest for marked individuals.

An assumption of this methodology is that marked individuals are a representative sample of the cohort (Clark and Bernard 1987). Thus, marked individuals must mix with unmarked individuals such that the proportion of marked individuals remains constant throughout the return of the cohort. This assumption was evaluated by examining coho salmon harvested in the Kenai River sport fishery for marks and testing the hypothesis that the marked proportion did not change over time. Failure to reject this hypothesis indicates that marked individuals are a representative sample of the cohort. Rejecting the hypothesis indicates that marked individuals are a biased sample of the population and estimating the commercial harvest of the cohort is not possible.

### **JUVENILE MARKING**

Juvenile coho salmon were captured and marked within the Kenai River drainage (Carlson and Hasbrouck 1993). Fingerling were marked at the outlets of Skilak Lake and Kenai Lake during the fall of 1992; smolt emigrating from the Kenai River were marked at the Moose River and Hidden Creek during the spring of 1993 (Table 1).



**Figure 3.-Schematic map of Upper Cook Inlet showing ten commercial set gillnet and drift gillnet fishery areas and locations at which marked coho salmon were released in the Kenai River drainage in 1992 and 1993.**

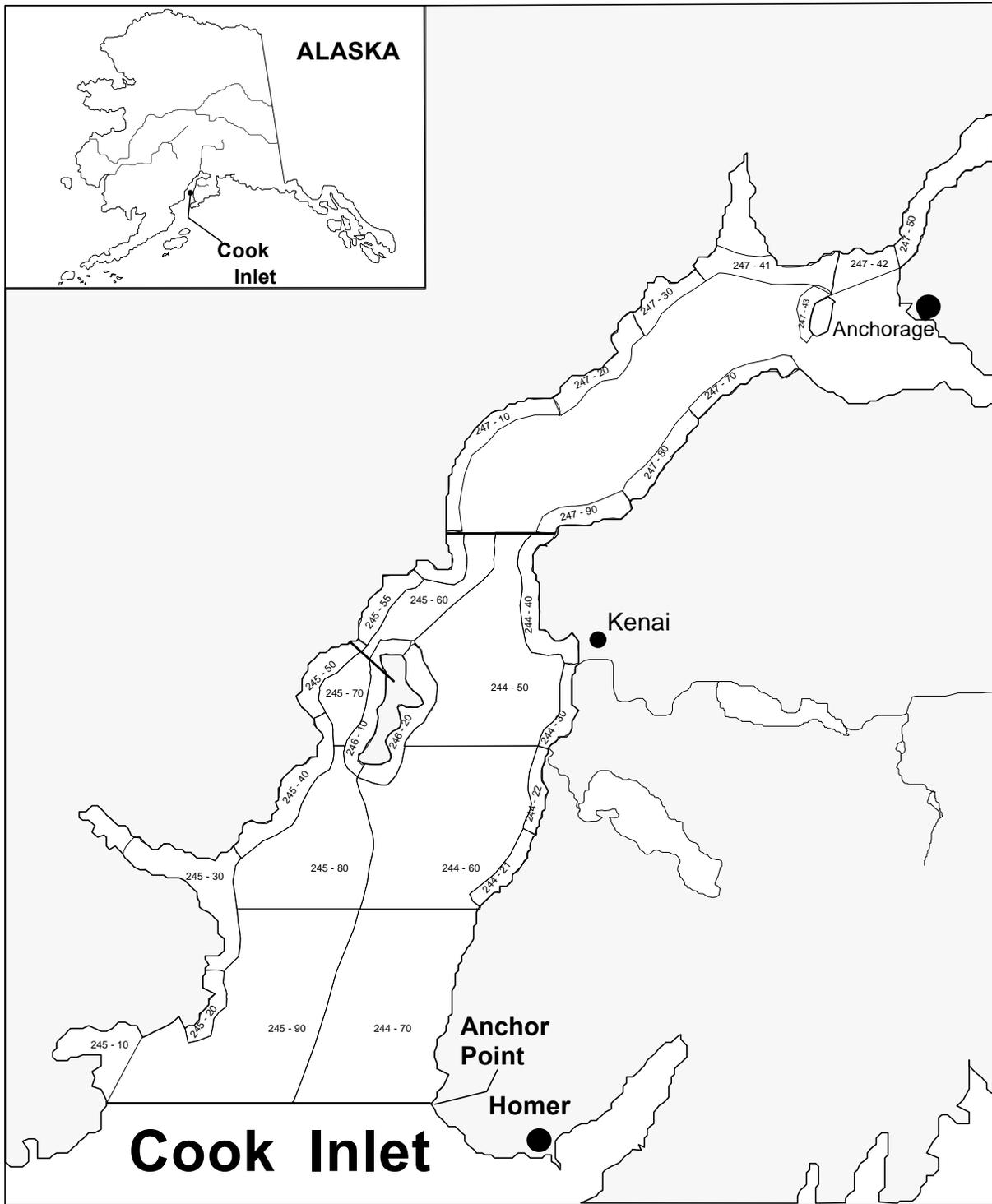


Figure 4.-Schematic map of Upper Cook Inlet statistical areas.

**Table 1.-Releases of marked coho salmon juveniles in the Kenai River in 1992 and 1993 that returned as adults in 1994.**

| Kenai River<br>Release Location | Marked Fish<br>Released <sup>a</sup> | Tagged Fish<br>Released <sup>b</sup> | Lifestage<br>at Release | Release<br>Dates   |
|---------------------------------|--------------------------------------|--------------------------------------|-------------------------|--------------------|
| Moose River                     | 100,206                              | 99,525                               | Smolt                   | 5/23 - 6/18, 1993  |
| Hidden Creek                    | 22,131                               | 22,128                               | Smolt                   | 6/05 - 6/29, 1993  |
| Skilak Lake Outlet              | 18,424                               | 18,413                               | Fingerling              | 8/13 - 10/15, 1992 |
| Kenai Lake Outlet               | 1,802                                | 1,802                                | Fingerling              | 8/27 - 10/09, 1992 |

Modified from: Carlon and Hasbrouck (1993).

<sup>a</sup> Marked fish refers to all fish released with an adipose finclip.

<sup>b</sup> Tagged fish refers to all marked fish that did not shed the embedded CWT during overnight tag retention test period.

Juveniles were handled and marked following standard coded wire tagging procedures (Moberly et al. 1977). All fish were tagged with a Northwest Marine Technologies® Mark IV tag injector. Prior to tagging, smolt were sorted by size classes to more adequately fit an optimum-size injector headmold (Larry Peltz, Alaska Department of Fish and Game, Division of Sport Fish, Palmer, personal communication). This resulted in more precise tag placement within each size class of smolt. Fingerling were adequately tagged with one headmold. The adipose fin was removed from tagged fish as a secondary mark. Fish were released at the point of capture.

### **HARVEST SAMPLING AND MARK RECOVERY**

Sport and commercial harvests were examined to recover marked coho salmon. The sport harvest was examined to estimate the proportion bearing marks; the commercial harvest was examined to recover marked fish of known origin.

#### **Sport Fishery**

Sport fishing for coho salmon occurs throughout the Kenai River mainstem from its mouth upstream to the outlet of Kenai Lake. The majority of the harvest is taken from the lower 34 km of the river downstream of the Sterling Highway bridge in the town of Soldotna. The fishery occurs primarily during August and September, after which harvest and effort decline to low levels due to inclement weather and apparently decreasing numbers of coho salmon. Only limited spawning occurs in tributaries that enter the mainstem downstream of the bridge in Soldotna.

During August and September 1994, coho salmon harvested in the inriver sport fishery of the Kenai River were examined for a missing adipose fin. Daily counts of total fish examined and of those missing an adipose fin were recorded. Heads were collected from most adipose-clipped fish and shipped to the ADF&G Tag Lab. Some anglers desired trophy mounts or entered fish in salmon derby contests; heads were not recovered in these cases. Sampled fish received a caudal fin punch to avoid examining fish twice.

Only fish harvested from the lower 34 km of the mainstem Kenai River were examined. This river section provided the best opportunity to examine a random sample of the adult return before fish could escape the sport fishery by entering spawning tributaries. Because estimates of catch and harvest are nearly identical (Hammarstrom 1992; Schwager-King 1993), the sport fishery is nonselective and examining the sport harvest for marked fish likely provides a random sample of the inriver return.

### **Commercial Fishery**

Central District fisheries harvest coho salmon between late June and early September. After mid-August, the eastside set gillnet fishery is closed by regulation and the drift gillnet fishery is restricted to the western side of Cook Inlet. Drift gillnetting occurs on the western side of the inlet until numbers of fish decline to low levels, typically in early September. In 1994, the drift gillnet season opened by regulation on June 27 and the eastside set gillnet season opened on July 1. The fisheries are managed primarily for sockeye salmon through various combinations of time and area restrictions. Fishery management guidelines are described in the Upper Cook Inlet Salmon Management Plan; 1994 management actions are described by Ruesch and Fox (1995).

Commercially harvested coho salmon were examined at processing plants, buying stations, and aboard tenders throughout UCI. Harvests sampled intensely during 1994 included the drift gillnet and the eastside set gillnet fisheries of the Central District and the set gillnet fisheries of the Northern District. These three areas historically account for most of the UCI harvest (Ruesch and Fox 1994). Northern District fisheries were sampled to estimate the contribution of hatchery-stocked coho salmon that were released in selected Northern District streams (Stratton et al. *In prep*). The Central District eastside set gillnet harvest was examined until the fishery closed on August 15. The drift gillnet and the Northern District harvests were examined until harvests declined to low levels in early September. Harvest in other fisheries was sampled incidentally throughout the season or not at all.

Sampling personnel recorded daily totals of the number of coho salmon examined and the number that were missing an adipose fin. Heads were collected from most adipose-clipped fish, frozen, and later shipped to the Tag Lab for retrieval of the embedded coded wire tag. The following information was also recorded: date sold (date harvested), statistical area of harvest when available, and processor. In general, the statistical area was known for set gillnet harvests. Drift gillnet harvests were typically a mix of fish from multiple statistical areas.

### **DATA ANALYSIS**

Data analysis included estimating the proportion of coho salmon from the Kenai River marked with a coded wire tag, estimating the commercial harvest of this cohort of fish in two fisheries in UCI, and estimating the number of smolt that emigrated from the Kenai River in 1993. Commercial harvest and sampling performance were also summarized.

#### **Estimating the Proportion of the Cohort Bearing Marks**

Estimating the commercial harvest of coho salmon from the Kenai River required estimating the proportion of the cohort marked with coded wire tags. This proportion was unknown when juvenile coho salmon were marked, but was estimated when the cohort returned as adults during 1994. The inriver sport harvest was examined for marks and the proportion marked with a missing adipose fin during each 2-week interval  $i$ , was estimated as a binomial proportion by (Cochran 1977):

$$\hat{p}_i = \frac{x_i}{n_i}, \quad (1)$$

where:

$x_i$  = the number of coho salmon observed missing the adipose fin during interval  $i$ , and

$n_i$  = the total number of coho salmon examined during interval  $i$ .

The proportion of coded wire tags of each release location recovered from heads that were actually collected during each interval was also estimated by (Cochran 1977):

$$\hat{c}_i = \frac{t_i}{h_i}, \quad (2)$$

where:

$t_i$  = the number of tags of a release site recovered during interval  $i$ , and

$h_i$  = the number of heads collected from coho salmon missing the adipose fin.

A chi-square statistic was used to test the hypothesis that the proportion missing the adipose fin ( $\hat{p}_i$ ) did not change over time, and further to test the hypothesis that the proportion of tags recovered from each release location ( $\hat{c}_i$ ) did not change over time. Based on inriver recoveries of marked coho salmon in 1993 (Carlton and Hasbrouck 1994), the *a priori* value of the proportion missing the adipose fin ( $\hat{p}_i$ ) under the null hypothesis equaled 0.07. Sampling was designed to detect a difference of 0.02 from the hypothesized value among the time intervals at  $\alpha = 0.05$  and power =  $1 - \beta \geq 0.70$ . Failure to reject these hypotheses would indicate that marked adults were a representative sample of the cohort and would allow combining all of the inriver recovery data to estimate the overall marked proportion of the cohort. However, if only coho salmon marked at particular release locations (e.g., Moose River) were a representative sample, then inriver recovery data would be combined and the marked proportion ( $\hat{\theta}$ ) estimated as the product of  $\hat{p}$  and of  $\hat{c}$  for the release location(s).

Estimation and hypothesis testing was therefore a two-step process. The first step involved sampling the inriver sport harvest to observe coho salmon missing the adipose fin. The second step occurred at the Tag Lab by decoding tags of heads actually collected from the sport harvest to determine the release location. This approach differs from that used last year (Carlton and Hasbrouck 1994) in that it accounts for the head not being collected from all coho salmon missing the adipose fin. Data collected from the sport harvest in 1993 was reanalyzed using this new approach.

If the proportion marked does not differ among time intervals, then the number of smolt that emigrated from the Kenai River in 1993 could be estimated. The smolt emigration was estimated using the Chapman modified Lincoln-Petersen model (Seber 1982):

$$\hat{N} = \frac{(M+1)(C+1)}{(R+1)} - 1, \quad (3)$$

where:

- M = the number of marked smolt emigrating with a coded wire tag in 1993,
- C = the number of adult coho salmon examined in the sport harvest for a missing adipose fin, and
- R = the number of adult coho salmon recovered from the sport harvest that were marked in the Kenai River.

The variance was estimated by:

$$V(\hat{N}) = \frac{(M+1)(C+1)(M-R)(C-R)}{(R+1)^2(R+2)}. \quad (4)$$

This model assumes that adult coho salmon examined for marks were a random sample of the inriver return, survival and catchability were the same for marked and unmarked individuals, tag code and release location was correctly determined for all fish observed with a missing adipose fin in the sport harvest, and that no tags were lost between the mark and recovery events.

The relationship between the return timing of marked adults and the time of smolt marking was investigated for fish marked at the Moose River in 1993. If smolt emigration from the Moose River and adult return timing to the Kenai River are independent, then in future years marking a representative sample of the desired number of smolt may occur over a shorter time period. A chi-square statistic was used to test the hypothesis that the return timing of adults marked as smolt at the Moose River was independent of the time of tagging. The hypothesis was tested at  $\alpha = 0.05$  with the smolt sample divided into tag codes representing the first 50% of the smolt marked (May 23-June 1) and those of the second 50% of the smolt marked (June 2-June 17). The distributions of tag recoveries of these two groups were compared over 2-week intervals during August and September of 1994.

### Harvest Estimates

Estimates of commercial harvest of coho salmon of Kenai River origin were stratified by date. The eastside set gillnet harvest was additionally stratified by statistical area. The drift gillnet harvest was not stratified by area because the harvest delivered to processors was often a mixture of fish harvested from more than one statistical area. Therefore, estimates of the harvest of Kenai River coho salmon were made by date and area for the eastside set gillnet fishery and by date only for the drift gillnet fishery. The total harvest of Kenai River coho salmon by each fishery was estimated by summing estimates of each stratum. Because strata were considered independent, the variance of total harvest was calculated by summing strata variances. The Commercial Fish Ticketing System managed by the Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division provided the commercial harvest by fishery, date, and statistical area.

The commercial harvest of coho salmon from the Kenai River was estimated for each stratum by (Clark and Bernard 1987; Bernard and Clark *In prep*):

$$\hat{n}_1 = H\hat{\theta}^{-1} \begin{pmatrix} a_1 m_1 m_c \\ a_2 m_2 n_2 \end{pmatrix} = H\hat{\theta}^{-1} \hat{p}, \quad (5)$$

where:

- H = total number of fish in the harvest,
- $\hat{\theta}$  = proportion of the cohort bearing tags,
- a<sub>1</sub> = number of heads collected from fish with a missing adipose fin,
- a<sub>2</sub> = number of heads that arrived at the Tag Lab,
- m<sub>1</sub> = number of heads with tags detected,
- m<sub>2</sub> = number of tags found and decoded,
- m<sub>c</sub> = number of tags decoded for the cohort, and
- n<sub>2</sub> = number of fish in the harvest examined for a missing adipose fin.

This estimator is statistically unbiased when sampling is from a simple random or pseudo-random process (Clark and Bernard 1987). An unbiased estimate of the variance is (Bernard and Clark *In prep*):

$$V[\hat{n}_1] = \hat{n}_1^2 \left[ G(\hat{p}) + G(\hat{\theta}^{-1}) - G(\hat{p})G(\hat{\theta}^{-1}) \right], \quad (6)$$

where:

$$G(\hat{p}) = \frac{1 - \lambda\phi\theta}{\lambda n_2 \hat{p}},$$

$$\lambda = \frac{m_2 a_2}{m_1 a_1},$$

$$\phi = \frac{n_2}{N}, \text{ and}$$

$$G(\hat{\theta}^{-1}) = \frac{V(\hat{\theta}^{-1})}{\hat{\theta}^{-2}}.$$

Although the number of fish harvested is based on fish weight, the overall variance of the number harvested is small because the entire harvest is weighed; therefore, the number of coho salmon harvested by fishery was considered a known, not an estimate. The total estimate of harvest when the data were pooled among processors did not differ significantly ( $z = 0.67$ ,  $P = 0.50$ ) from that when the data were stratified by processor, and the estimate with the data pooled was more precise. Therefore, harvest estimates were based on data pooled among processors.

Harvest that occurred on dates not sampled was combined with the harvest on the nearest date that was sampled. Combining the harvest of dates not sampled with that of dates sampled would cause little bias in the estimates because only 3% of the drift gillnet harvest and 13% of the eastside set gillnet harvest occurred on dates not sampled. Because harvest estimates in 1993 were only for dates sampled and were potentially based on a biased estimate of the proportion marked (Carlson and Hasbrouck 1994), these estimates were recalculated combining harvest of

dates not sampled with dates the harvest was sampled. Harvest estimates are therefore comparable among years regardless of unsampled dates.

Estimates were combined into time intervals that approximated statistical weeks to document seasonal trends. It was not possible to match time intervals in 1994 with those in 1993 because of overlap among unsampled days.

## RESULTS

### PROPORTION OF THE COHORT BEARING MARKS

Of the 5,395 coho salmon examined for a missing adipose fin in the inriver sport harvest, heads were recovered from 477 of the 644 adipose-clipped adults observed (Table 2, Appendix A1). Of the 477 heads processed at the Tag Lab, 85% were marked as smolt at the Moose River in 1993. Tags were missing from 12 (2%) of the recovered heads. An additional 146 coho salmon heads were voluntarily delivered by anglers to department personnel. Of these, the majority (87%) were marked at the Moose River in 1993.

The proportion of adipose-clipped fish in the sport harvest differed significantly ( $\chi^2 = 11.11$ ,  $df = 2$ ,  $P = 0.01$ ) among 2-week intervals. Because observed proportions did not differ dramatically, even among 1-week intervals (Figure 5), these results arise from the large sample size which allows detection of a statistical difference in the proportion marked that is probably not ecologically significant. We concluded that biases in the estimates of commercial harvest and smolt abundance due to combining sport harvest samples would likely be small. Too few tags were recovered from fish marked at Hidden Creek in 1993 to test for differences over time. The proportion of tags recovered over 2-week periods for the Skilak Lake group were significantly different ( $\chi^2 = 8.34$ ,  $df = 3$ ,  $P = 0.04$ ). The proportion of tags recovered from fish marked at the Moose River did not differ significantly among 2-week intervals ( $\chi^2 = 3.68$ ,  $df = 3$ ,  $P = 0.30$ ). In addition, the return timing of adults was independent of time of marking as smolt at the Moose River in 1993 ( $\chi^2 = 7.23$ ,  $df = 3$ ,  $P = 0.06$ ) (Appendices A2 and A3) and all tag codes released at the Moose River were observed in the adult return. These results indicate that only the cohort marked at the Moose River was representative of the Kenai River cohort returning as adults in 1994; thus only those fish were used for estimation. The marked proportion ( $\hat{\theta}$ ) of the Kenai River cohort returning in 1994 was 0.1016 [ $V(\hat{\theta}^{-1}) = 0.2160$ ].

Similar results were obtained when we reexamined the 1993 inriver sport harvest data. There was no difference ( $\chi^2 = 6.12$ ,  $df = 3$ ,  $P = 0.11$ ) in the proportion of fish observed missing the adipose fin among 2-week intervals. Only fish marked as smolt at the Moose River in 1992 had no obvious trend ( $\chi^2 = 2.62$ ,  $df = 3$ ,  $P = 0.45$ ) in tags recovered among 2-week intervals. Thus, only fish marked at the Moose River were a representative sample of the Kenai River cohort returning in 1993, and only these fish were used for estimation. The marked proportion ( $\hat{\theta}$ ) of the cohort returning in 1993 was 0.0836 [ $V(\hat{\theta}^{-1}) = 0.4042$ ].

Using the number of smolt marked at the Moose River in 1993 (99,525), the number of adult coho salmon examined for marks in the Kenai River sport harvest in 1994 (5,395), and the

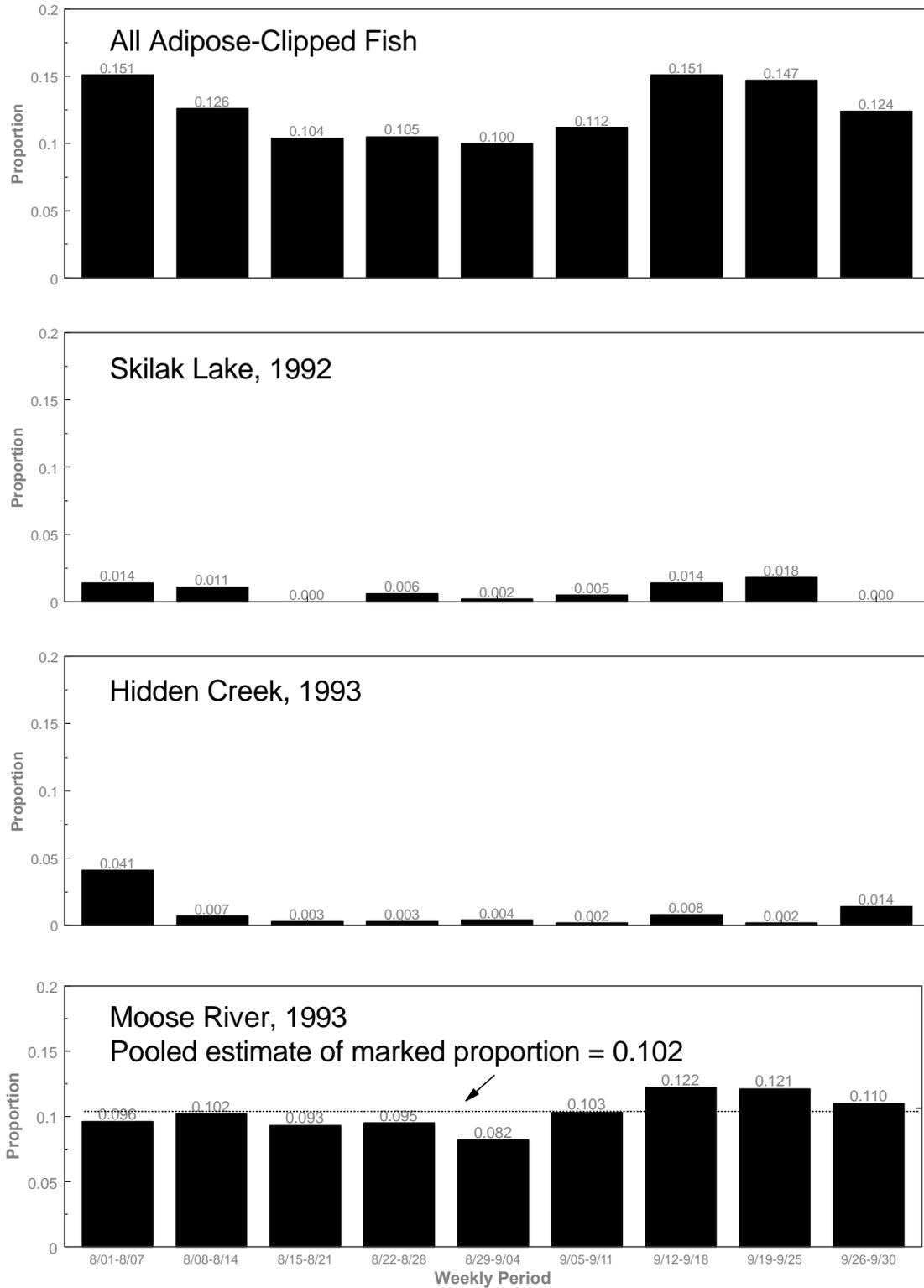
**Table 2.-Sources of marked coho salmon adults recovered from the Kenai River sport harvest, August through September, 1994.**

| Period       | Number Examined | Marked Fish Observed | Marked Fish Recovered | CWT Missing | Release Location and Year for Decodable CWT's |               |                |                            |              |                           |                              |                           |                           |          |
|--------------|-----------------|----------------------|-----------------------|-------------|---|---------------|----------------|----------------------------|--------------|---------------------------|------------------------------|---------------------------|---------------------------|----------|
|              |                 |                      |                       |             | Moose R 1993                                  | Skilak L 1992 | Hidden Cr 1993 | Skilak L 1991 <sup>a</sup> | Kenai L 1992 | Bird Cr 1993 <sup>b</sup> | Crooked Cr 1993 <sup>b</sup> | Ship Cr 1993 <sup>b</sup> | Moose R 1994 <sup>c</sup> |          |
| 8/01 - 8/07  | 73              | 11                   | 11                    |             | 7   | 1             | 3              |                            |              |                           |                              |                           |                           |          |
| 8/08 - 8/14  | 587             | 74                   | 57                    | 1           | 46  | 5             | 3              |                            |              |                           |                              | 1                         | 1                         |          |
| 8/15 - 8/21  | 810             | 84                   | 60                    | 1           | 54  |               | 2              | 1                          | 1            | 1                         |                              |                           |                           |          |
| 8/22 - 8/28  | 940             | 99                   | 70                    |             | 63  | 4             | 2              | 1                          |              |                           |                              |                           |                           |          |
| 8/29 - 9/04  | 692             | 69                   | 52                    | 3           | 43  | 1             | 2              | 2                          |              |                           |                              |                           |                           | 1        |
| 9/05 - 9/11  | 874             | 98                   | 71                    | 1           | 65  | 3             | 1              | 1                          |              |                           |                              |                           |                           |          |
| 9/12 - 9/18  | 749             | 113                  | 73                    | 3           | 59  | 7             | 4              |                            |              |                           |                              |                           |                           |          |
| 9/19 - 9/25  | 573             | 84                   | 74                    | 3           | 61  | 9             | 1              |                            |              |                           |                              |                           |                           |          |
| 9/26 - 9/30  | 97              | 12                   | 9                     |             | 8   |               | 1              |                            |              |                           |                              |                           |                           |          |
| <b>Total</b> | <b>5,395</b>    | <b>644</b>           | <b>477</b>            | <b>12</b>   | <b>406</b>                                    | <b>30</b>     | <b>19</b>      | <b>5</b>                   | <b>1</b>     | <b>1</b>                  | <b>1</b>                     | <b>1</b>                  | <b>1</b>                  | <b>1</b> |

<sup>a</sup> Five fingerling marked in the Kenai River in 1991 did not smolt until 1993 and were recovered in 1994.

<sup>b</sup> Three hatchery-produced coho salmon released in Northern Cook Inlet were captured in the Kenai River as strays.

<sup>c</sup> One coho salmon smolt marked in 1994 at the Moose River was recaptured during the same year.



**Figure 5.-Proportion of the Kenai River sport harvest bearing marks by weekly period for four marked groups returning as adults during August and September, 1994.**

estimated number of tagged adults recovered that were marked at the Moose River (548); the estimated number of smolt emigrating from the Kenai River in 1993 was 977,964 (SE = 39,407).

Similarly, using the number of smolt marked at the Moose River in 1992 (73,580), the number of adult coho salmon examined for marks in the Kenai River sport harvest in 1993 (4,626), and the estimated number of tagged adults recovered that were marked at the Moose River (386); the estimated number of smolt that emigrated from the Kenai River in 1992 was 879,290 (SE = 42,607).

## **COMMERCIAL HARVEST AND SAMPLING PERFORMANCE**

Sampling effort was directed at commercial fisheries that historically account for most of the coho salmon harvest in Upper Cook Inlet. Harvests in other fisheries were examined incidentally or not at all. Harvest and sampling performance among fisheries was summarized to provide information with which to refine future sampling efforts and to provide perspective for commercial harvest estimates.

### **Inlet-Wide Fisheries**

In 1994, 580,567 coho salmon were harvested in commercial fisheries of UCI. This harvest was 14% greater than the average of the last 10 years and 64% greater than the average since 1966 (Table 3).

About 75% of the 1994 UCI commercial harvest was taken in Central District fisheries (Figure 6). The greatest harvest occurred in the drift gillnet fishery of the Central District, followed by the set gillnet fishery on the west side of the Northern District and the Central District eastside set gillnet fishery. The other seven fisheries accounted for 19% of the total harvest.

Of the inlet-wide harvest, 139,139 fish (24% of the total harvest) were examined for adipose clips (Table 4, Appendix A4). The most intensely sampled fisheries were the Northern District set gillnet fisheries as a group, the Central District drift gillnet fishery, and the Central District eastside set gillnet fishery. Of all fish examined, 4,624 (3%) adipose-clipped fish were found; heads were recovered from all but 54 fish. Adipose-clipped fish were found in all sampled fisheries. All recovered tags were from adults released within the Kenai River drainage or as hatchery-produced smolt or fingerling. Of the 4,570 heads recovered, 507 (11%) had no tag.

A total of 649 tags from six groups of coho salmon released in the Kenai River drainage were recovered from UCI commercial harvests in 1994 (Table 5). The cohort marked as smolt at the Moose River in 1993 comprised the majority (81%) of the marks recovered, followed by the cohort marked at Hidden Creek as smolt in 1993 (11%) and the cohort marked as fingerling at the outlet of Skilak Lake in 1992 (6%). A small number (2%) were recovered from other releases including six fish from a prior release at the outlet of Skilak Lake in 1991 and two from the Moose River in 1992. Most (98%) of the tag recoveries were from Central District fisheries, with the remaining 2% recovered from Northern District fisheries. Harvest estimates were therefore made only for the Central District drift gillnet and eastside set gillnet fisheries.

### **Central District Drift Gillnet Fishery**

Harvest of the Central District drift gillnet fishery was sampled during most openings between July 8 and August 26 (Figure 7). No coho salmon were commercially harvested after September 9. Only 3% of the total harvest occurred on days not sampled. Harvest that occurred on days

**Table 3.-Commercial harvest of coho salmon in Upper Cook Inlet, 1966-1994.**

| Year                         | Central District |                      |  |                               | Total   |
|------------------------------|------------------|----------------------|--|-------------------------------|---------|
|                              | Drift Gillnet    | Eastside Set Gillnet | Kalgin Island/<br>Westside Set Gillnet | Northern District Set Gillnet |         |
| 1966                         | 80,901           | 68,877               | 59,509                                 | 80,550                        | 289,837 |
| 1967                         | 53,071           | 40,738               | 40,066                                 | 43,854                        | 177,729 |
| 1968                         | 167,383          | 80,828               | 63,301                                 | 156,648                       | 468,160 |
| 1969                         | 33,053           | 18,988               | 28,231                                 | 20,425                        | 100,697 |
| 1970                         | 114,070          | 30,114               | 52,299                                 | 82,722                        | 279,205 |
| 1971                         | 35,491           | 16,589               | 26,188                                 | 22,094                        | 100,362 |
| 1972                         | 21,577           | 24,673               | 15,300                                 | 19,346                        | 80,896  |
| 1973                         | 31,784           | 23,901               | 24,784                                 | 23,951                        | 104,420 |
| 1974                         | 75,640           | 36,837               | 40,610                                 | 47,038                        | 200,125 |
| 1975                         | 88,579           | 46,209               | 53,537                                 | 33,051                        | 221,376 |
| 1976                         | 80,712           | 47,873               | 42,243                                 | 37,835                        | 208,663 |
| 1977                         | 110,184          | 23,693               | 38,093                                 | 20,623                        | 192,593 |
| 1978                         | 76,259           | 34,134               | 61,711                                 | 47,089                        | 219,193 |
| 1979                         | 114,496          | 29,284               | 68,306                                 | 53,078                        | 265,164 |
| 1980                         | 89,510           | 40,281               | 51,527                                 | 90,098                        | 271,416 |
| 1981                         | 226,366          | 36,024               | 88,390                                 | 134,625                       | 485,405 |
| 1982                         | 416,274          | 108,393              | 182,205                                | 85,352                        | 792,224 |
| 1983                         | 326,965          | 37,694               | 97,796                                 | 53,867                        | 516,322 |
| 1984                         | 213,423          | 37,166               | 84,618                                 | 114,786                       | 449,993 |
| 1985                         | 357,388          | 70,657               | 147,331                                | 91,837                        | 667,213 |
| 1986                         | 506,405          | 76,385               | 85,932                                 | 88,108                        | 756,830 |
| 1987                         | 202,306          | 74,977               | 74,930                                 | 98,920                        | 451,133 |
| 1988                         | 277,703          | 55,419               | 77,058                                 | 149,742                       | 559,922 |
| 1989                         | 743              | 81,744               | 81,004                                 | 175,710                       | 339,201 |
| 1990                         | 247,453          | 40,351               | 73,429                                 | 139,401                       | 500,634 |
| 1991                         | 175,504          | 30,435               | 87,515                                 | 132,270                       | 425,724 |
| 1992                         | 267,300          | 57,078               | 53,400                                 | 91,133                        | 468,911 |
| 1993                         | 121,785          | 43,075               | 35,704                                 | 106,258                       | 306,822 |
| 1983 -1993 Mean <sup>a</sup> | 269,623          | 52,324               | 81,771                                 | 106,632                       | 510,350 |
| 1966 -1993 Mean <sup>a</sup> | 167,096          | 45,580               | 64,963                                 | 76,470                        | 354,110 |
| 1994                         | 303,935          | 69,281               | 63,287                                 | 144,064                       | 580,567 |

<sup>a</sup> Due to anomolous management of fisheries during the *Exxon Valdez* oil spill, 1989 is excluded from calculations of mean.

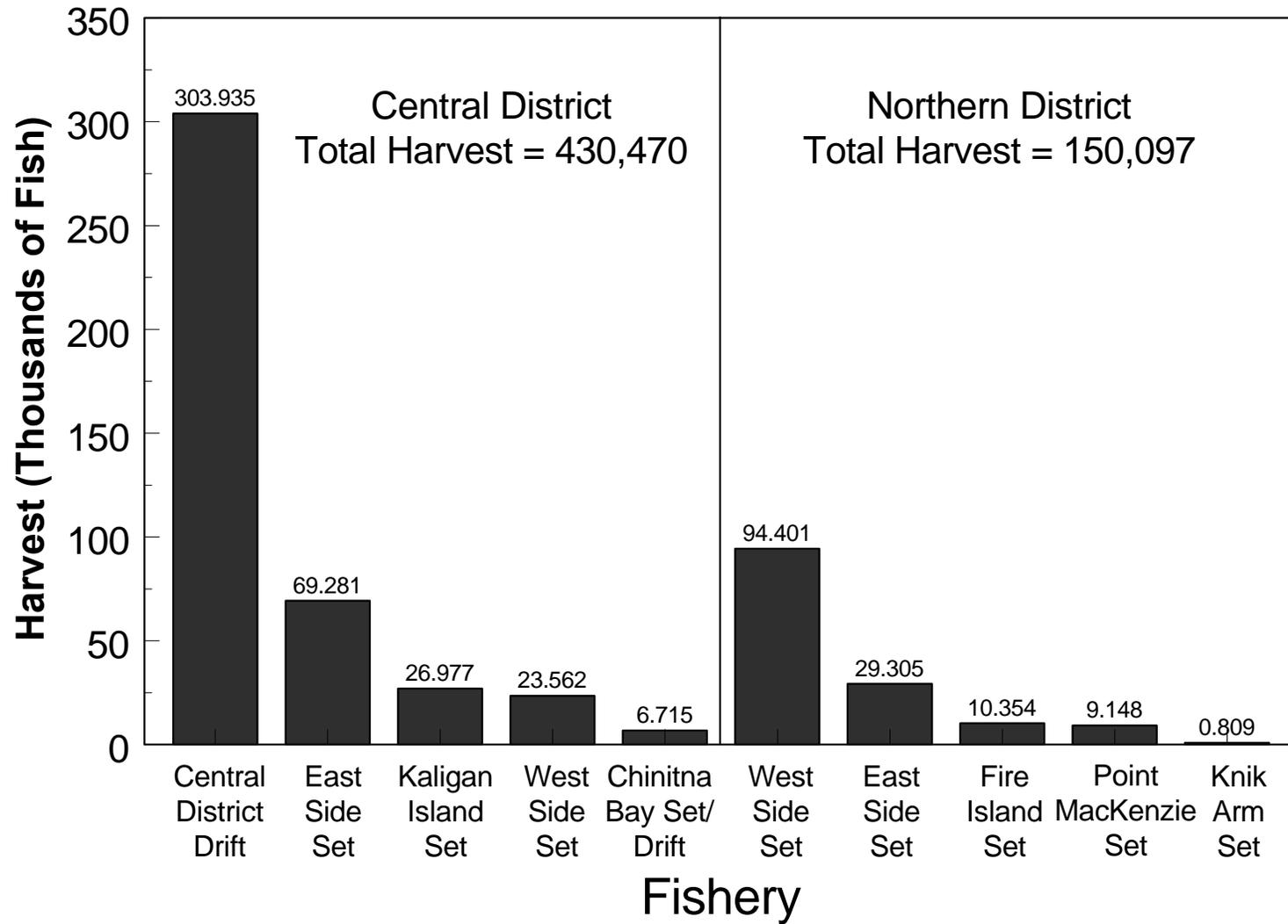


Figure 6.-Coho salmon harvest in ten Upper Cook Inlet commercial fishery areas in 1994.

**Table 4.-Summary of sampling effort and recovery of coded wire tags (CWT) from adipose-clipped coho salmon harvested in Upper Cook Inlet commercial fisheries in 1994.**

| Gillnet Fishery          | Harvest | Number Examined     | Percent of Harvest | Ad-clips Found | Heads Recovered | Heads Missing CWT | Heads with Decodable CWT <sup>a</sup> |
|--------------------------|---------|---------------------|--------------------|----------------|-----------------|-------------------|---------------------------------------|
| <b>Central District</b>  |         |                     |                    |                |                 |                   |                                       |
| Drift                    | 303,935 | 66,423              | 22                 | 2,051          | 2,009           | 207               | 1,800                                 |
| East Side Set Net        |         |                     |                    |                |                 |                   |                                       |
| 244-21                   | 14,572  | 2,264               | 16                 | 119            | 118             | 17                | 100                                   |
| 244-22                   | 12,604  | 3,231               | 26                 | 201            | 200             | 29                | 171                                   |
| 244-30                   | 14,977  | 2,149               | 14                 | 78             | 75              | 9                 | 66                                    |
| 244-40                   | 27,128  | 3,530               | 13                 | 124            | 124             | 11                | 113                                   |
| Total                    | 69,281  | 11,174              | 16                 | 522            | 517             | 66                | 450                                   |
| Kalgin Is. Set Net       | 26,977  | 2,138               | 8                  | 96             | 96              | 11                | 85                                    |
| West Side Set Net        | 23,562  | 0 <sup>b</sup>      | 0                  |                |                 |                   |                                       |
| Chinitna Bay Set/Drift   | 6,715   | 0                   | 0                  |                |                 |                   |                                       |
| Central District Total   | 430,470 | 79,735              | 19                 | 2,669          | 2,622           | 284               | 2,335                                 |
| <b>Northern District</b> |         |                     |                    |                |                 |                   |                                       |
| West Side Set            | 94,401  | 33,296 <sup>b</sup> | 35                 | 848            | 848             | 134               | 714                                   |
| East Side Set            | 29,305  | 17,301              | 59                 | 384            | 383             | 36                | 347                                   |
| Fire Is. Set             | 10,354  | 3,413               | 33                 | 355            | 349             | 21                | 328                                   |
| Pt. MacKenzie Set        | 9,148   | 2,255               | 25                 | 153            | 153             | 10                | 143                                   |
| Susitna Flats            | 6,080   | 3,139               | 52                 | 215            | 215             | 19                | 196                                   |
| Knik Arm Set             | 809     | 0                   | 0                  |                |                 |                   |                                       |
| Northern District Total  | 150,097 | 59,404              | 40                 | 1,955          | 1,948           | 220               | 1,728                                 |
| Grand Total              | 580,567 | 139,139             | 24                 | 4,624          | 4,570           | 507               | 4,063                                 |

<sup>a</sup> Includes marked fish released in the Kenai River and at other Cook Inlet release locations.

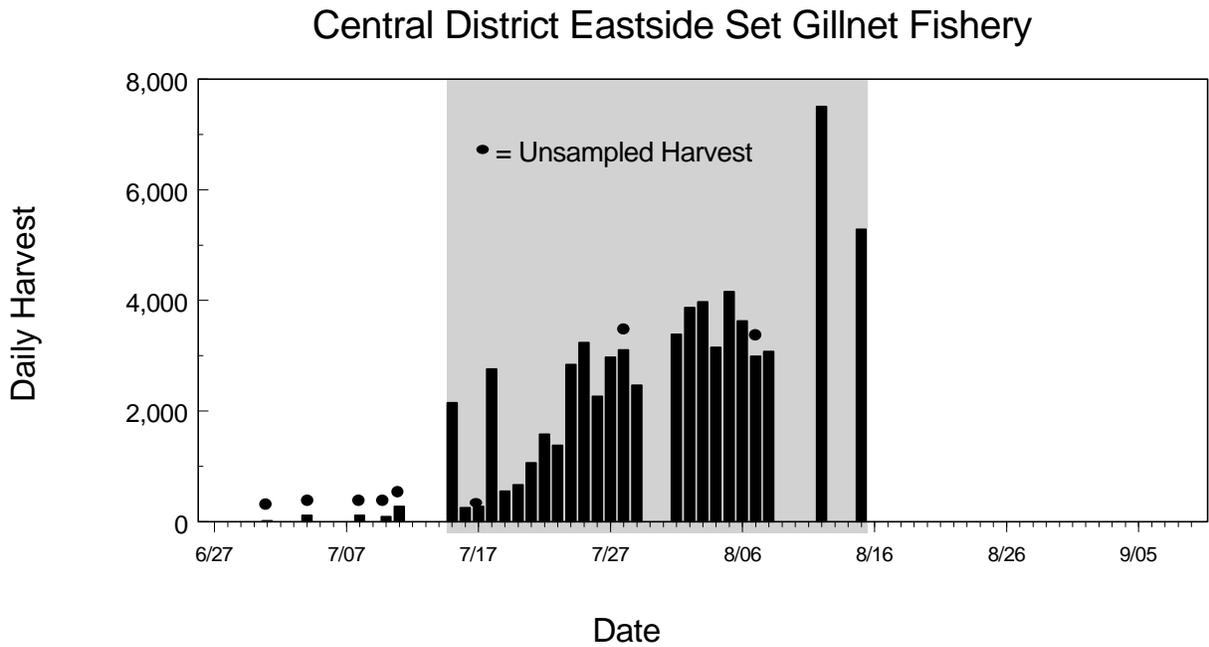
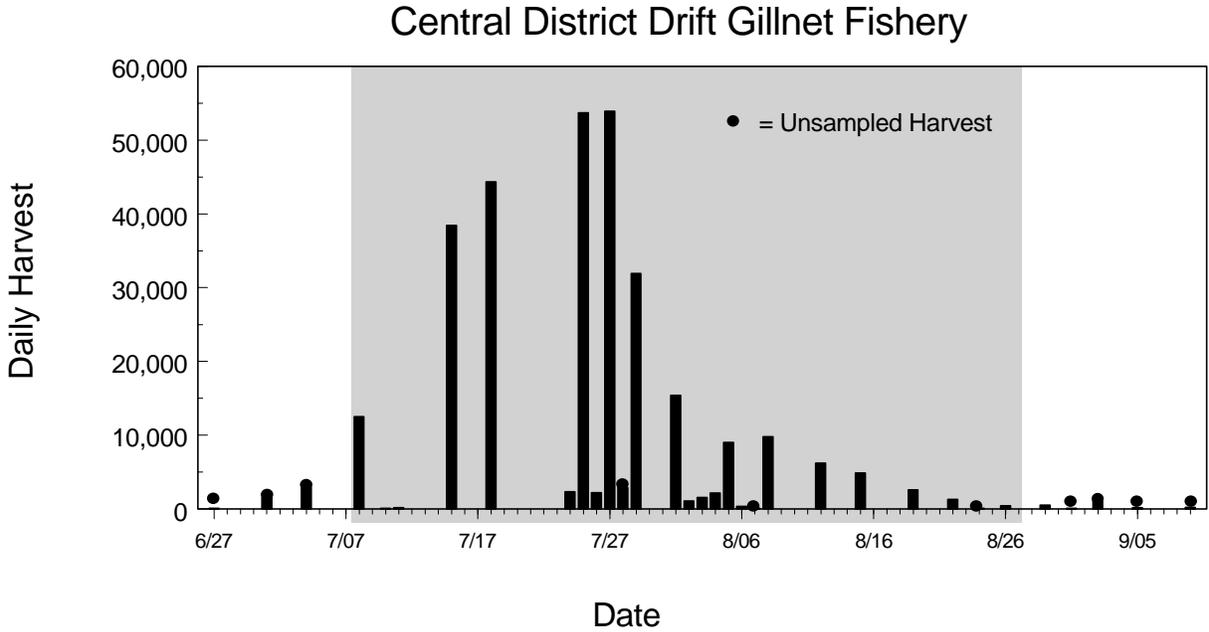
<sup>b</sup> Fish captured in Central District statistical area 245-60 were occasionally mixed in tender holds with fish harvested from the Northern District westside set gillnet fishery prior to examination. The harvest and examined fish are included with those from the Northern District westside set gillnet fishery.

**Table 5.-Number of coded wire tags from coho salmon marked as juveniles in the Kenai River drainage and recovered in commercial fisheries in 1994.**

| Gillnet Fishery               | Location and Year Marked |                      |                     |                     |                    |                     | Total |
|-------------------------------|--------------------------|----------------------|---------------------|---------------------|--------------------|---------------------|-------|
|                               | Moose River<br>1993      | Hidden Creek<br>1993 | Skilak Lake<br>1992 | Skilak Lake<br>1991 | Kenai Lake<br>1992 | Moose River<br>1992 |       |
|                               | <b>Central District</b>  |                      |                     |                     |                    |                     |       |
| Drift                         | 272                      | 39                   | 22                  | 3                   | 5                  | 2                   | 343   |
| East Side                     | 238                      | 32                   | 14                  | 3                   | 1                  |                     | 288   |
| Kalgin Is. Set <sup>a</sup>   | 2                        |                      |                     |                     |                    |                     | 2     |
| West Side Set <sup>a</sup>    |                          |                      |                     |                     |                    |                     | 0     |
| Chinitna Bay Set <sup>a</sup> |                          |                      |                     |                     |                    |                     | 0     |
| Central District Total        | 512                      | 71                   | 36                  | 6                   | 6                  | 2                   | 633   |
|                               | <b>Northern District</b> |                      |                     |                     |                    |                     |       |
| West Side Set <sup>b</sup>    | 2                        |                      |                     |                     |                    |                     | 2     |
| East Side Set                 | 10                       | 2                    | 1                   |                     |                    |                     | 13    |
| Fire Is. Set                  | 1                        |                      |                     |                     |                    |                     | 1     |
| Point MacKenzie Set           |                          |                      |                     |                     |                    |                     | 0     |
| Knik Arm Set <sup>a</sup>     |                          |                      |                     |                     |                    |                     | 0     |
| Northern District Total       | 13                       | 2                    | 1                   | 0                   | 0                  | 0                   | 16    |
| Grand Total                   | 525                      | 73                   | 37                  | 6                   | 6                  | 2                   | 649   |

<sup>a</sup> Incidental or no sampling of fishery occurred.

<sup>b</sup> Includes fish harvested from Central District statistical area 245-60. Occasionally, coho salmon harvested in 245-60 were mixed in tender holds with fish harvested in the Northern District westside set gillnet fishery prior to examination.



**Figure 7.-Coho salmon harvest and sampling performance occurring in the Upper Cook Inlet Central District drift and eastside set gillnet fisheries in 1994. Shaded regions represent the time period during which the harvest was examined.**

that were not sampled was combined with the nearest day on which the harvest was sampled; harvest estimates therefore apply to the entire 1994 commercial fishing season.

The first recoveries of fish tagged at Moose River were made on July 18, 10 days after sampling began (Appendix A4). Coho salmon marked at the Moose River were recovered from harvests on all but 2 sampled days between July 18 and August 15. Only one marked fish was recovered after August 15 when fishing effort was restricted to the western side of the Central District. Of all fish examined, the proportion that were marked as smolt at the Moose River in 1993 was 0.004.

### **Central District Eastside Set Gillnet Fishery**

Harvest of the Central District eastside set gillnet fishery was sampled during most fishing periods from July 15 through August 15 (Figure 7). Only 13% of the total eastside set gillnet harvest occurred on days not sampled. Among statistical areas, the portion of the harvest occurring on unsampled days ranged from 10% to 15% (Figure 8). Harvest on unsampled days was combined with the harvest occurring on the nearest sampled day to estimate the total harvest of coho salmon of Kenai River origin.

The greatest portion of the harvest (39%) occurred in area 244-40 followed by areas 244-30 (22%), 244-21 (21%), and 244-22 (18%). Over 25% of the harvest from area 244-22 was examined, while a lesser portion of the harvest occurring in the other areas was examined (Table 4).

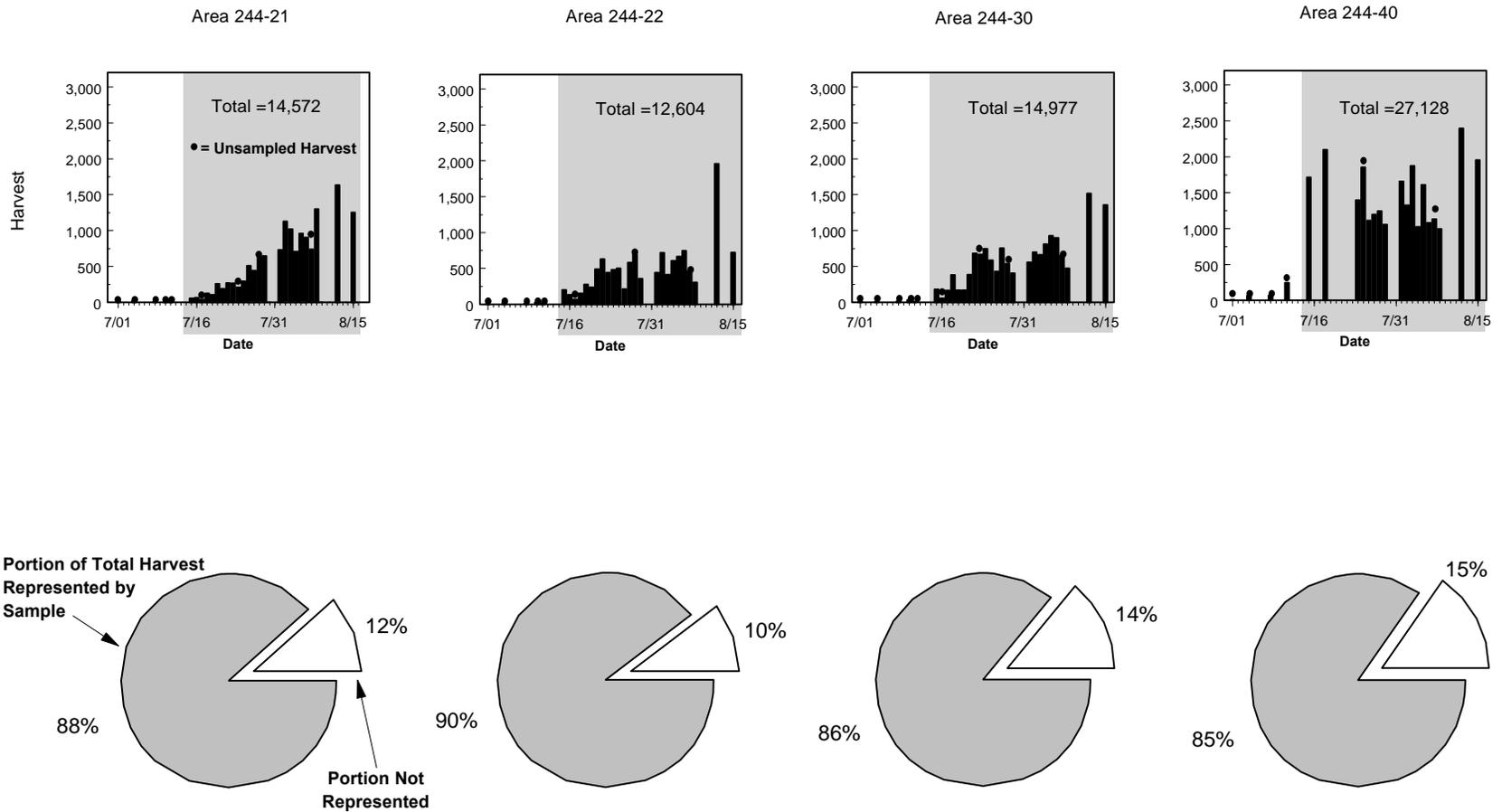
Coho salmon marked at the Moose River in 1993 were recovered from all four statistical areas in 1994. The first recovery of Moose River marks was on July 19 in the two southern statistical areas (244-21 and 244-22) and on July 18 in the two northern statistical areas (244-30 and 244-40), several days after sampling began on July 15 (Appendix A4). Based on the total number of fish examined in each statistical area, the proportions of fish marked at the Moose River were 0.028, 0.031, 0.010, and 0.015 in statistical areas 244-21, 244-22, 244-30, and 244-40, respectively.

### **HARVEST ESTIMATES**

An estimated 11,732 (SE = 746) coho salmon of Kenai River origin were harvested by the drift gillnet fishery and 14,673 (SE = 1,261) by the eastside set gillnet fishery, for a total of 26,405 (SE = 1,465) coho salmon harvested by Central District fisheries during 1994 (Tables 6 and 7). Coho salmon of Kenai River origin comprised 4% of the total drift gillnet harvest and 21% of the total eastside set gillnet harvest in 1994. This stock accounted for lower portions of the harvest in 1993 (Figure 9).

Kenai River coho salmon were not detected in the drift gillnet harvest until July 18 in 1994 (Appendix A4). The harvest before that date accounted for 18% (55,697 coho salmon) of the total harvest. The highest proportion of harvest of Kenai River coho salmon occurred during the first 3 weeks of August, while the highest absolute harvest occurred during late July and the first week of August (Figure 10). The greatest absolute harvest also occurred earlier than the greatest proportional harvest in 1993 (Figure 11, Appendix A5).

Kenai River coho salmon were not detected in the eastside set gillnet harvest until July 18 in 1994 (Appendix A4). The combined harvest of the four statistical areas before this date



**Figure 8.-Coho salmon harvest and sampling performance occurring in the Upper Cook Inlet Central District eastside set gillnet fishery by statistical area in 1994. Shaded region represents the time period during which the harvest was examined.**

**Table 6.-Estimated harvest of coho salmon of Kenai River origin by the commercial drift gillnet fishery of the Central District of Upper Cook Inlet, 1993 and 1994.**

| Period      | Total Harvest | Harvest of Kenai River Origin | Variance | Relative Precision |
|-------------|---------------|-------------------------------|----------|--------------------|
| <b>1994</b> |               |                               |          |                    |
| 6/27-7/08   | 17,040        | 0                             | 0        |                    |
| 7/09-7/15   | 38,657        | 0                             | 0        |                    |
| 7/16-7/23   | 44,368        | 263                           | 13,694   | 0.87               |
| 7/24-7/31   | 147,031       | 4,299                         | 239,583  | 0.22               |
| 8/01-8/08   | 39,443        | 5,696                         | 249,755  | 0.17               |
| 8/09-8/15   | 11,091        | 1,459                         | 53,245   | 0.31               |
| 8/16-8/24   | 3,938         | 15                            | 210      | 1.89               |
| 8/25-9/09   | 2,367         | 0                             | 0        |                    |
| 1994 Total  | 303,935       | 11,732                        | 556,487  | 0.12               |
| <b>1993</b> |               |                               |          |                    |
| 6/25-7/17   | 8,867         | 0                             | 0        |                    |
| 7/18-7/24   | 44,247        | 106                           | 5,528    | 1.37               |
| 7/25-7/31   | 49,691        | 574                           | 21,911   | 0.51               |
| 8/01-8/07   | 13,224        | 250                           | 10,314   | 0.80               |
| 8/08-9/03   | 5,756         | 0                             | 0        |                    |
| 1993 Total  | 121,785       | 930                           | 37,753   | 0.41               |

**Table 7.-Estimated harvest of coho salmon of Kenai River origin by the eastside set gillnet fishery of Upper Cook Inlet, by statistical area, 1993 and 1994.**

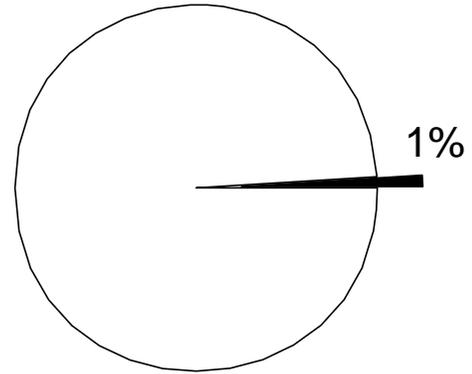
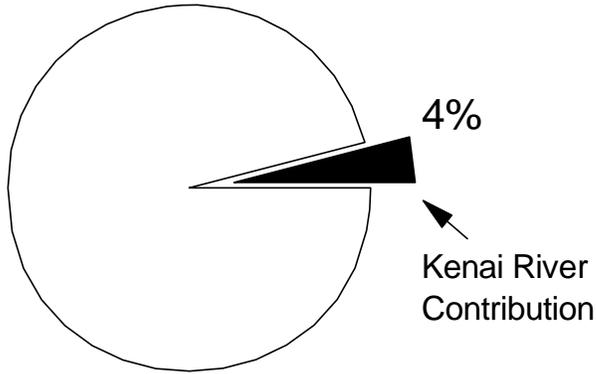
|      |           | Statistical Area |                      |          |           |         |                      |          |           |         |                      |          |           |         |                      |          |           | Total    |                      |           |           |  |
|------|-----------|------------------|----------------------|----------|-----------|---------|----------------------|----------|-----------|---------|----------------------|----------|-----------|---------|----------------------|----------|-----------|----------|----------------------|-----------|-----------|--|
|      |           | 244-21           |                      |          |           | 244-22  |                      |          |           | 244-30  |                      |          |           | 244-40  |                      |          |           |          |                      |           |           |  |
|      |           | Total            | Kenai                | Relative |           |         |                      |          | Total     | Kenai   | Relative             |          |           |         |                      | Total    | Kenai     | Relative |                      |           |           |  |
| Year | Period    | Harvest          | Harvest <sup>a</sup> | Variance | Precision | Harvest | Harvest <sup>a</sup> | Variance | Precision | Harvest | Harvest <sup>a</sup> | Variance | Precision | Harvest | Harvest <sup>a</sup> | Variance | Precision | Harvest  | Harvest <sup>a</sup> | Variance  | Precision |  |
| 1994 | 7/01-7/15 | 137              | 0                    | 0        |           | 286     | 0                    | 0        |           | 256     | 0                    | 0        |           | 2,104   | 0                    | 0        |           | 2,783    | 0                    | 0         |           |  |
|      | 7/16-7/23 | 1,324            | 252                  | 16,120   | 0.99      | 2,438   | 97                   | 3,054    | 1.12      | 2,685   | 75                   | 2,058    | 1.19      | 2,099   | 54                   | 1,407    | 1.36      | 8,546    | 478                  | 22,639    | 0.62      |  |
|      | 7/24-7/31 | 2,738            | 946                  | 67,568   | 0.54      | 2,833   | 416                  | 14,144   | 0.56      | 3,465   | 210                  | 9,203    | 0.90      | 7,865   | 171                  | 7,189    | 0.97      | 16,901   | 1,743                | 98,104    | 0.35      |  |
|      | 8/01-8/08 | 7,489            | 1,657                | 200,493  | 0.53      | 4,367   | 2,059                | 75,995   | 0.26      | 5,696   | 1,668                | 432,242  | 0.77      | 10,706  | 2,626                | 209,767  | 0.34      | 28,258   | 8,010                | 918,497   | 0.23      |  |
|      | 8/09-8/15 | 2,884            | 937                  | 52,092   | 0.48      | 2,680   | 1,236                | 115,279  | 0.54      | 2,875   | 928                  | 172,841  | 0.88      | 4,354   | 1,341                | 210,021  | 0.67      | 12,793   | 4,442                | 550,233   | 0.33      |  |
|      | Total     | 14,572           | 3,792                | 336,273  | 0.30      | 12,604  | 3,808                | 208,472  | 0.24      | 14,977  | 2,881                | 616,344  | 0.53      | 27,128  | 4,192                | 428,384  | 0.31      | 69,281   | 14,673               | 1,589,473 | 0.17      |  |
| 1993 | 6/28-7/24 | 321              | 0                    | 0        |           | 587     | 153                  | 23,256   | 1.95      | 2,054   | 0                    | 0        |           | 3,013   | 0                    | 0        |           | 5,975    | 153                  | 23,256    | 1.95      |  |
|      | 7/25-7/31 | 977              | 314                  | 98,283   | 1.96      | 1,547   | 218                  | 23,611   | 1.38      | 5,316   | 649                  | 111,895  | 1.01      | 10,916  | 318                  | 20,504   | 0.88      | 18,756   | 1,499                | 254,293   | 0.66      |  |
|      | 8/01-8/07 | 1,098            | 410                  | 15,225   | 0.59      | 1,677   | 667                  | 40,344   | 0.59      | 4,631   | 1,286                | 86,853   | 0.45      | 5,407   | 634                  | 16,071   | 0.39      | 12,813   | 2,997                | 158,493   | 0.26      |  |
|      | 8/08-8/13 | 1,357            | 469                  | 13,859   | 0.49      | 1,321   | 661                  | 38,642   | 0.58      | 1,319   | 564                  | 53,198   | 0.80      | 1,534   | 463                  | 21,457   | 0.62      | 5,531    | 2,157                | 127,156   | 0.32      |  |
|      | Total     | 3,753            | 1,193                | 127,367  | 0.59      | 5,132   | 1,699                | 125,853  | 0.41      | 13,320  | 2,499                | 251,946  | 0.39      | 20,870  | 1,415                | 58,032   | 0.33      | 43,075   | 6,806                | 563,198   | 0.22      |  |

<sup>a</sup> Kenai harvest is the estimated harvest of coho salmon of Kenai River origin.

**1994**

**1993**

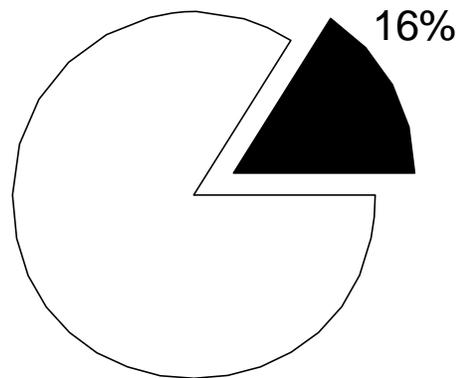
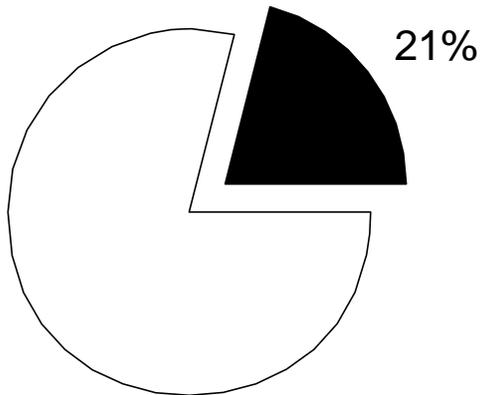
**Central District Drift Gillnet Fishery**



Total Harvest = 303,935

Total Harvest = 121,785

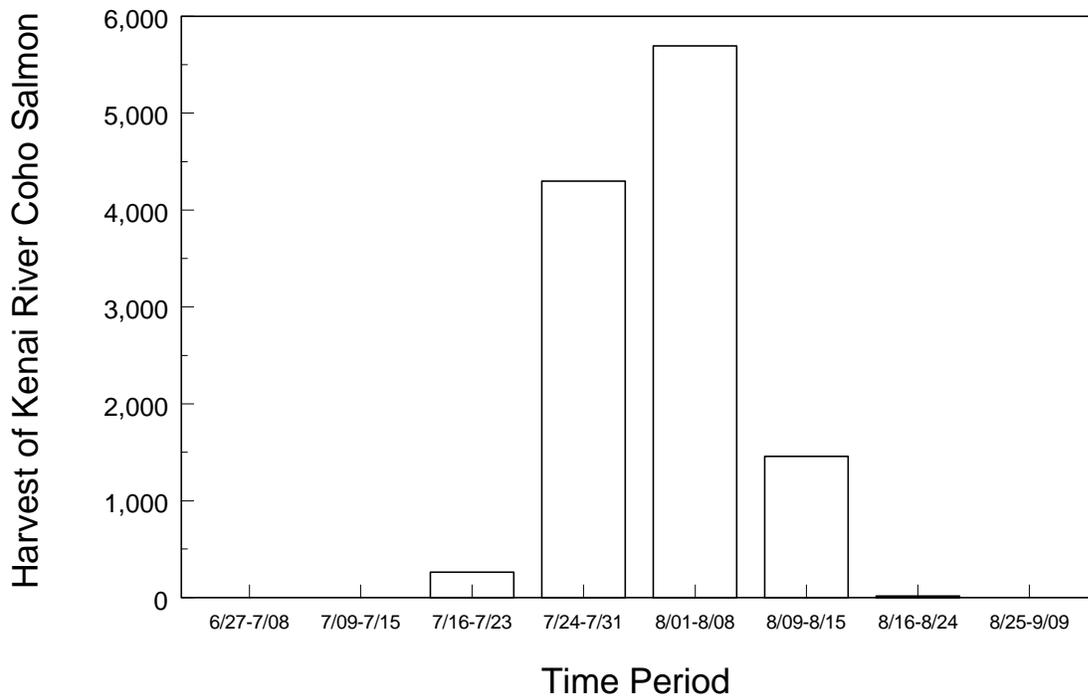
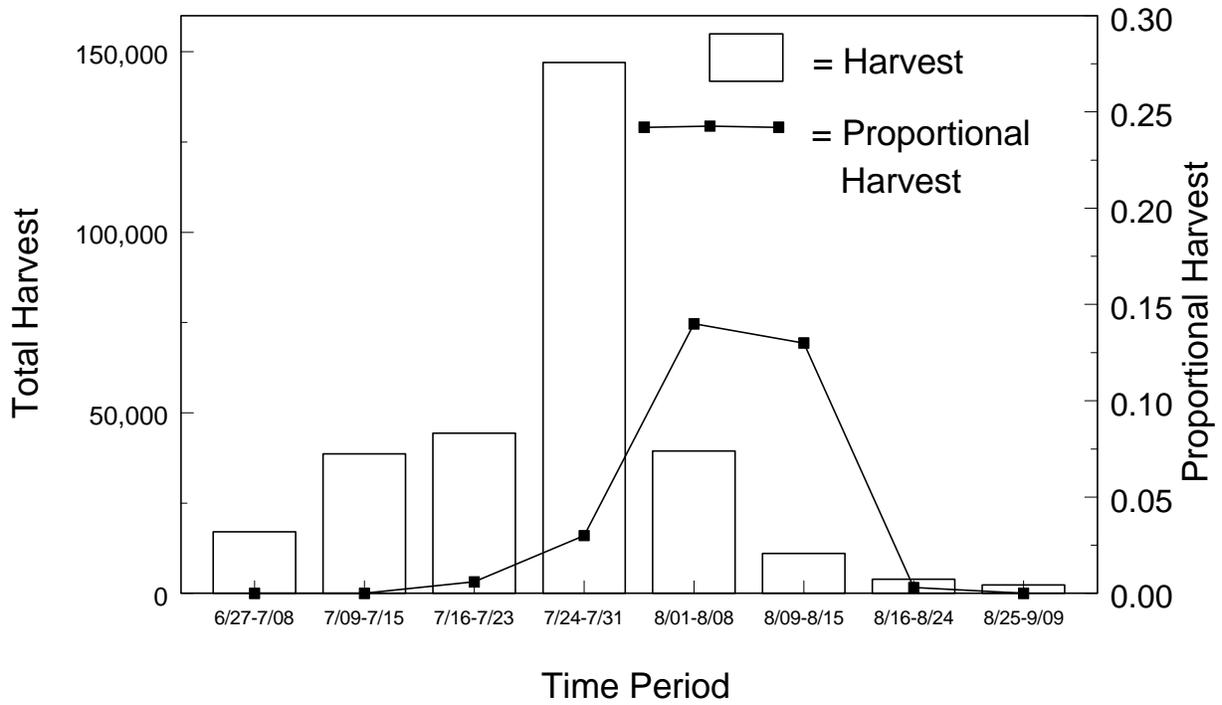
**Central District East Side Set Gillnet Fishery**



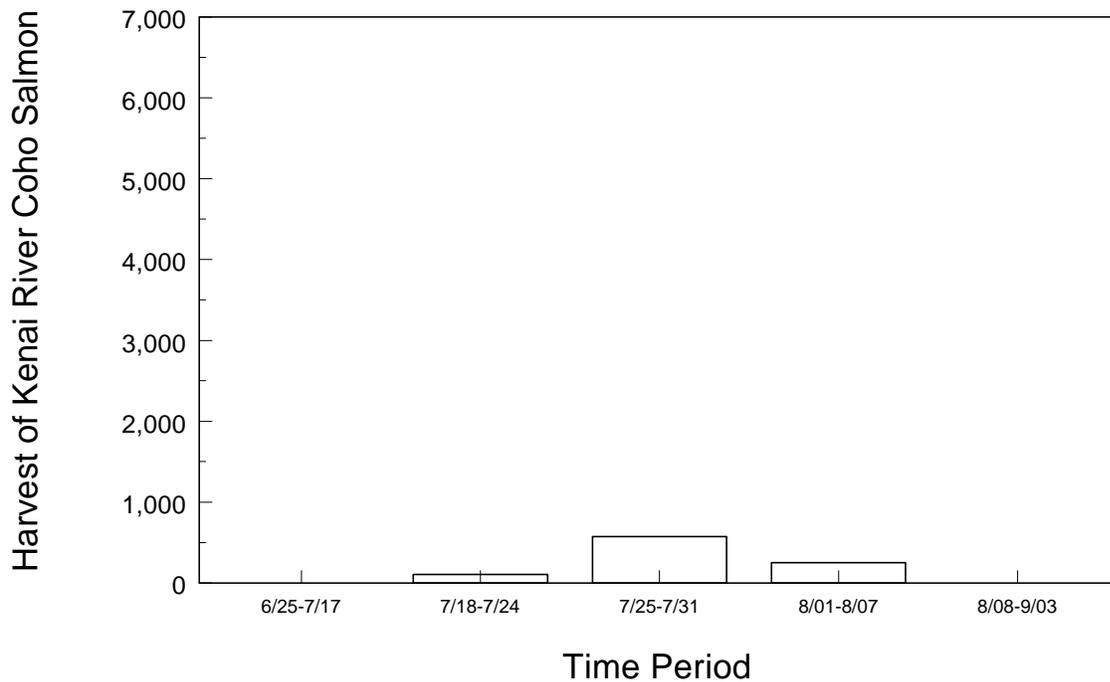
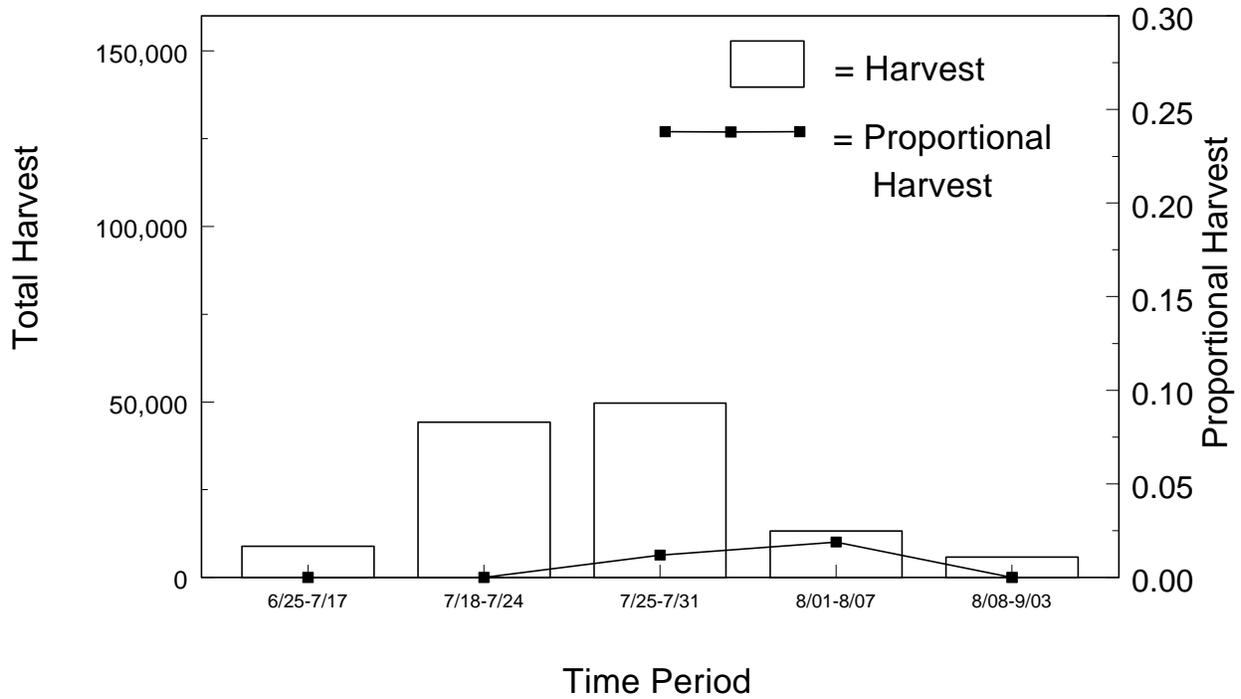
Total Harvest = 69,281

Total Harvest = 43,075

**Figure 9.-Contribution of coho salmon of Kenai River origin to the drift gillnet and eastside set gillnet fisheries of the Central District of Upper Cook Inlet, 1993-1994.**



**Figure 10.-Trend in proportional contribution of coho salmon of Kenai River origin to the total harvest (top) and harvest of coho salmon of Kenai River origin (bottom) in the drift gillnet fishery of the Central District of Upper Cook Inlet, 1994.**



**Figure 11.-Trend in proportional contribution of coho salmon of Kenai River origin to the total harvest (top) and harvest of coho salmon of Kenai River origin (bottom) in the drift gillnet fishery of the Central District of Upper Cook Inlet, 1993.**

accounted for 5% (3,598 coho salmon) of the total harvest. In general, coho salmon from the Kenai River composed a greater portion of the harvests later in the season in both 1994 (Figure 12) and 1993 (Figure 13). The highest absolute harvests occurred during the first week of August in all statistical areas during both years with the exception of statistical area 244-21 in 1993.

There was an increasing trend in the portion of the harvest comprised of coho salmon from the Kenai River and a decreasing trend in total harvest from the northernmost statistical area to the southernmost (Figure 14). However, the absolute harvest of Kenai River coho salmon was relatively similar among statistical areas within years.

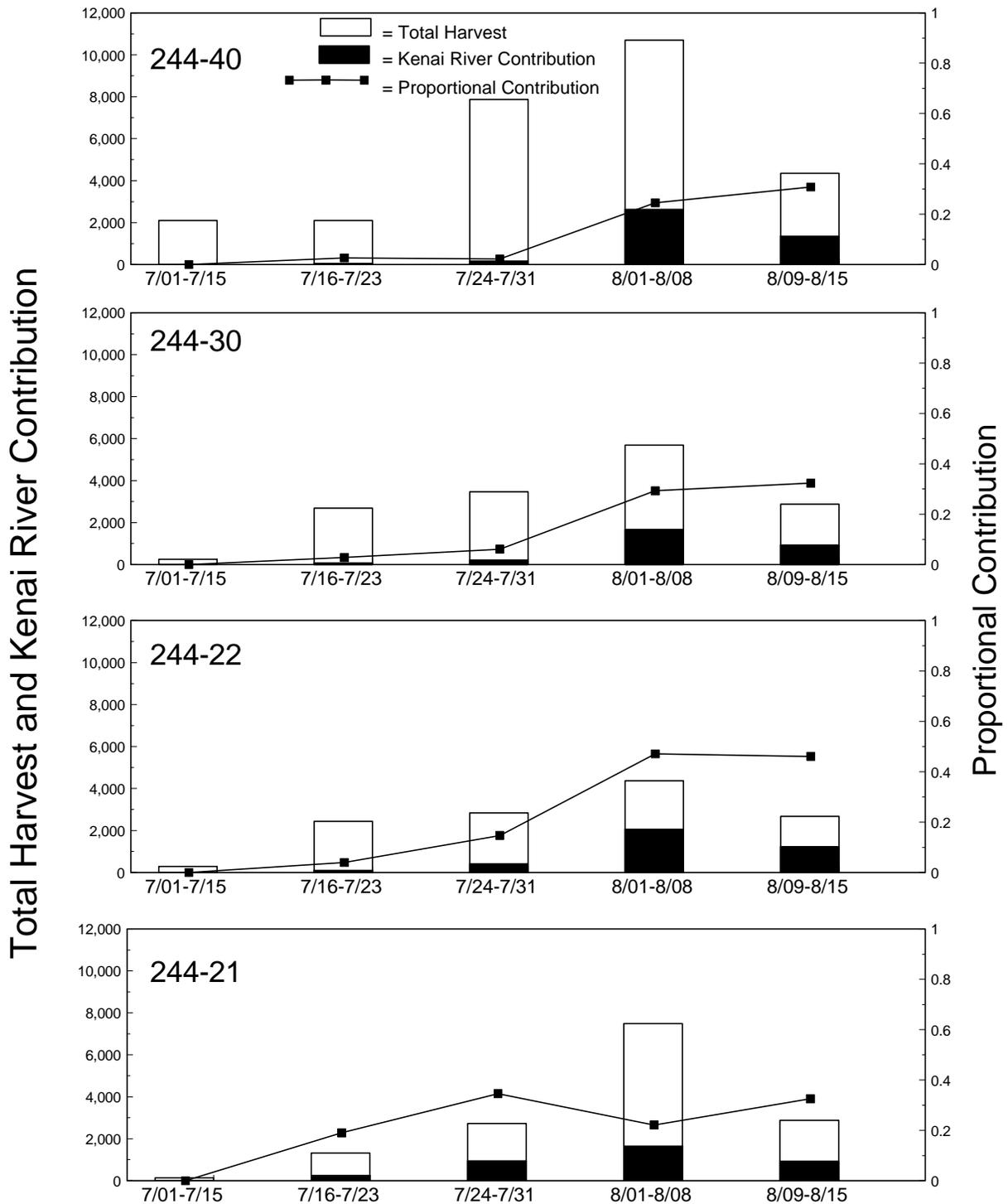
## DISCUSSION

### HARVEST ESTIMATES

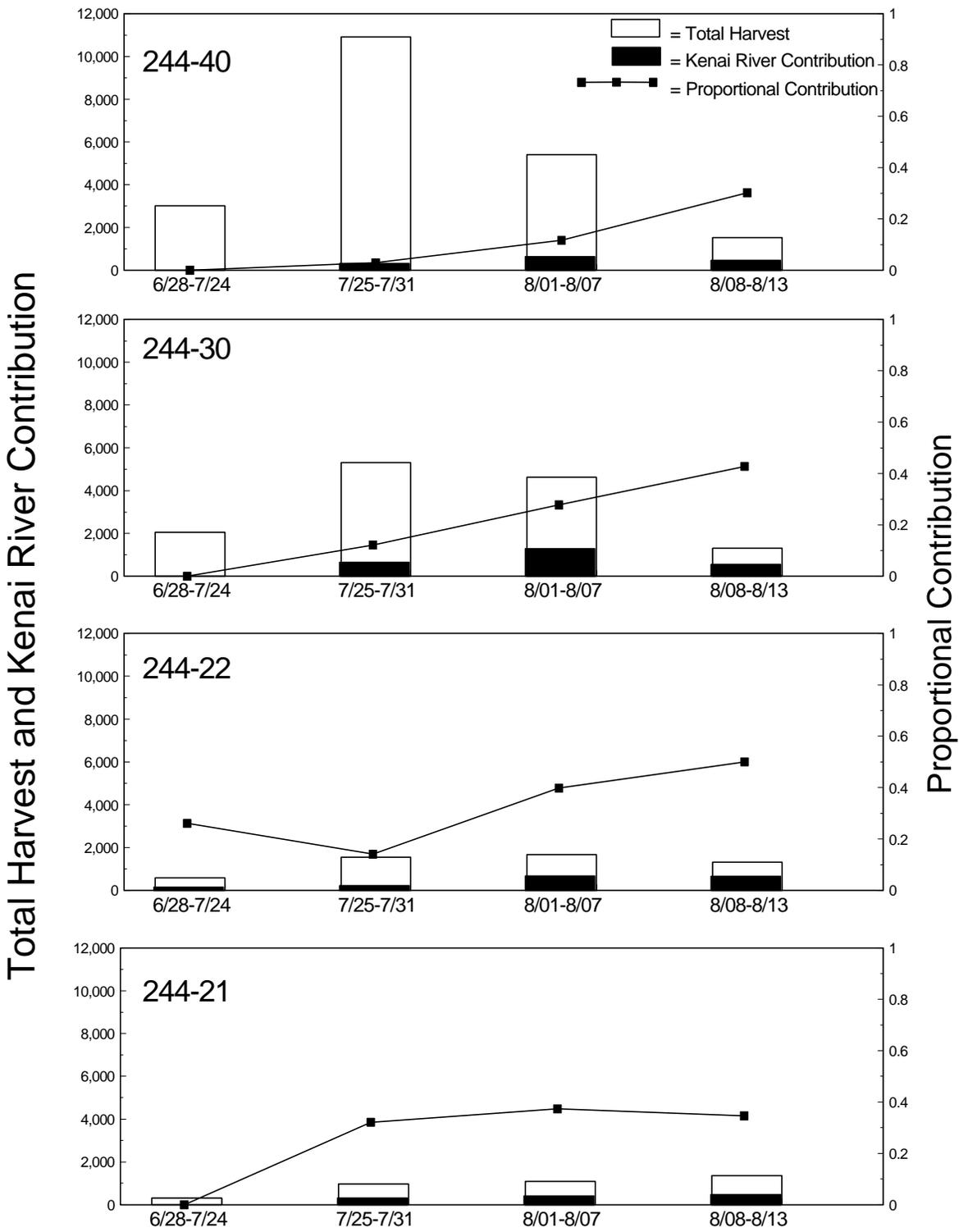
The combined commercial harvest of almost 26,500 coho salmon of Kenai River origin in 1994 approached the long-term average inriver sport harvest of 43,000 (Mills 1979-1994; Howe et al. 1995). However, the commercial harvest was substantially lower than the estimated inriver sport harvest of 86,700 fish in 1994 (Howe et al. 1995). The commercial harvest (7,700) of coho salmon of Kenai River origin was also comparatively lower than the inriver harvest (50,500) in 1993. These estimates provide an indication of the potential of each fishery to harvest coho salmon of Kenai River origin. Prior to 1993, it was assumed that the number of coho salmon from the Kenai River harvested commercially was substantially greater than the inriver sport harvest. The 1993 and 1994 estimates of stock-specific commercial harvests indicate that this is not the case.

When developing the stock assessment program, it was postulated that coho salmon from the Kenai River comprised an average of 40% of the drift gillnet harvest and 70% of the eastside set gillnet harvest (Meyer et al. *Unpublished*). Based on this level of commercial harvest we also assumed that the annual commercial harvest of coho salmon from the Kenai River exceeded the inriver sport harvest. This did not occur in 1993 nor in 1994. The relative contribution of Kenai River stocks to the drift gillnet fishery (1% in 1993 and 4% in 1994) and the eastside set gillnet fishery (16% in 1993 and 21% in 1994) was lower than expected. Hatchery-produced stocks also comprised a minor portion of the commercial harvests in 1993 (Hoffmann and Hasbrouck 1994) and 1994 (Barry Stratton, Alaska Department of Fish and Game, Anchorage, personal communication). Therefore, the majority of the commercial harvest was comprised of wild stocks of unknown origin.

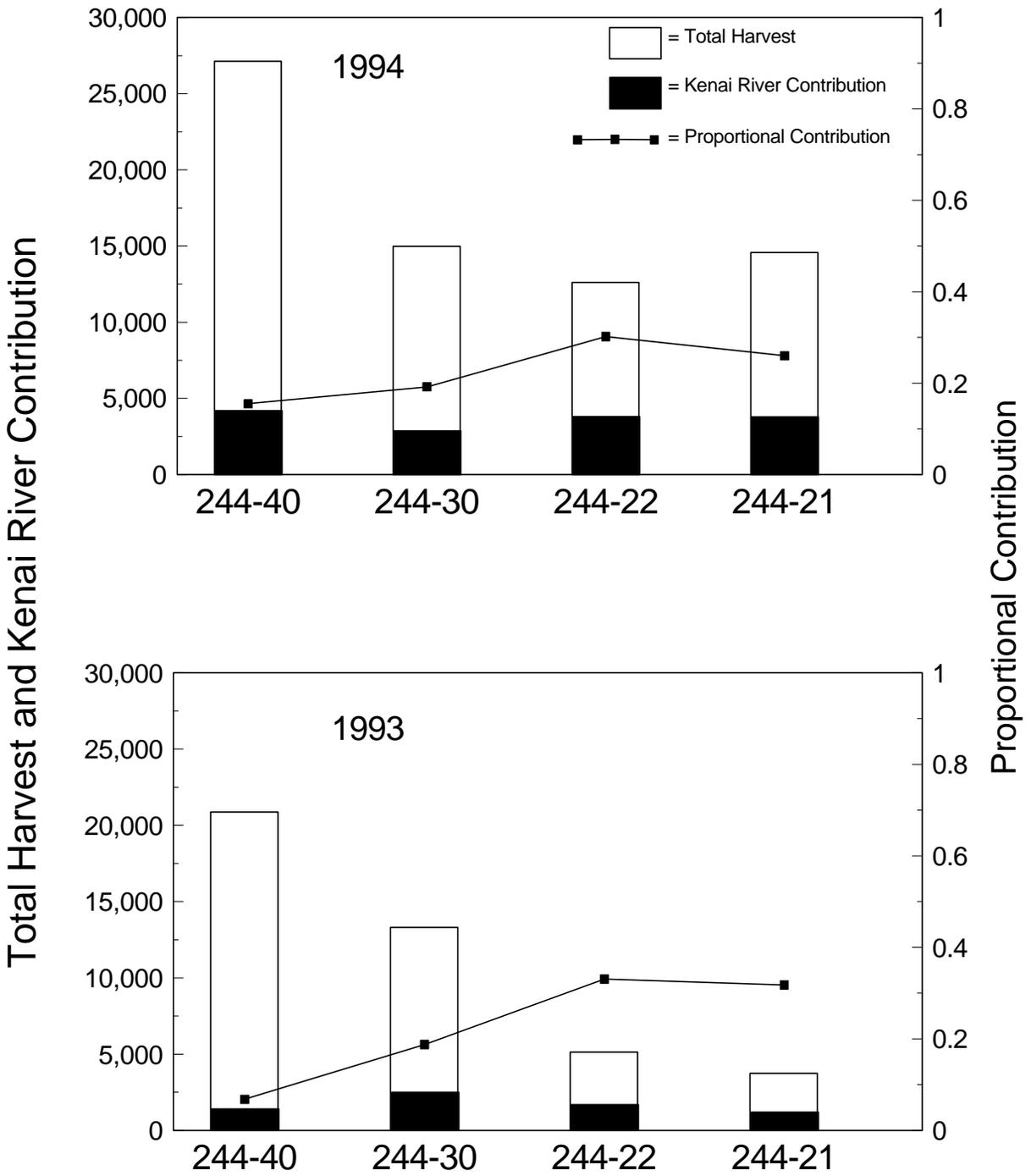
Estimates of relative and absolute harvest of coho salmon of Kenai River origin in both commercial fisheries were higher in 1994 than in 1993. The drift gillnet harvest of about 12,000 fish was 12.5 times greater than the 1993 harvest of about 1,000 fish. Similarly, the estimated set gillnet harvest of about 15,000 fish in 1994 was 2 times greater than the estimated harvest of 6,800 occurring in 1993. These estimates provide the first indication of the potential variability in the harvest of Kenai River stocks. Although the relative contribution of the Kenai River to commercial harvests may be inherently low, there is likely a relationship between the absolute contribution and the timing of area closures in the fisheries. The increase in harvest from 1993 to 1994 indicates that this may be the case. For example, there were more periods open to fishing



**Figure 12.-Trends in proportional and absolute contribution of coho salmon of Kenai River origin to the total harvest of coho salmon occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery during selected time periods in 1994.**



**Figure 13.-Trends in proportional and absolute contribution of coho salmon of Kenai River origin to the total harvest of coho salmon occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery during selected time periods in 1993.**



**Figure 14.-Absolute contribution of coho salmon of Kenai River origin relative to total harvest occurring in four statistical areas of the Upper Cook Inlet Central District eastside set gillnet fishery, 1993-1994.**

in the eastside set gillnet fishery during late July and early August in 1994 relative to 1993 to efficiently harvest a late return of sockeye salmon to the Kenai River.

The Upper Cook Inlet Salmon Management Plan directs the Department of Fish and Game to manage sockeye salmon fisheries such that the incidental harvest of coho salmon bound for the Kenai River is minimized to an extent consistent with other goals of the plan. Currently, fishery managers deduce the presence of coho salmon stocks in fishery areas using timing information (Paul Ruesch, Alaska Department of Fish and Game, Soldotna, personal communication). An analysis of the relationship between stock-specific harvests and area closures based on recoveries of coded wire tags would provide managers with a new source of information with which to manage these fisheries. After 1995 recoveries are summarized, 3 years of information will be available for such an analysis.

Without concurrent estimates of spawning escapement, exploitation by commercial and sport fisheries is still unknown. The overall goal of this assessment program, which is to estimate sustained yield, cannot be achieved without examining the long-term relationship between fishing mortality and production. In lieu of adult escapement estimates, smolt estimates will provide insights on the level and variability of juvenile production. In addition, determining if a relationship exists between annual fishing mortality and smolt production of that return year will require several more years of this marking and mark-recovery program.

### **SAMPLING PERFORMANCE**

Estimates of the commercial harvest of coho salmon from the Kenai River were more precise in 1994 than 1993. This occurred because more juveniles were released with coded wire tags, more adult fish were sampled for marks in the inriver sport fishery, and a similar, though lower, proportion of the commercial harvest was sampled for marks in both commercial fisheries. The reduction in the proportion of the commercial harvest sampled between years occurred because of the substantial increase in the overall harvest in 1994. To ensure that estimates in future years remain relatively precise, approximately 20%-25% of the drift gillnet harvest and 15%-20% of the eastside set gillnet harvest should be sampled. This level of sampling was achieved in 1994, but the reduction indicates that the annual variability in harvest level may require additional samplers during peak harvest periods. Maintaining this level of sampling and continued sampling of all major processors throughout the season will minimize potential sources of bias.

The inriver sport harvest occurring in the lower 34 km of the Kenai River was sampled throughout August and September. Because the creel survey was discontinued in 1993, there is no estimate of total harvest for this river section during these 2 months and, therefore, no estimate of the portion of the harvest examined. However, the purpose of examining the sport harvest is to determine if a representative sample of smolt were marked and, if so, to provide an accurate and precise estimate of the proportion of the run bearing marks. Accuracy is assumed because smolt marked at the Moose River were a representative sample of coho salmon from the Kenai River (recoveries of tags from the inriver sport harvest did not change dramatically over time for fish marked at the Moose River). The relative precision of the estimated proportion marked was  $\leq 10\%$  during each year. This level of precision was adequate; commercial harvest and smolt estimates were within acceptable precision levels. The current level of inriver sampling effort is therefore considered satisfactory.

## **FISHERY TRENDS**

The management plan directive to minimize the incidental harvest of Kenai River coho salmon stocks before August 15 has historically been implemented in the absence of quantitative harvest information. General harvest trends were presented in this report to provide an additional source of information for fishery managers.

In both fisheries, coho salmon of Kenai River origin were present during most of the fishing season, but contributed the greatest number of fish to the harvest during 2-week periods. In the drift gillnet fishery, harvest during the last week of July and the first week of August accounted for most of the harvest, both total and of fish from the Kenai River, in both years. Although most of the harvest in the set gillnet fishery occurred the last week of July and the first 2 weeks of August, the majority of the harvest of fish from the Kenai River occurred during the first 2 weeks of August; relatively few fish were harvested during the last week of July. The only exception to this general pattern was in the southern-most statistical area, 244-21, where harvest of fish from the Kenai River was similar the last week of July and the second week of August.

## **JUVENILE MARKING AND SMOLT ESTIMATES**

Coho salmon smolt tagged at the Moose River was the only marked group used to estimate commercial harvest of Kenai River coho salmon in 1993 and 1994. Sufficient numbers of tagged adults were recovered from the inriver sport harvest to estimate the marked proportion of the cohort. In addition, the consistency of the marked proportion during August and September indicates that smolt emigrating from the Moose River were representative of Kenai River stocks with respect to return timing. This is a requirement associated with estimating both commercial harvest and annual smolt production.

Long-term smolt-to-adult tag loss was not an impediment to estimating commercial harvest of Kenai River coho salmon in 1994. High tag loss rates would require either that more juveniles be marked or that a greater portion of the commercial harvest be examined to maintain levels of precision. Tag loss likely did result in a 1993 smolt abundance estimate that is biased somewhat high. However, the tag loss rate of 2% in the 1994 adult return was an improvement over the tag loss rate of 9% observed during the 1993 return and is therefore considered an insignificant source of bias. Reduction in tag loss was likely due to the sorting of smolt by size class prior to tagging with an optimum-sized injector headmold. This practice should be continued in the future.

The estimated variance of smolt abundance is biased low; abundance estimates appear more precise than they truly are. Because the head was not always collected from an adult coho salmon in the sport harvest that was missing the adipose fin, the number of fish marked at the Moose River that were actually observed in the sport harvest was estimated; otherwise the abundance estimates would be biased high. Variability due to estimating the number of fish tagged at the Moose River was not included in the variance of abundance. With the large sample sizes from the sport harvest and the preponderance of fish tagged at the Moose river among heads actually collected, the bias in the estimated variance is likely small.

Smolt production will be estimated annually and any relationship between fishing mortality (commercial and sport harvest) and smolt production will be examined in the future. Because

several years of data will be needed to detect a relationship, this approach to monitoring production should be considered a long-term endeavor.

## **RECOMMENDATIONS**

### **1. Continue estimating commercial harvest until total return information is available.**

Harvest estimates should continue to be made on an annual basis as part of the Kenai River stock assessment program because these estimates will aid in commercial fishery management decisions and refinement of fish marking objectives. An analysis of any relationship between smolt production and harvest of returning adults may obviate estimates of escapement.

### **2. Continue marking coho salmon smolt at the Moose River.**

The Moose River has provided an abundant source of smolt to mark and is the only site to date that provided a representative sample of Kenai River coho salmon.

### **3. Evaluate smolt marking and adult recovery objectives.**

Allocation of funds between smolt marking and recovery efforts should be optimized based on the relative logistics and costs of each program. The evaluation should be completed before smolt marking begins in the spring of 1996.

### **4. Determine if a relationship exists between harvest of coho salmon and timing of fishery area closures.**

This will provide fishery managers with a new source of information with which to evaluate the effect of management actions on the harvest of coho salmon of Kenai River origin.

## **ACKNOWLEDGMENTS**

The following people assisted with the smolt marking. Jerry Strait and Jeff Breakfield provided training for project staff in the use of coded wire tagging equipment. They also provided field supervision at the Moose River and Hidden Creek weirs. Patti Berkahn, Earl Chauvin, Wendy Langston, Jan Rumble, Kurt Strausbaugh, and Troy Tydingco provided logistical support and marked smolt and fingerling. Soldotna Sport Fish staff provided additional logistical support. Staff of the Cook Inlet Aquaculture Association operated the Hidden Creek weir.

The following people assisted with the recovery of marked adults. The commercial harvest was examined by technicians of the Commercial Fisheries Management and Development Division. Dave Waltemyer and Kim Rudge supervised commercial harvest sampling, provided logistical support, and collated commercial sampling data. Ed Borden, Jenny Johnson, and Phyllis McCutchan sampled the sport harvest. Mary Schwager-King provided logistical support. Terry Bendock and Steve Hammarstrom provided guidance, insight, and logistical support throughout the project. Scott Meyer, Doug Vincent-Lang, and Doug McBride provided the vision to initiate the project.

Jim and Jane Fellman and family granted convenient access to the Moose River through their property. Jeff and Pam Breakfield and family provided convenient access to the Kenai River.

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**APPENDIX A. TAG RECOVERY DATA FROM THE KENAI  
RIVER SPORT HARVEST IN 1994 AND THE COOK INLET  
COMMERCIAL HARVEST IN 1993 AND 1994**

**Appendix A1.-Sources of marked coho salmon adults recovered from the Kenai River sport harvest during August through September, 1994, as determined from coded wire tags.**

| Date          | Number Examined | Marked        | Marked         | CWT Missing | Release Location and Year of Release |          |           |                   |         |                   |                   |                   |                   |
|---------------|-----------------|---------------|----------------|-------------|--------------------------------------|----------|-----------|-------------------|---------|-------------------|-------------------|-------------------|-------------------|
|               |                 | Fish Observed | Fish Recovered |             | Moose R                              | Skilak L | Hidden Cr | Skilak L          | Kenai L | Bird Cr           | Crooked Cr        | Ship Cr           | Moose R           |
|               |                 |               |                |             | 1993                                 | 1992     | 1993      | 1991 <sup>a</sup> | 1992    | 1993 <sup>b</sup> | 1993 <sup>b</sup> | 1993 <sup>b</sup> | 1994 <sup>c</sup> |
| <u>Random</u> |                 |               |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/01         | 17              | 4             | 4              |             | 3                                    |          |           | 1                 |         |                   |                   |                   |                   |
| 08/02         | 6               | 0             |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/03         | 5               | 0             |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/04         | 0               |               |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/05         | 20              | 6             | 6              |             | 4                                    |          |           | 2                 |         |                   |                   |                   |                   |
| 08/06         | 18              | 0             |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/07         | 7               | 1             | 1              |             |                                      |          | 1         |                   |         |                   |                   |                   |                   |
| 08/08         | 2               | 0             |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/09         | 18              | 1             | 1              |             | 1                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/10         | 26              | 6             | 6              |             | 6                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/11         | 84              | 10            | 9              |             | 7                                    | 1        |           | 1                 |         |                   |                   |                   |                   |
| 08/12         | 182             | 25            | 21             |             | 15                                   | 4        |           | 1                 |         |                   |                   |                   | 1                 |
| 08/13         | 142             | 14            | 8              |             | 8                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/14         | 133             | 18            | 12             | 1           | 9                                    |          |           | 1                 |         |                   | 1                 |                   |                   |
| 08/15         | 134             | 12            | 10             |             | 10                                   |          |           |                   |         |                   |                   |                   |                   |
| 08/16         | 14              | 0             |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| 08/17         | 112             | 13            | 5              |             | 5                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/18         | 161             | 10            | 7              |             | 7                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/19         | 136             | 21            | 17             | 1           | 15                                   |          |           | 1                 |         |                   |                   |                   |                   |
| 08/20         | 153             | 18            | 13             |             | 11                                   |          |           | 1                 | 1       |                   |                   |                   |                   |
| 08/21         | 100             | 10            | 8              |             | 6                                    |          |           | 1                 |         | 1                 |                   |                   |                   |
| 08/22         | 77              | 11            | 10             |             | 9                                    |          |           | 1                 |         |                   |                   |                   |                   |
| 08/23         | 105             | 7             | 5              |             | 5                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/24         | 140             | 20            | 14             |             | 12                                   | 1        |           |                   | 1       |                   |                   |                   |                   |
| 08/25         | 175             | 15            | 8              |             | 6                                    | 1        |           | 1                 |         |                   |                   |                   |                   |
| 08/26         | 152             | 10            | 8              |             | 7                                    | 1        |           |                   |         |                   |                   |                   |                   |
| 08/27         | 161             | 21            | 12             |             | 12                                   |          |           |                   |         |                   |                   |                   |                   |
| 08/28         | 130             | 15            | 13             |             | 12                                   | 1        |           |                   |         |                   |                   |                   |                   |
| 08/29         | 97              | 8             | 8              | 3           | 5                                    |          |           |                   |         |                   |                   |                   |                   |
| 08/30         | 108             | 7             | 7              |             | 6                                    |          |           | 1                 |         |                   |                   |                   |                   |
| 08/31         | 0               |               |                |             |                                      |          |           |                   |         |                   |                   |                   |                   |
| August Total  | 2,615           | 283           | 213            | 5           | 181                                  | 10       | 10        | 3                 | 1       | 1                 | 1                 | 0                 | 1                 |

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Appendix A1.-Page 2 of 4.

| Date                      | Number Examined | Marked   | Marked    | CWT Missing | Release Location and Year of Release |          |           |                   |         |                   |                   |                   |                   |   |
|---------------------------|-----------------|----------|-----------|-------------|--------------------------------------|----------|-----------|-------------------|---------|-------------------|-------------------|-------------------|-------------------|---|
|                           |                 | Fish     | Fish      |             | Moose R                              | Skilak L | Hidden Cr | Skilak L          | Kenai L | Bird Cr           | Crooked Cr        | Ship Cr           | Moose R           |   |
|                           |                 | Observed | Recovered |             | 1993                                 | 1992     | 1993      | 1991 <sup>a</sup> | 1992    | 1993 <sup>b</sup> | 1993 <sup>b</sup> | 1993 <sup>b</sup> | 1994 <sup>c</sup> |   |
| <u>Random (continued)</u> |                 |          |           |             |                                      |          |           |                   |         |                   |                   |                   |                   |   |
| 09/01                     | 90              | 9        | 6         |             | 6                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/02                     | 162             | 19       | 16        |             | 14                                   |          |           | 1                 | 1       |                   |                   |                   |                   |   |
| 09/03                     | 155             | 17       | 8         |             | 8                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/04                     | 80              | 9        | 7         |             | 4                                    | 1        |           | 1                 |         |                   |                   |                   | 1                 |   |
| 09/05                     | 29              | 3        | 3         |             | 3                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/06                     | 72              | 13       | 8         |             | 8                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/07                     | 83              | 5        | 5         |             | 4                                    |          |           |                   | 1       |                   |                   |                   |                   |   |
| 09/08                     | 111             | 9        | 9         |             | 9                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/09                     | 206             | 21       | 16        | 1           | 15                                   |          |           |                   |         |                   |                   |                   |                   |   |
| 09/10                     | 222             | 25       | 17        |             | 15                                   | 2        |           |                   |         |                   |                   |                   |                   |   |
| 09/11                     | 151             | 22       | 13        |             | 11                                   | 1        |           | 1                 |         |                   |                   |                   |                   |   |
| 09/12                     | 205             | 39       | 31        | 2           | 25                                   | 2        |           | 2                 |         |                   |                   |                   |                   |   |
| 09/13                     | 26              | 0        |           |             |                                      |          |           |                   |         |                   |                   |                   |                   |   |
| 09/14                     | 132             | 21       | 6         |             | 6                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/15                     | 79              | 8        | 4         |             | 3                                    | 1        |           |                   |         |                   |                   |                   |                   |   |
| 09/16                     | 153             | 28       | 25        | 1           | 21                                   | 1        |           | 2                 |         |                   |                   |                   |                   |   |
| 09/17                     | 107             | 14       | 4         |             | 3                                    | 1        |           |                   |         |                   |                   |                   |                   |   |
| 09/18                     | 47              | 3        | 3         |             | 1                                    | 2        |           |                   |         |                   |                   |                   |                   |   |
| 09/19                     | 104             | 15       | 11        |             | 10                                   | 1        |           |                   |         |                   |                   |                   |                   |   |
| 09/20                     | 87              | 8        | 8         |             | 7                                    |          |           | 1                 |         |                   |                   |                   |                   |   |
| 09/21                     | 32              | 6        | 6         | 1           | 5                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/22                     | 137             | 23       | 19        | 1           | 16                                   | 2        |           |                   |         |                   |                   |                   |                   |   |
| 09/23                     | 80              | 13       | 12        |             | 9                                    | 3        |           |                   |         |                   |                   |                   |                   |   |
| 09/24                     | 91              | 13       | 13        | 1           | 10                                   | 2        |           |                   |         |                   |                   |                   |                   |   |
| 09/25                     | 42              | 6        | 5         |             | 4                                    | 1        |           |                   |         |                   |                   |                   |                   |   |
| 09/26                     | 33              | 3        | 3         |             | 3                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/27                     | 28              | 4        | 3         |             | 2                                    |          |           | 1                 |         |                   |                   |                   |                   |   |
| 09/28                     | 0               |          |           |             |                                      |          |           |                   |         |                   |                   |                   |                   |   |
| 09/29                     | 27              | 4        | 3         |             | 3                                    |          |           |                   |         |                   |                   |                   |                   |   |
| 09/30                     | 9               | 1        |           |             |                                      |          |           |                   |         |                   |                   |                   |                   |   |
| September Total           | 2,780           | 361      | 264       | 7           | 225                                  | 20       |           | 9                 | 2       | 0                 | 0                 | 0                 | 1                 | 0 |
| Random Grand Total        | 5,395           | 644      | 477       | 12          | 406                                  | 30       |           | 19                | 5       | 1                 | 1                 | 1                 | 1                 | 1 |

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Appendix A1.-Page 3 of 4.

| Date                         | Number Examined | Marked        | Marked         | CWT Missing | Release Location and Year of Release |               |                |                            |              |                           |                              |                           |                           |
|------------------------------|-----------------|---------------|----------------|-------------|--------------------------------------|---------------|----------------|----------------------------|--------------|---------------------------|------------------------------|---------------------------|---------------------------|
|                              |                 | Fish Observed | Fish Recovered |             | Moose R 1993                         | Skilak L 1992 | Hidden Cr 1993 | Skilak L 1991 <sup>a</sup> | Kenai L 1992 | Bird Cr 1993 <sup>b</sup> | Crooked Cr 1993 <sup>b</sup> | Ship Cr 1993 <sup>b</sup> | Moose R 1994 <sup>c</sup> |
| <u>Nonrandom<sup>d</sup></u> |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/01                        |                 |               | 1              |             |                                      | 1             |                |                            |              |                           |                              |                           |                           |
| 08/02                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/03                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/04                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/05                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/06                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/07                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/08                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/09                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/10                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/11                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/12                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/13                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/14                        |                 |               | 3              |             | 3                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/15                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/16                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/17                        |                 |               | 7              |             | 5                                    |               |                | 1                          |              |                           |                              | 1                         |                           |
| 08/18                        |                 |               | 4              |             | 3                                    | 1             |                |                            |              |                           |                              |                           |                           |
| 08/19                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/20                        |                 |               | 6              |             | 6                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/21                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/22                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/23                        |                 |               | 2              |             | 2                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/24                        |                 |               | 5              |             | 5                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/25                        |                 |               | 7              |             | 5                                    | 1             |                | 1                          |              |                           |                              |                           |                           |
| 08/26                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/27                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/28                        |                 |               | 6              |             | 6                                    |               |                |                            |              |                           |                              |                           |                           |
| 08/29                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/30                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 08/31                        |                 |               | 5              |             | 5                                    |               |                |                            |              |                           |                              |                           |                           |
| August Total                 |                 |               | 54             |             | 48                                   | 3             |                | 2                          |              |                           |                              | 1                         |                           |

42

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Appendix A1.-Page 4 of 4.

| Date                         | Number Examined | Marked        |                | CWT Missing | Release Location and Year of Release |               |                |                            |              |                           |                              |                           |                           |
|------------------------------|-----------------|---------------|----------------|-------------|--------------------------------------|---------------|----------------|----------------------------|--------------|---------------------------|------------------------------|---------------------------|---------------------------|
|                              |                 | Fish Observed | Fish Recovered |             | Moose R 1993                         | Skilak L 1992 | Hidden Cr 1993 | Skilak L 1991 <sup>a</sup> | Kenai L 1992 | Bird Cr 1993 <sup>b</sup> | Crooked Cr 1993 <sup>b</sup> | Ship Cr 1993 <sup>b</sup> | Moose R 1994 <sup>c</sup> |
| <u>Nonrandom<sup>d</sup></u> |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/01                        |                 |               | 8              | 1           | 7                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/02                        |                 |               | 3              |             | 3                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/03                        |                 |               | 1              | 1           |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/04                        |                 |               | 5              |             | 4                                    | 1             |                |                            |              |                           |                              |                           |                           |
| 09/05                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/06                        |                 |               | 2              |             | 2                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/07                        |                 |               | 6              |             | 6                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/08                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/09                        |                 |               | 7              |             | 6                                    |               |                | 1                          |              |                           |                              |                           |                           |
| 09/10                        |                 |               | 19             |             | 16                                   | 2             |                | 1                          |              |                           |                              |                           |                           |
| 09/11                        |                 |               | 4              |             | 4                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/12                        |                 |               | 2              | 1           | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/13                        |                 |               | 3              |             | 1                                    |               |                | 2                          |              |                           |                              |                           |                           |
| 09/14                        |                 |               | 7              |             | 7                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/15                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/16                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/17                        |                 |               | 10             |             | 9                                    |               |                | 1                          |              |                           |                              |                           |                           |
| 09/18                        |                 |               | 2              |             | 1                                    |               |                | 1                          |              |                           |                              |                           |                           |
| 09/19                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/20                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/21                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/22                        |                 |               | 4              |             | 3                                    |               |                | 1                          |              |                           |                              |                           |                           |
| 09/23                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/24                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/25                        |                 |               | 3              |             | 3                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/26                        |                 |               | 1              |             | 1                                    |               |                |                            |              |                           |                              |                           |                           |
| 09/27                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/28                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/29                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| 09/30                        |                 |               |                |             |                                      |               |                |                            |              |                           |                              |                           |                           |
| September Total              |                 |               | 92             | 3           | 79                                   | 3             |                | 7                          |              |                           |                              |                           |                           |
| Nonrandom Grand Total        |                 |               | 146            | 3           | 127                                  | 6             |                | 9                          |              |                           |                              | 1                         |                           |

<sup>a</sup> Marked as fingerlings in August and September, 1991.

<sup>b</sup> Three hatchery-produced coho salmon that were recovered in the Kenai River as strays.

<sup>c</sup> Marked as smolt in May and June, 1994.

<sup>d</sup> Nonrandom recoveries are voluntary angler returns to ADF&G personnel and are not used in quantitative calculations.

**Appendix A2.-Kenai River sport harvest recoveries in 1994 of coho salmon adults marked as smolt early in the emigration from the Moose River in 1993.**

| Date of Adult Recovery | Tag Codes and Last Date of Release for Each Unique Code |                   |                   |                   |                   |                   |                  |                  |
|------------------------|---|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|
|                        | 312121<br>5/23/93                                       | 312028<br>5/25/93 | 312029<br>5/27/93 | 312110<br>5/28/93 | 312111<br>5/30/93 | 312108<br>5/31/93 | 312109<br>6/1/93 | 312122<br>6/1/93 |
| 8/1/94                 |   |                   | 1                 |                   |                   |                   |                  |                  |
| 8/5/94                 |   |                   |                   |                   |                   |                   |                  |                  |
| 8/9/94                 |   |                   |                   |                   |                   |                   |                  |                  |
| 8/10/94                | 1   | 1                 |                   | 1                 |                   |                   |                  |                  |
| 8/11/94                |   |                   | 1                 |                   |                   |                   |                  |                  |
| 8/12/94                |   | 1                 |                   | 2                 | 1                 |                   | 1                |                  |
| 8/13/94                |   | 1                 | 1                 | 1                 |                   |                   | 1                | 1                |
| 8/14/94                |   |                   |                   | 1                 | 1                 |                   |                  |                  |
| 8/15/94                |   | 2                 | 1                 |                   | 3                 |                   | 2                |                  |
| Period Total           | 1   | 5                 | 4                 | 5                 | 5                 |                   | 4                | 1                |
| 8/17/94                |   | 1                 | 1                 |                   | 1                 |                   |                  |                  |
| 8/18/94                |   | 1                 |                   | 1                 | 1                 |                   |                  |                  |
| 8/19/94                |   |                   |                   | 2                 | 2                 | 1                 | 2                |                  |
| 8/20/94                |   |                   | 1                 |                   | 1                 |                   |                  | 3                |
| 8/21/94                |   | 1                 | 1                 |                   | 1                 |                   |                  |                  |
| 8/22/94                |   | 1                 | 1                 |                   | 1                 |                   |                  |                  |
| 8/23/94                |   | 1                 |                   |                   |                   |                   |                  |                  |
| 8/24/94                | 1   |                   | 1                 | 1                 | 2                 |                   |                  | 2                |
| 8/25/94                |   |                   | 1                 |                   | 1                 |                   |                  | 1                |
| 8/26/94                |   | 1                 | 1                 | 1                 |                   | 1                 |                  |                  |
| 8/27/94                |   | 1                 |                   | 1                 | 1                 |                   |                  |                  |
| 8/28/94                |   |                   | 4                 |                   |                   | 1                 | 1                |                  |
| 8/29/94                |   |                   |                   | 2                 |                   |                   |                  | 1                |
| 8/30/94                |   | 1                 |                   |                   |                   |                   |                  |                  |
| Period Total           | 1   | 8                 | 11                | 8                 | 12                | 3                 | 3                | 7                |
| 9/1/94                 |   |                   | 1                 |                   | 1                 | 2                 |                  |                  |
| 9/2/94                 |   | 1                 |                   | 2                 | 2                 | 1                 |                  |                  |
| 9/3/94                 |   | 1                 | 1                 |                   | 1                 |                   |                  | 2                |
| 9/4/94                 |   |                   |                   |                   |                   |                   |                  | 1                |
| 9/5/94                 |   |                   | 1                 |                   | 1                 |                   |                  |                  |
| 9/6/94                 |   |                   |                   |                   |                   | 1                 | 1                | 2                |
| 9/7/94                 |   |                   |                   | 1                 | 2                 |                   |                  |                  |
| 9/8/94                 | 1   |                   |                   |                   |                   |                   | 1                |                  |
| 9/9/94                 | 1   | 1                 |                   |                   | 1                 |                   | 2                |                  |
| 9/10/94                |   | 2                 |                   | 2                 | 2                 |                   |                  | 1                |
| 9/11/94                |   | 3                 |                   |                   | 1                 |                   |                  |                  |
| 9/12/94                |   | 2                 |                   |                   | 3                 | 1                 | 1                | 2                |
| 9/14/94                |   |                   | 1                 |                   |                   |                   |                  |                  |
| 9/15/94                |   |                   |                   | 1                 |                   |                   |                  | 1                |
| Period Total           | 2   | 10                | 4                 | 6                 | 14                | 5                 | 5                | 9                |
| 9/16/94                |   |                   | 3                 | 1                 | 2                 |                   | 2                | 1                |
| 9/17/94                |   |                   |                   |                   |                   |                   |                  |                  |
| 9/18/94                |   |                   |                   |                   |                   |                   |                  |                  |
| 9/19/94                |   | 1                 | 2                 |                   |                   |                   |                  |                  |
| 9/20/94                |   | 1                 |                   |                   |                   |                   |                  |                  |
| 9/21/94                |   |                   |                   | 1                 | 1                 |                   |                  |                  |
| 9/22/94                |   |                   |                   | 2                 | 1                 |                   |                  | 2                |
| 9/23/94                |   | 1                 | 1                 | 1                 |                   |                   |                  |                  |
| 9/24/94                |   | 1                 |                   | 1                 |                   |                   | 1                | 1                |
| 9/25/94                |   |                   |                   |                   |                   | 1                 | 2                |                  |
| 9/26/94                |   |                   |                   |                   |                   |                   |                  |                  |
| 9/27/94                |   |                   |                   |                   |                   |                   |                  |                  |
| 9/29/94                |   |                   |                   | 1                 |                   | 1                 |                  |                  |
| Period Total           |   | 4                 | 6                 | 7                 | 4                 | 2                 | 5                | 4                |
| Season Total           | 4   | 27                | 25                | 26                | 35                | 10                | 17               | 21               |

**Appendix A3.-Kenai River sport harvest recoveries in 1994 of coho salmon adults marked as smolt late in the emigration from the Moose River in 1993.**

| Date of Adult Recovery | Tag Codes and Last Date of Release for Each Unique Code |                  |                  |                  |                  |                   |                   |                   |                   |                   |                   |
|------------------------|---|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                        | 312128<br>6/2/93  | 312129<br>6/3/93 | 312130<br>6/5/93 | 312144<br>6/7/93 | 312143<br>6/9/93 | 312208<br>6/10/93 | 312220<br>6/12/93 | 312221<br>6/13/93 | 312222<br>6/15/93 | 312210<br>6/17/93 | 312211<br>6/17/93 |
| 8/1/94                 |   |                  |                  |                  | 2                |                   |                   |                   |                   |                   |                   |
| 8/5/94                 |   | 1                |                  |                  |                  | 1                 | 1                 | 1                 |                   |                   |                   |
| 8/9/94                 |   |                  |                  |                  |                  |                   |                   |                   | 1                 |                   |                   |
| 8/10/94                |   |                  |                  |                  |                  |                   |                   |                   | 3                 |                   |                   |
| 8/11/94                | 4   | 2                |                  |                  |                  |                   |                   |                   |                   |                   |                   |
| 8/12/94                | 2   |                  |                  | 2                |                  | 1                 |                   | 3                 |                   | 2                 |                   |
| 8/13/94                | 1   |                  |                  | 2                |                  |                   |                   |                   |                   |                   |                   |
| 8/14/94                |   | 3                |                  | 1                | 1                | 1                 |                   | 1                 |                   |                   |                   |
| 8/15/94                |   |                  |                  |                  |                  | 1                 |                   |                   | 1                 |                   |                   |
| Period Total           | 7   | 6                |                  | 5                | 3                | 4                 | 1                 | 5                 | 5                 | 2                 |                   |
| 8/17/94                |   | 1                |                  | 1                |                  |                   |                   |                   |                   |                   |                   |
| 8/18/94                |   | 1                |                  | 2                |                  |                   |                   |                   | 1                 |                   |                   |
| 8/19/94                | 2   | 1                | 1                | 2                |                  |                   |                   | 1                 | 1                 |                   |                   |
| 8/20/94                | 2   | 1                | 2                |                  |                  |                   |                   |                   |                   | 1                 |                   |
| 8/21/94                | 1   |                  |                  | 1                | 1                |                   |                   |                   |                   |                   |                   |
| 8/22/94                | 2   |                  |                  |                  |                  |                   |                   | 1                 | 3                 |                   |                   |
| 8/23/94                |   |                  |                  |                  |                  |                   | 1                 |                   | 2                 | 1                 |                   |
| 8/24/94                |   | 1                |                  | 1                | 1                |                   |                   | 2                 |                   |                   |                   |
| 8/25/94                |   |                  |                  |                  |                  |                   |                   | 1                 | 1                 |                   | 1                 |
| 8/26/94                |   |                  |                  |                  | 2                |                   |                   |                   |                   |                   |                   |
| 8/27/94                | 2   | 2                | 1                | 1                |                  |                   | 2                 |                   |                   | 1                 |                   |
| 8/28/94                | 4   |                  |                  |                  |                  |                   |                   | 1                 | 1                 |                   |                   |
| 8/29/94                |   |                  |                  | 1                |                  |                   |                   |                   |                   | 1                 |                   |
| 8/30/94                | 2   |                  | 1                | 1                |                  |                   |                   |                   | 1                 |                   |                   |
| Period Total           | 15  | 7                | 5                | 10               | 4                |                   | 3                 | 6                 | 10                | 4                 | 1                 |
| 9/1/94                 | 1   | 1                |                  |                  |                  |                   |                   |                   |                   |                   |                   |
| 9/2/94                 | 1   | 3                | 2                | 2                |                  |                   |                   |                   |                   |                   |                   |
| 9/3/94                 | 1   | 1                | 1                |                  |                  |                   |                   |                   |                   |                   |                   |
| 9/4/94                 | 2   |                  |                  | 1                |                  |                   |                   |                   |                   |                   |                   |
| 9/5/94                 |   |                  |                  |                  |                  |                   |                   | 1                 |                   |                   |                   |
| 9/6/94                 |   | 1                | 2                |                  |                  |                   |                   | 1                 |                   |                   |                   |
| 9/7/94                 |   |                  |                  |                  |                  |                   | 1                 |                   |                   |                   |                   |
| 9/8/94                 | 2   | 1                | 1                | 1                | 1                |                   |                   | 1                 |                   |                   |                   |
| 9/9/94                 |   | 5                | 1                | 2                |                  | 2                 |                   |                   |                   |                   |                   |
| 9/10/94                |   | 3                | 2                |                  |                  |                   |                   | 2                 |                   |                   | 1                 |
| 9/11/94                | 1   | 1                |                  | 1                | 2                |                   |                   |                   | 2                 |                   |                   |
| 9/12/94                | 1   | 3                | 4                | 1                | 2                |                   |                   | 2                 | 2                 | 1                 |                   |
| 9/14/94                | 1   |                  | 1                |                  |                  |                   |                   | 2                 | 1                 |                   |                   |
| 9/15/94                |   |                  |                  |                  | 1                |                   |                   |                   |                   |                   |                   |
| Period Total           | 10  | 19               | 14               | 8                | 6                | 2                 | 1                 | 9                 | 5                 | 1                 | 1                 |
| 9/16/94                | 3   | 5                |                  | 2                | 1                |                   |                   | 1                 |                   |                   |                   |
| 9/17/94                |   |                  | 1                | 1                | 1                |                   |                   |                   |                   |                   |                   |
| 9/18/94                |   |                  |                  |                  |                  |                   |                   | 1                 |                   |                   |                   |
| 9/19/94                | 1   | 1                | 1                | 1                |                  |                   |                   | 1                 | 1                 | 1                 |                   |
| 9/20/94                | 3   | 2                |                  | 1                |                  |                   |                   |                   |                   |                   |                   |
| 9/21/94                |   | 1                |                  |                  |                  | 1                 |                   |                   | 1                 |                   |                   |
| 9/22/94                | 3   | 2                | 2                |                  | 1                | 1                 | 1                 |                   | 1                 |                   |                   |
| 9/23/94                | 1   |                  |                  |                  |                  |                   |                   | 2                 | 3                 |                   |                   |
| 9/24/94                |   |                  | 2                |                  |                  | 1                 |                   | 2                 | 1                 |                   |                   |
| 9/25/94                |   |                  | 1                |                  |                  |                   |                   |                   |                   |                   |                   |
| 9/26/94                | 2   |                  | 1                |                  |                  |                   |                   |                   |                   |                   |                   |
| 9/27/94                | 1   | 1                |                  |                  |                  |                   |                   |                   |                   |                   |                   |
| 9/29/94                |   |                  | 1                |                  |                  |                   |                   |                   |                   |                   |                   |
| Period Total           | 14  | 12               | 9                | 5                | 3                | 3                 | 1                 | 7                 | 7                 | 1                 |                   |
| Season Total           | 46  | 44               | 28               | 28               | 16               | 9                 | 6                 | 27                | 27                | 8                 | 2                 |

**Appendix A4.-Coho salmon commercial harvest, tag recovery, and estimates of harvest of fish of Moose River origin for Upper Cook Inlet commercial fisheries in 1994.**

| Fishery District   | Fishery       | Statistical Area | Date      | (N)<br>Total Harvest | (n <sub>2</sub> )<br>Number Examined | (a <sub>1</sub> )<br>Adclips Observed | (a <sub>2</sub> )<br>Heads Recovered | (m <sub>1</sub> )<br>Heads with Tags | (m <sub>2</sub> )<br>Decodable Tags | (m <sub>c</sub> )<br>Source = |               |                | Other Kenai River Sources |              |              |                       |           |
|--------------------|---------------|------------------|-----------|----------------------|--------------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|-------------------------------|---------------|----------------|---------------------------|--------------|--------------|-----------------------|-----------|
|                    |               |                  |           |                      |                                      |                                       |                                      |                                      |                                     | 1993                          | Estimate      | Variance       | Hidden C 1993             | Kenai L 1992 | Moose R 1992 | Skilak L<br>1991 1992 |           |
| Central            | Drift         | Combined         | 6/27-7/08 | 17,040               | 3,208                                | 30                                    | 30                                   | 21                                   | 21                                  | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/10      | 38                   | 16                                   | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/11      | 195                  | 15                                   | 1                                     | 1                                    | 1                                    | 1                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/15      | 38,424               | 10,114                               | 143                                   | 141                                  | 118                                  | 118                                 | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/18      | 44,368               | 8,421                                | 146                                   | 144                                  | 123                                  | 123                                 | 5                             | 263           | 13,694         |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/24      | 2,353                | 429                                  | 12                                    | 12                                   | 10                                   | 10                                  | 0                             | 0             | 0              | 1                         |              |              |                       |           |
| Central            | Drift         | Combined         | 7/25      | 53,725               | 11,223                               | 314                                   | 314                                  | 286                                  | 286                                 | 27                            | 1,272         | 62,117         | 2                         | 2            |              |                       | 2         |
| Central            | Drift         | Combined         | 7/26      | 2,196                | 157                                  | 1                                     | 1                                    | 1                                    | 1                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 7/27-7/28 | 56,838               | 9,808                                | 330                                   | 326                                  | 290                                  | 289                                 | 33                            | 1,912         | 116,747        | 4                         | 1            | 2            |                       |           |
| Central            | Drift         | Combined         | 7/29      | 31,919               | 6,424                                | 228                                   | 210                                  | 188                                  | 188                                 | 21                            | 1,115         | 60,719         | 2                         |              |              |                       | 2         |
| Central            | Drift         | Combined         | 8/01      | 15,385               | 3,364                                | 166                                   | 165                                  | 153                                  | 152                                 | 25                            | 1,140         | 53,617         | 5                         |              |              |                       | 1         |
| Central            | Drift         | Combined         | 8/02      | 1,073                | 341                                  | 21                                    | 21                                   | 20                                   | 20                                  | 9                             | 279           | 8,524          | 1                         |              |              |                       | 3         |
| Central            | Drift         | Combined         | 8/03      | 1,566                | 365                                  | 24                                    | 23                                   | 18                                   | 18                                  | 6                             | 264           | 11,482         | 1                         |              |              |                       |           |
| Central            | Drift         | Combined         | 8/04      | 2,169                | 397                                  | 36                                    | 35                                   | 32                                   | 32                                  | 20                            | 1,106         | 62,640         | 1                         |              |              |                       |           |
| Central            | Drift         | Combined         | 8/05      | 9,011                | 2,006                                | 127                                   | 118                                  | 109                                  | 109                                 | 30                            | 1,428         | 70,926         | 8                         | 1            |              | 1                     | 2         |
| Central            | Drift         | Combined         | 8/06-8/07 | 420                  | 121                                  | 13                                    | 13                                   | 13                                   | 13                                  | 9                             | 294           | 9,494          | 2                         |              |              |                       |           |
| Central            | Drift         | Combined         | 8/08      | 9,819                | 3,718                                | 236                                   | 233                                  | 208                                  | 208                                 | 45                            | 1,185         | 33,072         | 9                         | 1            |              | 2                     | 9         |
| Central            | Drift         | Combined         | 8/12      | 6,202                | 1,861                                | 118                                   | 118                                  | 110                                  | 110                                 | 25                            | 820           | 27,512         | 3                         |              |              |                       | 1         |
| Central            | Drift         | Combined         | 8/15      | 4,889                | 1,204                                | 67                                    | 67                                   | 64                                   | 64                                  | 16                            | 639           | 25,733         |                           |              |              |                       | 2         |
| Central            | Drift         | Combined         | 8/19      | 2,577                | 1,676                                | 37                                    | 37                                   | 37                                   | 37                                  | 1                             | 15            | 210            |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 8/22-8/24 | 1,361                | 166                                  | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | Drift         | Combined         | 8/26-9/09 | 2,367                | 1,389                                | 1                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| <b>Drift Total</b> |               |                  |           | <b>303,935</b>       | <b>66,423</b>                        | <b>2,051</b>                          | <b>2,009</b>                         | <b>1,802</b>                         | <b>1,800</b>                        | <b>272</b>                    | <b>11,732</b> | <b>556,487</b> | <b>39</b>                 | <b>5</b>     | <b>2</b>     | <b>3</b>              | <b>22</b> |
| Central            | East Side Set | 24421            | 7/01-7/15 | 137                  | 12                                   | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/16-7/17 | 106                  | 13                                   | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/18      | 127                  | 21                                   | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/19      | 105                  | 23                                   | 1                                     | 1                                    | 1                                    | 1                                   | 1                             | 45            | 1,980          |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/20      | 257                  | 3                                    | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/21      | 190                  | 7                                    | 0                                     | 0                                    | 0                                    | 0                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/22-7/23 | 539                  | 77                                   | 6                                     | 6                                    | 6                                    | 6                                   | 3                             | 207           | 14,140         |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/24-7/25 | 508                  | 91                                   | 2                                     | 2                                    | 2                                    | 2                                   | 0                             | 0             | 0              |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/26      | 512                  | 61                                   | 5                                     | 5                                    | 5                                    | 5                                   | 3                             | 248           | 20,345         |                           |              |              |                       |           |
| Central            | East Side Set | 24421            | 7/27-7/28 | 1,069                | 101                                  | 7                                     | 7                                    | 5                                    | 5                                   | 3                             | 313           | 32,489         |                           |              |              |                       |           |

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Appendix A4.-Page 2 of 5.

| Fishery District   | Fishery       | Statistical Area | Date      | (N) Total Harvest | (n <sub>2</sub> ) Number Examined | (a <sub>1</sub> ) Adclips Observed | (a <sub>2</sub> ) Heads Recovered | (m <sub>1</sub> ) Heads with Tags | (m <sub>2</sub> ) Decodable Tags | (m <sub>c</sub> ) Source = |              | Harvest Estimate | Variance  | Other Kenai River Sources |          |          |          |
|--------------------|---------------|------------------|-----------|-------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------|--------------|------------------|-----------|---------------------------|----------|----------|----------|
|                    |               |                  |           |                   |                                   |                                    |                                   |                                   |                                  | 1993                       | 1992         |                  |           | 1992                      | 1991     | 1992     | Skilak L |
| Central            | East Side Set | 24421            | 7/29      | 649               | 166                               | 13                                 | 13                                | 12                                | 12                               | 10                         | 385          | 14,734           | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24421            | 8/01      | 733               | 206                               | 6                                  | 6                                 | 2                                 | 2                                | 2                          | 70           | 2,386            |           |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/02      | 1,129             | 296                               | 20                                 | 20                                | 16                                | 15                               | 11                         | 440          | 17,552           | 1         |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/03      | 1,019             | 38                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/04      | 706               | 40                                | 3                                  | 3                                 | 2                                 | 2                                | 1                          | 174          | 30,102           |           |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/05      | 958               | 239                               | 16                                 | 16                                | 13                                | 13                               | 7                          | 276          | 10,752           |           |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/06-8/07 | 1,643             | 63                                | 4                                  | 4                                 | 3                                 | 3                                | 2                          | 513          | 131,365          |           |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/08      | 1,301             | 279                               | 7                                  | 7                                 | 7                                 | 7                                | 4                          | 184          | 8,336            | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24421            | 8/12      | 1,631             | 330                               | 20                                 | 19                                | 19                                | 19                               | 11                         | 563          | 28,894           | 2         |                           |          |          |          |
| Central            | East Side Set | 24421            | 8/15      | 1,253             | 198                               | 9                                  | 9                                 | 8                                 | 8                                | 6                          | 374          | 23,198           |           |                           |          |          |          |
| <b>24421 Total</b> |               |                  |           | <b>14,572</b>     | <b>2,264</b>                      | <b>119</b>                         | <b>118</b>                        | <b>101</b>                        | <b>100</b>                       | <b>64</b>                  | <b>3,792</b> | <b>336,273</b>   | <b>5</b>  | <b>0</b>                  | <b>0</b> | <b>0</b> | <b>2</b> |
| Central            | East Side Set | 24422            | 7/01-7/15 | 286               | 83                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/16-7/17 | 202               | 56                                | 1                                  | 1                                 | 1                                 | 1                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/18      | 156               | 61                                | 3                                  | 3                                 | 1                                 | 1                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/19      | 276               | 78                                | 3                                  | 3                                 | 2                                 | 2                                | 1                          | 35           | 1,190            |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/20      | 239               | 16                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/21      | 492               | 7                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/22      | 629               | 200                               | 7                                  | 7                                 | 5                                 | 5                                | 2                          | 62           | 1,864            |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/23      | 444               | 64                                | 1                                  | 1                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/24      | 484               | 111                               | 3                                  | 3                                 | 3                                 | 3                                | 1                          | 43           | 1,806            |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/25      | 502               | 148                               | 4                                  | 4                                 | 4                                 | 4                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/26      | 213               | 72                                | 3                                  | 3                                 | 3                                 | 3                                | 1                          | 29           | 812              |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/27-7/28 | 1,275             | 247                               | 10                                 | 10                                | 10                                | 10                               | 2                          | 102          | 5,111            |           |                           |          |          |          |
| Central            | East Side Set | 24422            | 7/29      | 359               | 113                               | 15                                 | 15                                | 13                                | 13                               | 9                          | 242          | 6,415            |           |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/01      | 444               | 171                               | 12                                 | 12                                | 12                                | 12                               | 8                          | 204          | 5,080            | 1         |                           |          |          |          |
| Central            | East Side Set | 24422            | 8/02      | 717               | 186                               | 13                                 | 13                                | 11                                | 11                               | 7                          | 266          | 9,977            | 1         |                           |          |          |          |
| Central            | East Side Set | 24422            | 8/03      | 413               | 216                               | 20                                 | 19                                | 17                                | 17                               | 12                         | 238          | 4,598            | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/04      | 609               | 299                               | 24                                 | 24                                | 20                                | 20                               | 15                         | 301          | 5,927            | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/05      | 666               | 140                               | 10                                 | 10                                | 10                                | 10                               | 8                          | 375          | 17,477           | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/06-8/07 | 1,214             | 238                               | 18                                 | 18                                | 17                                | 17                               | 12                         | 602          | 30,338           | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/08      | 304               | 82                                | 4                                  | 4                                 | 4                                 | 4                                | 2                          | 73           | 2,598            |           |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/12      | 1,959             | 191                               | 17                                 | 17                                | 16                                | 16                               | 11                         | 1,110        | 113,390          | 1         |                           |          |          | 1        |
| Central            | East Side Set | 24422            | 8/15      | 721               | 452                               | 33                                 | 33                                | 22                                | 22                               | 8                          | 126          | 1,889            | 3         |                           |          |          | 1        |
| <b>24422 Total</b> |               |                  |           | <b>12,604</b>     | <b>3,231</b>                      | <b>201</b>                         | <b>200</b>                        | <b>171</b>                        | <b>171</b>                       | <b>99</b>                  | <b>3,808</b> | <b>208,472</b>   | <b>10</b> | <b>0</b>                  | <b>0</b> | <b>2</b> | <b>7</b> |
| Central            | East Side Set | 24430            | 7/01-7/15 | 256               | 30                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24430            | 7/16-7/17 | 224               | 3                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0            | 0                |           |                           |          |          |          |
| Central            | East Side Set | 24430            | 7/18      | 381               | 120                               | 4                                  | 4                                 | 4                                 | 4                                | 2                          | 63           | 1,926            |           |                           |          |          |          |
| Central            | East Side Set | 24430            | 7/19      | 171               | 136                               | 2                                  | 2                                 | 2                                 | 2                                | 1                          | 12           | 132              |           |                           |          |          |          |

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Appendix A4.-Page 3 of 5.

| Fishery District           | Fishery       | Statistical Area | Date      | (N) Total Harvest | (n <sub>2</sub> ) Number Examined | (a <sub>1</sub> ) Adclips Observed | (a <sub>2</sub> ) Heads Recovered | (m <sub>1</sub> ) Heads with Tags | (m <sub>2</sub> ) Decodable Tags | (m <sub>c</sub> ) Source = |                  |                  | Other Kenai River Sources |              |              |                    |           |          |  |
|----------------------------|---------------|------------------|-----------|-------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------|------------------|------------------|---------------------------|--------------|--------------|--------------------|-----------|----------|--|
|                            |               |                  |           |                   |                                   |                                    |                                   |                                   |                                  | Moose R 1993               | Harvest Estimate | Variance         | Hidden C 1993             | Kenai L 1992 | Moose R 1992 | Skilak L 1991 1992 |           |          |  |
| Central                    | East Side Set | 24430            | 7/20      | 171               | 10                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/21      | 385               | 8                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/22-7/23 | 1,353             | 926                               | 17                                 | 17                                | 15                                | 15                               | 0                          | 0                | 0                | 2                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/24      | 747               | 18                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/25      | 587               | 11                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/26      | 431               | 77                                | 6                                  | 6                                 | 6                                 | 6                                | 2                          | 110              | 5,954            | 1                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/27-7/28 | 1,295             | 159                               | 3                                  | 3                                 | 3                                 | 3                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 7/29      | 405               | 119                               | 9                                  | 9                                 | 6                                 | 6                                | 3                          | 100              | 3,249            |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/01      | 558               | 107                               | 5                                  | 5                                 | 3                                 | 3                                | 0                          | 0                | 0                |                           |              | 1            |                    |           | 1        |  |
| Central                    | East Side Set | 24430            | 8/02      | 701               | 51                                | 5                                  | 5                                 | 5                                 | 5                                | 3                          | 406              | 54,784           | 1                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/03      | 664               | 70                                | 3                                  | 3                                 | 3                                 | 3                                | 0                          | 0                | 0                | 1                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/04      | 814               | 71                                | 9                                  | 9                                 | 7                                 | 7                                | 1                          | 113              | 12,656           |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/05      | 928               | 72                                | 2                                  | 2                                 | 2                                 | 2                                | 1                          | 127              | 16,002           |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/06-8/07 | 1,555             | 40                                | 4                                  | 4                                 | 4                                 | 4                                | 3                          | 1,022            | 348,800          |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/08      | 476               | 3                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/12      | 1,518             | 10                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24430            | 8/15      | 1,357             | 108                               | 9                                  | 6                                 | 6                                 | 6                                | 5                          | 928              | 172,841          | 1                         |              |              |                    |           |          |  |
| <b>24430 Total</b>         |               |                  |           | <b>14,977</b>     | <b>2,149</b>                      | <b>78</b>                          | <b>75</b>                         | <b>66</b>                         | <b>66</b>                        | <b>21</b>                  | <b>2,881</b>     | <b>616,344</b>   | <b>6</b>                  | <b>1</b>     | <b>0</b>     | <b>1</b>           | <b>0</b>  |          |  |
| Central                    | East Side Set | 24440            | 7/01-7/15 | 2,104             | 438                               | 5                                  | 5                                 | 4                                 | 4                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 7/18      | 2,099             | 771                               | 7                                  | 7                                 | 6                                 | 6                                | 2                          | 54               | 1,407            |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 7/24-7/25 | 3,251             | 172                               | 5                                  | 5                                 | 4                                 | 4                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 7/26      | 1,113             | 31                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 7/27-7/28 | 2,443             | 60                                | 0                                  | 0                                 | 0                                 | 0                                | 0                          | 0                | 0                |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 7/29      | 1,058             | 243                               | 19                                 | 19                                | 17                                | 17                               | 4                          | 171              | 7,189            | 3                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/01      | 1,656             | 251                               | 14                                 | 14                                | 13                                | 13                               | 1                          | 65               | 4,160            |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/02      | 1,327             | 185                               | 5                                  | 5                                 | 5                                 | 5                                | 2                          | 141              | 9,822            |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/03      | 1,877             | 273                               | 10                                 | 10                                | 9                                 | 9                                | 3                          | 203              | 13,595           | 1                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/04      | 1,026             | 160                               | 6                                  | 6                                 | 6                                 | 6                                | 4                          | 252              | 15,731           | 2                         |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/05      | 1,611             | 233                               | 17                                 | 17                                | 16                                | 16                               | 10                         | 681              | 46,623           | 2                         |              |              |                    |           | 2        |  |
| Central                    | East Side Set | 24440            | 8/06-8/07 | 2,212             | 219                               | 10                                 | 10                                | 10                                | 10                               | 9                          | 895              | 89,691           |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/08      | 997               | 126                               | 5                                  | 5                                 | 5                                 | 5                                | 5                          | 389              | 30,145           |                           |              |              |                    |           |          |  |
| Central                    | East Side Set | 24440            | 8/12      | 2,397             | 316                               | 20                                 | 20                                | 17                                | 17                               | 13                         | 971              | 73,490           | 3                         |              |              |                    |           | 1        |  |
| Central                    | East Side Set | 24440            | 8/15      | 1,957             | 52                                | 1                                  | 1                                 | 1                                 | 1                                | 1                          | 370              | 136,531          |                           |              |              |                    |           |          |  |
| <b>24440 Total</b>         |               |                  |           | <b>27,128</b>     | <b>3,530</b>                      | <b>124</b>                         | <b>124</b>                        | <b>113</b>                        | <b>113</b>                       | <b>54</b>                  | <b>4,192</b>     | <b>428,384</b>   | <b>11</b>                 | <b>0</b>     | <b>0</b>     | <b>0</b>           | <b>0</b>  | <b>3</b> |  |
| <b>East Side Set Total</b> |               |                  |           | <b>69,281</b>     | <b>11,174</b>                     | <b>522</b>                         | <b>517</b>                        | <b>451</b>                        | <b>450</b>                       | <b>238</b>                 | <b>14,673</b>    | <b>1,589,473</b> | <b>32</b>                 | <b>1</b>     | <b>0</b>     | <b>3</b>           | <b>12</b> |          |  |

48

-continued-

Appendix A4.-Page 4 of 5.

| Fishery District                            | Fishery           | Statistical Area | Date      | (N) Total Harvest | (n <sub>2</sub> ) Number Examined | (a <sub>1</sub> ) Adclips Observed | (a <sub>2</sub> ) Heads Recovered | (m <sub>1</sub> ) Heads with Tags | (m <sub>2</sub> ) Decodable Tags | (m <sub>c</sub> ) Source = Moose R 1993 | Harvest Estimate | Variance  | Other Kenai River Sources |              |              |                    |    |
|---|-------------------|------------------|-----------|-------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|---|------------------|-----------|---------------------------|--------------|--------------|--------------------|----|
|   |                   |                  |           |                   |                                   |                                    |                                   |                                   |                                  |   |                  |           | Hidden C 1993             | Kenai L 1992 | Moose R 1992 | Skilak L 1991 1992 |    |
| <b>Chinitna Set/Drift Total<sup>a</sup></b> |                   |                  |           | 6,715             | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>Kalgin I. Set Total<sup>a</sup></b>      |                   |                  |           | 26,977            | 2,138                             | 96                                 | 96                                | 85                                | 85                               | 2                                       | 21               | 171       | 0                         | 0            | 0            | 0                  | 0  |
| <b>24520 Total</b>                          |                   |                  |           | 10,251            | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>24530 Total</b>                          |                   |                  |           | 4,589             | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>24540 Total</b>                          |                   |                  |           | 2,161             | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>24550 Total</b>                          |                   |                  |           | 3,152             | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>24555 Total</b>                          |                   |                  |           | 3,409             | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>West Side Set Total<sup>a,b</sup></b>    |                   |                  |           | 23,562            | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| <b>Central Total</b>                        |                   |                  |           | 430,470           | 79,735                            | 2,669                              | 2,622                             | 2,338                             | 2,335                            | 512                                     | 26,453           | 2,146,492 | 71                        | 6            | 2            | 6                  | 34 |
| Northern                                    | East Side Set     | 247-708090       | 6/27-8/01 | 8,603             | 950                               | 40                                 | 40                                | 39                                | 39                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/03      | 1,242             | 488                               | 21                                 | 21                                | 20                                | 20                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/05      | 1,119             | 477                               | 12                                 | 12                                | 12                                | 12                               | 1                                       | 23               | 506       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/08      | 625               | 314                               | 15                                 | 15                                | 13                                | 13                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/12      | 2,433             | 2,204                             | 33                                 | 33                                | 31                                | 31                               | 1                                       | 11               | 110       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/15      | 2,914             | 2,348                             | 48                                 | 48                                | 46                                | 46                               | 1                                       | 12               | 132       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/19      | 5,300             | 4,470                             | 113                                | 112                               | 97                                | 97                               | 2                                       | 24               | 264       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/22      | 2,015             | 1,775                             | 51                                 | 51                                | 47                                | 47                               | 1                                       | 11               | 110       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/26      | 2,107             | 1,970                             | 24                                 | 24                                | 19                                | 19                               | 1                                       | 11               | 110       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 8/29      | 1,359             | 1,290                             | 13                                 | 13                                | 11                                | 11                               | 2                                       | 21               | 200       |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 9/02      | 986               | 902                               | 13                                 | 13                                | 11                                | 11                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | East Side Set     | 247-708090       | 9/05-9/30 | 602               | 113                               | 1                                  | 1                                 | 1                                 | 1                                | 1                                       | 52               | 2,653     |                           |              |              |                    |    |
| <b>East Side Set Total</b>                  |                   |                  |           | 29,305            | 17,301                            | 384                                | 383                               | 347                               | 347                              | 10                                      | 165              | 4,085     | 0                         | 0            | 0            | 0                  | 0  |
| Northern                                    | Fire I. Set       | 24743            | 7/01-7/25 | 2,644             | 759                               | 56                                 | 56                                | 52                                | 52                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 7/29      | 1,613             | 490                               | 26                                 | 21                                | 20                                | 20                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/01-8/03 | 1,764             | 593                               | 67                                 | 67                                | 64                                | 64                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/05      | 1,118             | 144                               | 8                                  | 8                                 | 8                                 | 8                                | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/08      | 277               | 380                               | 46                                 | 46                                | 45                                | 45                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/12      | 1,022             | 504                               | 62                                 | 62                                | 55                                | 55                               | 1                                       | 20               | 380       |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/15      | 321               | 285                               | 49                                 | 49                                | 48                                | 48                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/19      | 893               | 155                               | 25                                 | 25                                | 22                                | 22                               | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Fire I. Set       | 24743            | 8/22-9/02 | 702               | 103                               | 16                                 | 15                                | 14                                | 14                               | 0                                       |                  |           |                           |              |              |                    |    |
| <b>Fire I. Set Total</b>                    |                   |                  |           | 10,354            | 3,413                             | 355                                | 349                               | 328                               | 328                              | 1                                       | 20               | 380       | 0                         | 0            | 0            | 0                  | 0  |
| Northern                                    | Knik Arm Set      | 24750            | 7/26      | 809               | 0                                 |                                    |                                   |                                   |                                  |   |                  |           |                           |              |              |                    |    |
| <b>Knik Arm Set Total</b>                   |                   |                  |           | 809               | 0                                 | 0                                  | 0                                 | 0                                 | 0                                | 0                                       | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| Northern                                    | Pt. MacKenzie Set | 24742            | 7/08-7/18 | 1,905             | 52                                | 0                                  | 0                                 | 0                                 | 0                                | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Pt. MacKenzie Set | 24742            | 7/25      | 875               | 79                                | 9                                  | 9                                 | 7                                 | 7                                | 0                                       |                  |           |                           |              |              |                    |    |
| Northern                                    | Pt. MacKenzie Set | 24742            | 7/29      | 874               | 570                               | 33                                 | 33                                | 32                                | 32                               | 0                                       |                  |           |                           |              |              |                    |    |

-continued-

Appendix A4.-Page 5 of 5.

| Fishery District                                 | Fishery           | Statistical Area | Date      | (N) Total Harvest | (n <sub>2</sub> ) Number Examined | (a <sub>1</sub> ) Adclips Observed | (a <sub>2</sub> ) Heads Recovered | (m <sub>1</sub> ) Heads with Tags | (m <sub>2</sub> ) Decodable Tags | (m <sub>c</sub> ) Source = |                  |           | Other Kenai River Sources |              |              |                    |    |
|--|-------------------|------------------|-----------|-------------------|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------|------------------|-----------|---------------------------|--------------|--------------|--------------------|----|
|  |                   |                  |           |                   |                                   |                                    |                                   |                                   |                                  | Moose R 1993               | Harvest Estimate | Variance  | Hidden C 1993             | Kenai L 1992 | Moose R 1992 | Skilak L 1991 1992 |    |
| Northern   | Pt. MacKenzie Set | 24742            | 8/01-8/03 | 2,552             | 282                               | 19                                 | 19                                | 17                                | 17                               | 17                         | 0                |           |                           |              |              |                    |    |
| Northern   | Pt. MacKenzie Set | 24742            | 8/05-8/08 | 1,336             | 540                               | 34                                 | 34                                | 33                                | 33                               | 33                         | 0                |           |                           |              |              |                    |    |
| Northern   | Pt. MacKenzie Set | 24742            | 8/12      | 536               | 184                               | 12                                 | 12                                | 10                                | 10                               | 10                         | 0                |           |                           |              |              |                    |    |
| Northern   | Pt. MacKenzie Set | 24742            | 8/15      | 561               | 347                               | 19                                 | 19                                | 19                                | 19                               | 19                         | 0                |           |                           |              |              |                    |    |
| Northern   | Pt. MacKenzie Set | 24742            | 8/19-8/26 | 509               | 201                               | 27                                 | 27                                | 25                                | 25                               | 25                         | 0                |           |                           |              |              |                    |    |
| <b>Pt. McKenzie Total</b>                        |                   |                  |           | 9,148             | 2,255                             | 153                                | 153                               | 143                               | 143                              | 0                          | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| Northern   | Susitna Flats     | 24741            | 6/27-7/25 | 634               | 102                               | 4                                  | 4                                 | 3                                 | 3                                | 3                          | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 7/29      | 859               | 618                               | 33                                 | 33                                | 30                                | 30                               | 30                         | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/01-8/03 | 2,242             | 912                               | 81                                 | 81                                | 74                                | 74                               | 74                         | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/05      | 627               | 572                               | 40                                 | 40                                | 36                                | 36                               | 36                         | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/08      | 450               | 61                                | 3                                  | 3                                 | 2                                 | 2                                | 2                          | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/12      | 411               | 484                               | 28                                 | 28                                | 27                                | 27                               | 27                         | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/15      | 329               | 313                               | 19                                 | 19                                | 17                                | 17                               | 17                         | 0                |           |                           |              |              |                    |    |
| Northern   | Susitna Flats     | 24741            | 8/19-9/02 | 528               | 77                                | 7                                  | 7                                 | 7                                 | 7                                | 7                          | 0                |           |                           |              |              |                    |    |
| <b>Susitna Flats Total</b>                       |                   |                  |           | 6,080             | 3,139                             | 215                                | 215                               | 196                               | 196                              | 0                          | 0                | 0         | 0                         | 0            | 0            | 0                  | 0  |
| Northern   | West Side Set     | 247-102030       | 6/27-7/25 | 45,255            | 7,397                             | 48                                 | 48                                | 32                                | 32                               | 2                          | 120              | 7,097     |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 7/29      | 10,803            | 2,132                             | 22                                 | 22                                | 18                                | 18                               | 0                          |                  |           |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/01      | 14,982            | 9,855                             | 199                                | 199                               | 151                               | 151                              | 6                          | 90               | 1,275     |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/03      | 4,504             | 1,896                             | 53                                 | 53                                | 45                                | 45                               | 0                          |                  |           |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/05      | 7,612             | 4,128                             | 104                                | 104                               | 91                                | 91                               | 1                          | 18               | 306       |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/08      | 2,684             | 1,878                             | 95                                 | 95                                | 79                                | 79                               | 3                          | 42               | 549       |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/12      | 3,110             | 2,756                             | 145                                | 145                               | 131                               | 131                              | 2                          | 22               | 221       |                           |              |              | 1                  |    |
| Northern   | West Side Set     | 247-102030       | 8/15      | 2,866             | 1,837                             | 132                                | 132                               | 121                               | 121                              | 0                          |                  |           |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/19-8/22 | 1,735             | 690                               | 35                                 | 35                                | 32                                | 32                               | 0                          |                  |           |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/26      | 448               | 378                               | 9                                  | 9                                 | 9                                 | 9                                | 0                          |                  |           |                           |              |              |                    |    |
| Northern   | West Side Set     | 247-102030       | 8/29      | 402               | 349                               | 6                                  | 6                                 | 5                                 | 5                                | 0                          |                  |           |                           |              |              |                    |    |
| <b>West Side Set Total<sup>c</sup></b>           |                   |                  |           | 94,401            | 33,296                            | 848                                | 848                               | 714                               | 714                              | 14                         | 292              | 9,448     | 0                         | 0            | 1            | 0                  | 0  |
| <b>Northern Total<sup>c</sup></b>                |                   |                  |           | 150,097           | 59,404                            | 1,955                              | 1,948                             | 1,728                             | 1,728                            | 25                         | 477              | 13,913    | 0                         | 0            | 1            | 0                  | 0  |
| <b>Central and Northern District Grand Total</b> |                   |                  |           | 580,567           | 139,139                           | 4,624                              | 4,570                             | 4,066                             | 4,063                            | 537                        | 26,930           | 2,160,405 | 71                        | 6            | 3            | 6                  | 34 |

- <sup>a</sup> Not a target fishery, therefore fishery was not sampled or was sampled incidentally. Daily information is omitted.
- <sup>b</sup> Excludes fish from Central District statistical area 245-60. These were occasionally mixed in tender holds with fish harvested in the westside set gillnet fishery of the Northern District prior to examination. The number harvested and examined from Central District statistical area 245-60 are included with the Northern District westside set gillnet fishery for reporting purposes.
- <sup>c</sup> Includes Central District statistical area 245-60.

**Appendix A5.-Coho salmon commercial harvest, tag recovery, and estimates of harvest of fish of Moose River origin for Upper Cook Inlet commercial fisheries in 1993.**

| Fishery District   | Gillnet Fishery | Statistical Area | Date      | (N)<br>Total Harvest | (n2)<br>Number Examined | (a1)<br>Adclips Observed | (a2)<br>Heads Recovered | (m1)<br>Heads with Tags | (m2)<br>Decodeable Tags | (mc)<br>Source = |                     |          | Other Kenai River Sources |                       |   |
|--------------------|-----------------|------------------|-----------|----------------------|-------------------------|--------------------------|-------------------------|-------------------------|-------------------------|------------------|---------------------|----------|---------------------------|-----------------------|---|
|                    |                 |                  |           |                      |                         |                          |                         |                         |                         | Moose R<br>1992  | Harvest<br>Estimate | Variance | Hidden C<br>1992          | Skilak L<br>1991 1992 |   |
| Central            | Drift           | Combined         | 6/25-7/12 | 3,702                | 795                     | 8                        | 8                       | 3                       | 3                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/13      | 107                  | 29                      | 1                        | 1                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/14      | 322                  | 161                     | 4                        | 4                       | 1                       | 1                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/16      | 3,976                | 1,495                   | 23                       | 22                      | 13                      | 13                      | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/17      | 760                  | 256                     | 3                        | 3                       | 2                       | 2                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/18      | 718                  | 177                     | 5                        | 5                       | 4                       | 4                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/19      | 13,310               | 4,191                   | 49                       | 49                      | 36                      | 36                      | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/20      | 539                  | 218                     | 1                        | 1                       | 1                       | 1                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/21      | 985                  | 428                     | 13                       | 13                      | 9                       | 9                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/22      | 1,035                | 322                     | 3                        | 3                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/23-7/24 | 27,660               | 6,233                   | 124                      | 124                     | 100                     | 100                     | 2                | 106                 | 5,528    |                           |                       |   |
| Central            | Drift           | Combined         | 7/26      | 16,659               | 4,691                   | 107                      | 107                     | 85                      | 85                      | 1                | 43                  | 1,806    |                           |                       |   |
| Central            | Drift           | Combined         | 7/27      | 1,238                | 401                     | 15                       | 15                      | 11                      | 11                      | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 7/28      | 2,956                | 993                     | 29                       | 29                      | 26                      | 26                      | 1                | 36                  | 1,260    |                           |                       |   |
| Central            | Drift           | Combined         | 7/29      | 3,200                | 1,099                   | 42                       | 42                      | 32                      | 32                      | 2                | 70                  | 2,387    |                           |                       |   |
| Central            | Drift           | Combined         | 7/30-7/31 | 25,638               | 7,938                   | 234                      | 234                     | 195                     | 195                     | 11               | 425                 | 16,458   | 1                         |                       |   |
| Central            | Drift           | Combined         | 8/01-8/02 | 11,312               | 3,252                   | 90                       | 90                      | 70                      | 70                      | 6                | 250                 | 10,314   | 1                         |                       |   |
| Central            | Drift           | Combined         | 8/03      | 135                  | 59                      | 0                        | 0                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 8/04      | 94                   | 13                      | 1                        | 1                       | 1                       | 1                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 8/06-8/07 | 1,683                | 206                     | 2                        | 2                       | 2                       | 2                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | Drift           | Combined         | 8/09-9/03 | 5,756                | 655                     | 15                       | 15                      | 12                      | 12                      | 0                | 0                   | 0        |                           |                       |   |
| <b>Drift Total</b> |                 |                  |           | 121,785              | 33,612                  | 769                      | 768                     | 603                     | 603                     | 23               | 930                 | 37,753   | 2                         | 0                     | 0 |
| Central            | East Side Set   | 24421            | 6/28-7/23 | 321                  | 25                      | 0                        | 0                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | East Side Set   | 24421            | 7/26      | 190                  | 18                      | 0                        | 0                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | East Side Set   | 24421            | 7/30-7/31 | 787                  | 30                      | 1                        | 1                       | 1                       | 1                       | 1                | 314                 | 98,283   |                           |                       |   |
| Central            | East Side Set   | 24421            | 8/02      | 322                  | 105                     | 5                        | 5                       | 4                       | 4                       | 1                | 37                  | 1,332    |                           |                       |   |
| Central            | East Side Set   | 24421            | 8/06      | 776                  | 249                     | 16                       | 16                      | 13                      | 13                      | 10               | 373                 | 13,893   |                           |                       |   |
| Central            | East Side Set   | 24421            | 8/09      | 529                  | 38                      | 38                       | 0                       | 0                       | 0                       | 0                | 0                   | 0        |                           |                       |   |
| Central            | East Side Set   | 24421            | 8/13      | 828                  | 338                     | 23                       | 23                      | 23                      | 23                      | 16               | 469                 | 13,859   |                           | 1                     | 1 |
| <b>24421 Total</b> |                 |                  |           | 3,753                | 803                     | 83                       | 45                      | 41                      | 41                      | 28               | 1,193               | 127,367  | 0                         | 1                     | 1 |

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Appendix A5.-Page 2 of 5.

| Fishery District   | Gillnet Fishery | Statistical Area | Date      | (N) Total Harvest | (n2) Number Examined | (a1) Adclips Observed | (a2) Heads Recovered | (m1) Heads with Tags | (m2) Decodeable Tags | (mc) Source = |                  |          | Other Kenai River Sources |                    |   |
|--------------------|-----------------|------------------|-----------|-------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|---------------|------------------|----------|---------------------------|--------------------|---|
|                    |                 |                  |           |                   |                      |                       |                      |                      |                      | Moose R 1992  | Harvest Estimate | Variance | Hidden C 1992             | Skilak L 1991 1992 |   |
| Central            | East Side Set   | 24422            | 6/28-7/23 | 587               | 46                   | 1                     | 1                    | 1                    | 1                    | 1             | 153              | 23,256   |                           |                    |   |
| Central            | East Side Set   | 24422            | 7/26      | 509               | 90                   | 1                     | 1                    | 1                    | 1                    | 0             | 0                | 0        |                           | 1                  |   |
| Central            | East Side Set   | 24422            | 7/30-7/31 | 1,038             | 114                  | 6                     | 6                    | 5                    | 5                    | 2             | 218              | 23,611   |                           | 1                  |   |
| Central            | East Side Set   | 24422            | 8/02      | 474               | 146                  | 9                     | 9                    | 8                    | 8                    | 6             | 233              | 8,943    |                           |                    |   |
| Central            | East Side Set   | 24422            | 8/06      | 1,203             | 199                  | 10                    | 10                   | 10                   | 10                   | 6             | 434              | 31,401   |                           | 1                  |   |
| Central            | East Side Set   | 24422            | 8/09      | 562               | 149                  | 9                     | 9                    | 9                    | 9                    | 8             | 361              | 16,251   |                           |                    |   |
| Central            | East Side Set   | 24422            | 8/13      | 759               | 121                  | 11                    | 11                   | 8                    | 8                    | 4             | 300              | 22,391   | 1                         | 1                  |   |
| <b>24422 Total</b> |                 |                  |           | 5,132             | 865                  | 47                    | 47                   | 42                   | 42                   | 27            | 1,699            | 125,853  | 1                         | 4                  | 0 |
| Central            | East Side Set   | 24430            | 6/28-7/24 | 2,054             | 18                   | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24430            | 7/26      | 550               | 128                  | 2                     | 2                    | 2                    | 2                    | 2             | 103              | 5,217    |                           |                    |   |
| Central            | East Side Set   | 24430            | 7/27      | 365               | 91                   | 3                     | 3                    | 2                    | 2                    | 1             | 48               | 2,256    |                           |                    |   |
| Central            | East Side Set   | 24430            | 7/28      | 919               | 242                  | 7                     | 7                    | 6                    | 6                    | 1             | 45               | 1,981    |                           |                    |   |
| Central            | East Side Set   | 24430            | 7/29      | 1,743             | 504                  | 11                    | 11                   | 7                    | 7                    | 0             | 0                | 0        | 2                         | 1                  |   |
| Central            | East Side Set   | 24430            | 7/30-7/31 | 1,739             | 92                   | 4                     | 4                    | 4                    | 4                    | 2             | 453              | 102,441  |                           | 1                  |   |
| Central            | East Side Set   | 24430            | 8/01-8/02 | 1,587             | 276                  | 9                     | 9                    | 8                    | 8                    | 6             | 413              | 28,416   |                           | 1                  |   |
| Central            | East Side Set   | 24430            | 8/03      | 610               | 231                  | 6                     | 6                    | 6                    | 6                    | 3             | 95               | 2,930    |                           |                    |   |
| Central            | East Side Set   | 24430            | 8/04      | 1,178             | 424                  | 27                    | 27                   | 25                   | 25                   | 15            | 499              | 16,755   | 1                         | 2                  |   |
| Central            | East Side Set   | 24430            | 8/06      | 440               | 66                   | 3                     | 3                    | 2                    | 2                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24430            | 8/07      | 816               | 70                   | 2                     | 2                    | 2                    | 2                    | 2             | 279              | 38,752   |                           |                    |   |
| Central            | East Side Set   | 24430            | 8/09-8/13 | 1,319             | 168                  | 8                     | 8                    | 8                    | 8                    | 6             | 564              | 53,198   |                           | 1                  |   |
| <b>24430 Total</b> |                 |                  |           | 13,320            | 2,310                | 82                    | 82                   | 72                   | 72                   | 38            | 2,499            | 251,946  | 3                         | 6                  | 0 |
| Central            | East Side Set   | 24440            | 7/02-7/24 | 3,013             | 66                   | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24440            | 7/26      | 1,174             | 251                  | 2                     | 2                    | 1                    | 1                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24440            | 7/27      | 983               | 112                  | 2                     | 2                    | 2                    | 2                    | 0             | 0                | 0        |                           | 1                  |   |
| Central            | East Side Set   | 24440            | 7/28      | 2,236             | 973                  | 24                    | 24                   | 19                   | 19                   | 3             | 83               | 2,226    |                           |                    |   |
| Central            | East Side Set   | 24440            | 7/29      | 2,039             | 184                  | 4                     | 4                    | 3                    | 3                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24440            | 7/30-7/31 | 4,484             | 685                  | 23                    | 23                   | 19                   | 19                   | 3             | 235              | 18,278   |                           |                    |   |
| Central            | East Side Set   | 24440            | 8/01      | 1,056             | 300                  | 12                    | 12                   | 8                    | 8                    | 2             | 84               | 3,454    |                           |                    |   |
| Central            | East Side Set   | 24440            | 8/02      | 1,054             | 222                  | 7                     | 7                    | 7                    | 7                    | 0             | 0                | 0        |                           |                    |   |
| Central            | East Side Set   | 24440            | 8/03      | 782               | 371                  | 19                    | 19                   | 14                   | 14                   | 1             | 25               | 600      |                           | 1                  |   |
| Central            | East Side Set   | 24440            | 8/04      | 1,021             | 452                  | 21                    | 21                   | 17                   | 17                   | 7             | 189              | 5,001    |                           | 1                  |   |
| Central            | East Side Set   | 24440            | 8/06      | 790               | 539                  | 23                    | 23                   | 20                   | 20                   | 7             | 123              | 2,075    |                           | 5                  |   |
| Central            | East Side Set   | 24440            | 8/07      | 704               | 357                  | 19                    | 19                   | 17                   | 17                   | 9             | 213              | 4,941    |                           |                    |   |
| Central            | East Side Set   | 24440            | 8/09      | 696               | 265                  | 15                    | 15                   | 13                   | 13                   | 7             | 220              | 6,812    | 1                         | 1                  |   |
| Central            | East Side Set   | 24440            | 8/13      | 838               | 165                  | 6                     | 6                    | 4                    | 4                    | 4             | 243              | 14,645   |                           |                    |   |
| <b>24440 Total</b> |                 |                  |           | 20,870            | 4,942                | 177                   | 177                  | 144                  | 144                  | 43            | 1,415            | 58,032   | 1                         | 9                  | 0 |

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Appendix A5.-Page 3 of 5.

| Fishery District                            | Gillnet Fishery | Statistical Area | Date      | (N) Total Harvest | (n2) Number Examined | (a1) Adclips Observed | (a2) Heads Recovered | (m1) Heads with Tags | (m2) Decodeable Tags | (mc) Source = |                  |          | Other Kenai River Sources |                    |    |   |
|---|-----------------|------------------|-----------|-------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|---------------|------------------|----------|---------------------------|--------------------|----|---|
|   |                 |                  |           |                   |                      |                       |                      |                      |                      | Moose R 1992  | Harvest Estimate | Variance | Hidden C 1992             | Skilak L 1991 1992 |    |   |
| Central                                     | East Side Set   | Unknown          | 7/23      |                   | 1                    | 0                     | 0                    | 0                    | 0                    | 0             |                  |          |                           |                    |    |   |
| Central                                     | East Side Set   | Unknown          | 7/26      |                   | 117                  | 4                     | 4                    | 4                    | 4                    | 0             |                  |          |                           |                    |    |   |
| Central                                     | East Side Set   | Unknown          | 8/02      |                   | 38                   | 3                     | 3                    | 1                    | 1                    | 1             |                  |          |                           |                    |    |   |
| Central                                     | East Side Set   | Unknown          | 8/03      |                   | 208                  | 11                    | 11                   | 7                    | 7                    | 4             |                  |          |                           |                    |    | 1 |
| Central                                     | East Side Set   | Unknown          | 8/06      |                   | 160                  | 14                    | 14                   | 13                   | 13                   | 4             |                  |          |                           |                    |    | 4 |
| Central                                     | East Side Set   | Unknown          | 8/13      |                   | 25                   | 1                     | 1                    | 1                    | 1                    | 1             |                  |          |                           |                    |    |   |
| <b>Unknown Total</b>                        |                 |                  |           |                   | 0                    | 549                   | 33                   | 33                   | 26                   | 26            | 10               | 0        | 0                         | 0                  | 5  | 0 |
| <b>East Side Set Total</b>                  |                 |                  |           |                   | 43,075               | 9,469                 | 422                  | 384                  | 325                  | 325           | 146              | 6,806    | 563,198                   | 5                  | 25 | 1 |
| <b>Chinitna Set/Drift Total<sup>a</sup></b> |                 |                  |           |                   | 2,104                | 148                   | 1                    | 1                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>Kalgin I. Set Total<sup>a</sup></b>      |                 |                  |           |                   | 16,826               | 1,958                 | 35                   | 35                   | 26                   | 26            | 2                | 30       | 540                       | 0                  | 0  | 0 |
| <b>24520 Total</b>                          |                 |                  |           |                   | 3,314                | 909                   | 4                    | 4                    | 2                    | 2             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>24530 Total</b>                          |                 |                  |           |                   | 2,597                | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>24540 Total</b>                          |                 |                  |           |                   | 3,208                | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>24550 Total</b>                          |                 |                  |           |                   | 76                   | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>24555 Total</b>                          |                 |                  |           |                   | 3,315                | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>24560 Total</b>                          |                 |                  |           |                   | 4,264                | 0                     | 0                    | 0                    | 0                    | 0             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>Unknown Total</b>                        |                 |                  |           |                   | 0                    | 959                   | 1                    | 1                    | 1                    | 1             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>West Side Set Total<sup>a</sup></b>      |                 |                  |           |                   | 16,774               | 1,868                 | 5                    | 5                    | 3                    | 3             | 0                | 0        | 0                         | 0                  | 0  | 0 |
| <b>Central Total</b>                        |                 |                  |           |                   | 200,564              | 47,055                | 1,232                | 1,193                | 957                  | 957           | 171              | 7,766    | 601,491                   | 7                  | 25 | 1 |
| Northern                                    | East Side Set   | 247-708090       | 6/14-7/16 | 222               | 130                  | 1                     | 1                    | 1                    | 1                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 7/19      | 282               | 66                   | 0                     | 0                    | 0                    | 0                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 7/26      | 1,225             | 285                  | 7                     | 7                    | 3                    | 3                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 7/30      | 927               | 207                  | 11                    | 11                   | 9                    | 9                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/02      | 783               | 560                  | 39                    | 39                   | 33                   | 33                   | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/06      | 920               | 72                   | 5                     | 5                    | 4                    | 4                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/09      | 1,171             | 698                  | 22                    | 22                   | 15                   | 15                   | 1             | 20               | 380      | 1                         |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/13      | 1,743             | 458                  | 17                    | 17                   | 15                   | 15                   | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/16      | 2,464             | 2,132                | 49                    | 49                   | 33                   | 33                   | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/20      | 314               | 140                  | 7                     | 7                    | 4                    | 4                    | 0             |                  |          |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/23      | 2,705             | 1,782                | 21                    | 21                   | 19                   | 19                   | 5             | 91               | 1,584    |                           |                    |    |   |
| Northern                                    | East Side Set   | 247-708090       | 8/27      | 2,184             | 2,229                | 15                    | 15                   | 13                   | 13                   | 0             |                  |          |                           |                    |    |   |

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Appendix A5.-Page 4 of 5.

| Fishery District               | Gillnet Fishery   | Statistical Area | Date      | (N) Total Harvest | (n2) Number Examined | (a1) Adclips Observed | (a2) Heads Recovered | (m1) Heads with Tags | (m2) Decodeable Tags | (mc) Source = |                  |          | Other Kenai River Sources |                    |   |
|--------------------------------|-------------------|------------------|-----------|-------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|---------------|------------------|----------|---------------------------|--------------------|---|
|                                |                   |                  |           |                   |                      |                       |                      |                      |                      | Moose R 1992  | Harvest Estimate | Variance | Hidden C 1992             | Skilak L 1991 1992 |   |
| Northern                       | East Side Set     | 247-708090       | 8/30      | 1,349             | 1,234                | 22                    | 22                   | 17                   | 17                   | 0             |                  |          |                           |                    |   |
| Northern                       | East Side Set     | 247-708090       | 9/03      | 1,834             | 1,576                | 12                    | 12                   | 10                   | 10                   | 0             |                  |          |                           |                    |   |
| Northern                       | East Side Set     | 247-708090       | 9/06      | 244               | 227                  | 4                     | 4                    | 2                    | 2                    | 0             |                  |          |                           |                    |   |
| Northern                       | East Side Set     | 247-708090       | 9/10      | 583               | 563                  | 48                    | 48                   | 39                   | 39                   | 1             | 12               | 132      |                           |                    |   |
| Northern                       | East Side Set     | 247-708090       | 9/13      | 117               | 106                  | 12                    | 12                   | 11                   | 11                   | 0             |                  |          |                           |                    |   |
| <b>East Side Set Total</b>     |                   |                  |           | 19,067            | 12,465               | 292                   | 292                  | 228                  | 228                  | 7             | 123              | 2,096    | 1                         | 0                  | 0 |
| Northern                       | Fire I. Set       | 24743            | 7/02-7/16 | 739               | 4                    | 0                     | 0                    | 0                    | 0                    | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 7/19      | 292               | 170                  | 4                     | 4                    | 3                    | 3                    | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 7/26      | 1,199             | 941                  | 49                    | 49                   | 44                   | 44                   | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 7/30      | 943               | 264                  | 16                    | 16                   | 14                   | 14                   | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/02      | 1,680             | 1,552                | 84                    | 84                   | 73                   | 73                   | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/06      | 1,887             | 1,516                | 72                    | 72                   | 58                   | 58                   | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/09      | 933               | 586                  | 39                    | 39                   | 33                   | 33                   | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/13      | 1,276             | 1,372                | 145                   | 145                  | 111                  | 111                  | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/16      | 330               | 177                  | 11                    | 11                   | 6                    | 6                    | 0             |                  |          |                           |                    |   |
| Northern                       | Fire I. Set       | 24743            | 8/20-9/13 | 900               | 143                  | 9                     | 9                    | 6                    | 6                    | 0             |                  |          |                           |                    |   |
| <b>Fire I. Set Total</b>       |                   |                  |           | 10,179            | 6,725                | 429                   | 429                  | 348                  | 348                  | 0             | 0                | 0        | 0                         | 0                  | 0 |
| Northern                       | Pt. MacKenzie Set | 24742            | 7/12-7/16 | 147               | 143                  | 4                     | 4                    | 2                    | 2                    | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 7/19      | 29                | 29                   | 0                     | 0                    | 0                    | 0                    | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 7/26-7/30 | 1,633             | 615                  | 27                    | 27                   | 24                   | 24                   | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 8/02      | 1,475             | 1,173                | 58                    | 58                   | 45                   | 45                   | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 8/06      | 905               | 415                  | 30                    | 29                   | 22                   | 22                   | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 8/09      | 933               | 512                  | 28                    | 28                   | 23                   | 23                   | 0             |                  |          |                           |                    |   |
| Northern                       | Pt. MacKenzie Set | 24742            | 8/13-8/16 | 795               | 448                  | 20                    | 20                   | 16                   | 15                   | 0             |                  |          |                           |                    |   |
| <b>Pt. MacKenzie Set Total</b> |                   |                  |           | 5,917             | 3,335                | 167                   | 166                  | 132                  | 131                  | 0             | 0                | 0        | 0                         | 0                  | 0 |
| Northern                       | Susitna Flats Set | 24741            | 7/16      | 152               | 66                   | 1                     | 1                    | 1                    | 1                    | 0             |                  |          |                           |                    |   |
| Northern                       | Susitna Flats Set | 24741            | 7/19      | 205               | 106                  | 2                     | 2                    | 2                    | 2                    | 0             |                  |          |                           |                    |   |
| Northern                       | Susitna Flats Set | 24741            | 7/26      | 961               | 229                  | 9                     | 9                    | 7                    | 7                    | 0             |                  |          |                           |                    |   |

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Appendix A5.-Page 5 of 5.

| Fishery District                                 | Gillnet Fishery   | Statistical Area | Date      | (N) Total Harvest | (n2) Number Examined | (a1) Adclips Observed | (a2) Heads Recovered | (m1) Heads with Tags | (m2) Decodeable Tags | (mc) Source = Moose R 1992 | Harvest Estimate | Variance       | Other Kenai River Sources |               |               |          |
|--|-------------------|------------------|-----------|-------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------------|------------------|----------------|---------------------------|---------------|---------------|----------|
|  |                   |                  |           |                   |                      |                       |                      |                      |                      |                            |                  |                | Hidden C 1992             | Skilak L 1991 | Skilak L 1992 |          |
| Northern   | Susitna Flats Set | 24741            | 7/30      | 2,310             | 955                  | 25                    | 25                   | 22                   | 22                   | 0                          |                  |                |                           |               |               |          |
| Northern   | Susitna Flats Set | 24741            | 8/02      | 1,886             | 895                  | 33                    | 33                   | 26                   | 26                   | 1                          | 25               | 600            |                           |               |               |          |
| Northern   | Susitna Flats Set | 24741            | 8/06      | 1,163             | 286                  | 13                    | 13                   | 8                    | 8                    | 0                          |                  |                |                           |               |               |          |
| Northern   | Susitna Flats Set | 24741            | 8/09      | 855               | 185                  | 11                    | 11                   | 9                    | 9                    | 0                          |                  |                |                           |               |               |          |
| Northern   | Susitna Flats Set | 24741            | 8/13      | 353               | 261                  | 15                    | 15                   | 13                   | 13                   | 0                          |                  |                |                           |               |               |          |
| Northern   | Susitna Flats Set | 24741            | 8/16      | 120               | 96                   | 5                     | 5                    | 3                    | 3                    | 0                          |                  |                |                           |               |               |          |
| <b>Susitna Flats Set Total</b>                   |                   |                  |           | <b>8,005</b>      | <b>3,079</b>         | <b>114</b>            | <b>114</b>           | <b>91</b>            | <b>91</b>            | <b>1</b>                   | <b>25</b>        | <b>600</b>     | <b>0</b>                  | <b>0</b>      | <b>0</b>      | <b>0</b> |
| Northern   | West Side Set     | 247-1020         | 7/05-7/19 | 4,460             | 902                  | 3                     | 3                    | 1                    | 1                    | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 7/26      | 3,902             | 1,141                | 7                     | 7                    | 6                    | 6                    | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 7/30      | 3,539             | 1,778                | 14                    | 14                   | 10                   | 10                   | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 8/02      | 3,026             | 935                  | 11                    | 11                   | 9                    | 9                    | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 8/06      | 2,585             | 526                  | 13                    | 13                   | 12                   | 12                   | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 8/09      | 1,621             | 998                  | 18                    | 18                   | 10                   | 10                   | 0                          |                  |                |                           |               |               |          |
| Northern   | West Side Set     | 247-1020         | 8/13-8/30 | 3,565             | 659                  | 9                     | 9                    | 8                    | 8                    | 0                          |                  |                |                           |               |               |          |
| <b>West Side Set Total</b>                       |                   |                  |           | <b>22,698</b>     | <b>6,939</b>         | <b>75</b>             | <b>75</b>            | <b>56</b>            | <b>56</b>            | <b>0</b>                   | <b>0</b>         | <b>0</b>       | <b>0</b>                  | <b>0</b>      | <b>0</b>      | <b>0</b> |
| <b>Northern Total</b>                            |                   |                  |           | <b>65,866</b>     | <b>32,543</b>        | <b>1,077</b>          | <b>1,076</b>         | <b>855</b>           | <b>854</b>           | <b>8</b>                   | <b>148</b>       | <b>2,696</b>   | <b>1</b>                  | <b>0</b>      | <b>0</b>      | <b>0</b> |
| <b>Central and Northern District Grand Total</b> |                   |                  |           | <b>266,430</b>    | <b>79,598</b>        | <b>2,309</b>          | <b>2,269</b>         | <b>1,812</b>         | <b>1,811</b>         | <b>179</b>                 | <b>7,914</b>     | <b>604,187</b> | <b>8</b>                  | <b>25</b>     | <b>1</b>      | <b>1</b> |

<sup>a</sup> Not a target fishery. Daily information is not included because this fishery was not sampled, or was sampled incidentally.