

Fishery Management Report No. 95-7

**Area Management Report for the Recreational
Fisheries of the Central Gulf Management Area,
1994**

by

Andrew Hoffmann

September 1995

Alaska Department of Fish and Game

Division of Sport Fish



Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the *Système International d'Unités* (SI), are used in Division of Sport Fish Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications without definition. All others must be defined in the text at first mention, as well as in the titles or footnotes of tables and in figures or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

| | |
|-------------------------|--------------------|
| cubic feet per second | ft ³ /s |
| foot | ft |
| gallon | gal |
| inch | in |
| mile | mi |
| ounce | oz |
| pound | lb |
| quart | qt |
| yard | yd |
| Spell out acre and ton. | |

Time and temperature

| | |
|------------------------------------|-----|
| day | d |
| degrees Celsius | °C |
| degrees Fahrenheit | °F |
| hour (spell out for 24-hour clock) | h |
| minute | min |
| second | s |
| Spell out year, month, and week. | |

Physics and chemistry

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

General

| | |
|---|---|
| All commonly accepted abbreviations. | e.g., Mr., Mrs., a.m., p.m., etc. |
| All commonly accepted professional titles. | e.g., Dr., Ph.D., R.N., etc. |
| and | & |
| at | @ |
| Compass directions: | |
| east | E |
| north | N |
| south | S |
| west | W |
| Copyright | © |
| Corporate suffixes: | |
| Company | Co. |
| Corporation | Corp. |
| Incorporated | Inc. |
| Limited | Ltd. |
| et al (and other people) | et al. |
| et cetera (and so forth) | etc. |
| exempli gratia (for example) | e.g., |
| id est (that is) | i.e., |
| latitude or longitude | lat. or long. |
| monetary symbols (U.S.) | \$, ¢ |
| months (tables and figures): first three letters | Jan,...,Dec |
| number (before a number) | # (e.g., #10) |
| pounds (after a number) | # (e.g., 10#) |
| registered trademark | ® |
| trademark | ™ |
| United States (adjective) | U.S. |
| United States of America (noun) | USA |
| U.S. state and District of Columbia abbreviations | use two-letter abbreviations (e.g., AK, DC) |

Mathematics, statistics, fisheries

| | |
|---|-----------------------------|
| alternate hypothesis | H _A |
| base of natural logarithm | e |
| catch per unit effort | CPUE |
| coefficient of variation | CV |
| common test statistics | F, t, χ ² , etc. |
| confidence interval | C.I. |
| correlation coefficient | R (multiple) |
| correlation coefficient | r (simple) |
| covariance | cov |
| degree (angular or temperature) | ° |
| degrees of freedom | df |
| divided by | ÷ or / (in equations) |
| equals | = |
| expected value | E |
| fork length | FL |
| greater than | > |
| greater than or equal to | ≥ |
| harvest per unit effort | HPUE |
| less than | < |
| less than or equal to | ≤ |
| logarithm (natural) | ln |
| logarithm (base 10) | log |
| logarithm (specify base) | log ₂ , etc. |
| mid-eye-to-fork | MEF |
| minute (angular) | ' |
| multiplied by | x |
| not significant | NS |
| null hypothesis | H ₀ |
| percent | % |
| probability | P |
| probability of a type I error (rejection of the null hypothesis when true) | α |
| probability of a type II error (acceptance of the null hypothesis when false) | β |
| second (angular) | " |
| standard deviation | SD |
| standard error | SE |
| standard length | SL |
| total length | TL |
| variance | Var |

FISHERY MANAGEMENT REPORT NO. 95-7

**AREA MANAGEMENT REPORT FOR THE RECREATIONAL
FISHERIES OF THE CENTRAL GULF MANAGEMENT AREA, 1994**

by

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The Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Distribution is to state and local publication distribution centers, libraries and individuals and, on request, to other libraries, agencies, and individuals. This publication has undergone regional peer review.

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PREFACE

This report is divided into two sections. *Section I* presents an introductory overview of the Central Gulf Management Area. Included in this section are a general geographic and organizational description of the management area; an overview of the Alaska Board of Fisheries process and schedules for the management area; an inventory of available fishery resources; a historical perspective of recreational angler effort and harvest within management area waters; an approximation of the economic value of recreational fisheries; and a general description of stocking, research, management, partnership, aquatic education, viewing, and access activities being conducted in the management area. Also included are a summary of the major fishery and social issues that presently occur in the Central Gulf Management Area as well as recommendations for solving them including, but not limited to, research, management, access, regulatory changes, aquatic education, partnership, stocking, or habitat options.

Section II provides a more detailed summary of all major fisheries that occur in the Central Gulf Management Area. Included in this section are a description and historical perspective of each fishery, the management objective(s) for each fishery, a description of recent fishery performance, a description of recent Board of Fisheries actions, a description of any social or biological issues surrounding each fishery, and a description of ongoing or recommended research or management activities for each fishery.

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SECTION I: MANAGEMENT AREA OVERVIEW

MANAGEMENT AREA DESCRIPTION

The Central Gulf Management Area (CGMA) includes all waters of the Gulf of Alaska and its drainages west of the longitude of Cape Suckling (143° 53' W longitude), and east of the longitude of Gore Point (150° 57' 30" N longitude), excluding the Copper River drainage upstream of a line crossing the Copper River between the south bank of the confluence of Haley Creek and the south bank of the confluence of Canyon Creek in Wood's Canyon (Figure 1). This management area is comprised of the Prince William Sound (PWS) Regulatory Area and portions of the Kenai Peninsula (fresh water) and the Cook Inlet-Resurrection Bay Saltwater regulatory areas¹.

The Central Gulf Management Area includes the communities of Valdez, Cordova, Whittier, Seward and the native villages of Chenega and Tatitlek. Only Valdez and Seward are accessible by the Alaska Highway system. The Alaska Marine Highway ferries travelers to Whittier, Cordova, Seward, and Tatitlek while Chenega is reachable only by plane or boat. Whittier and Seward are additionally serviced by the Alaska Railroad. With the exception of some road accessible streams, virtually all sport fisheries in the CGMA are remote and relatively difficult to travel to. Principal land managers in the CGMA include the National Park Service, U.S. Forest Service, various native corporations, and the State of Alaska.

Management and research functions for the CGMA are handled from the Anchorage regional office. These activities are directed by a Fisheries Biologist III area management biologist, Andrew Hoffmann, and assistant area biologists Nicole Szarzi and Barry Stratton.

Groundfish research and management is directed by a Fisheries Biologist III, Douglas Vincent-Lang, stationed in Anchorage, and research biologist, Scott Meyer, to be stationed in Homer. Groundfish issues are managed on a larger scale covering the Gulf of Alaska west of Cape Suckling to the Aleutian Islands. Therefore, groundfish issues will be covered in less detail in this report and the reader is referred to the Area Management Report for the Recreational Fisheries for Groundfish of the North Gulf of Alaska (Vincent-Lang 1995).

ALASKA BOARD OF FISHERIES ACTIVITIES

The Alaska Board of Fisheries (BOF) is responsible for promulgating regulations in state waters. Public input concerning regulation changes and allocation issues is provided through various means including direct testimony to the Board of Fisheries and participation in local fish and game advisory committees. These advisory committees have been established throughout Alaska to assist the Boards of Fisheries and Game in assessing proposed fisheries and wildlife issues and regulation changes. Most committees meet at least once each year, usually in the fall prior to the Board meetings. Staff from the Division of Sport Fish and other divisions of the Alaska Department of Fish and Game (ADF&G) often attend committee meetings. Advisory committee meetings allow for direct public interaction with department staff involved with local resource issues. Within the CGMA there are four Fish and Game Advisory Committees: Valdez, Whittier, Cordova (Copper River/Prince William Sound), and Seward.

¹ The Central Gulf Management Area overlaps three regulatory areas. The Prince William Sound Regulatory Area in its entirety represents Area J of the Statewide Harvest Survey. Portions of the Cook Inlet-Resurrection Bay Saltwater and Kenai Peninsula (fresh water) regulatory areas represent a portion of Area P of the Statewide Harvest survey (Mills 1994).

CENTRAL GULF MANAGEMENT AREA

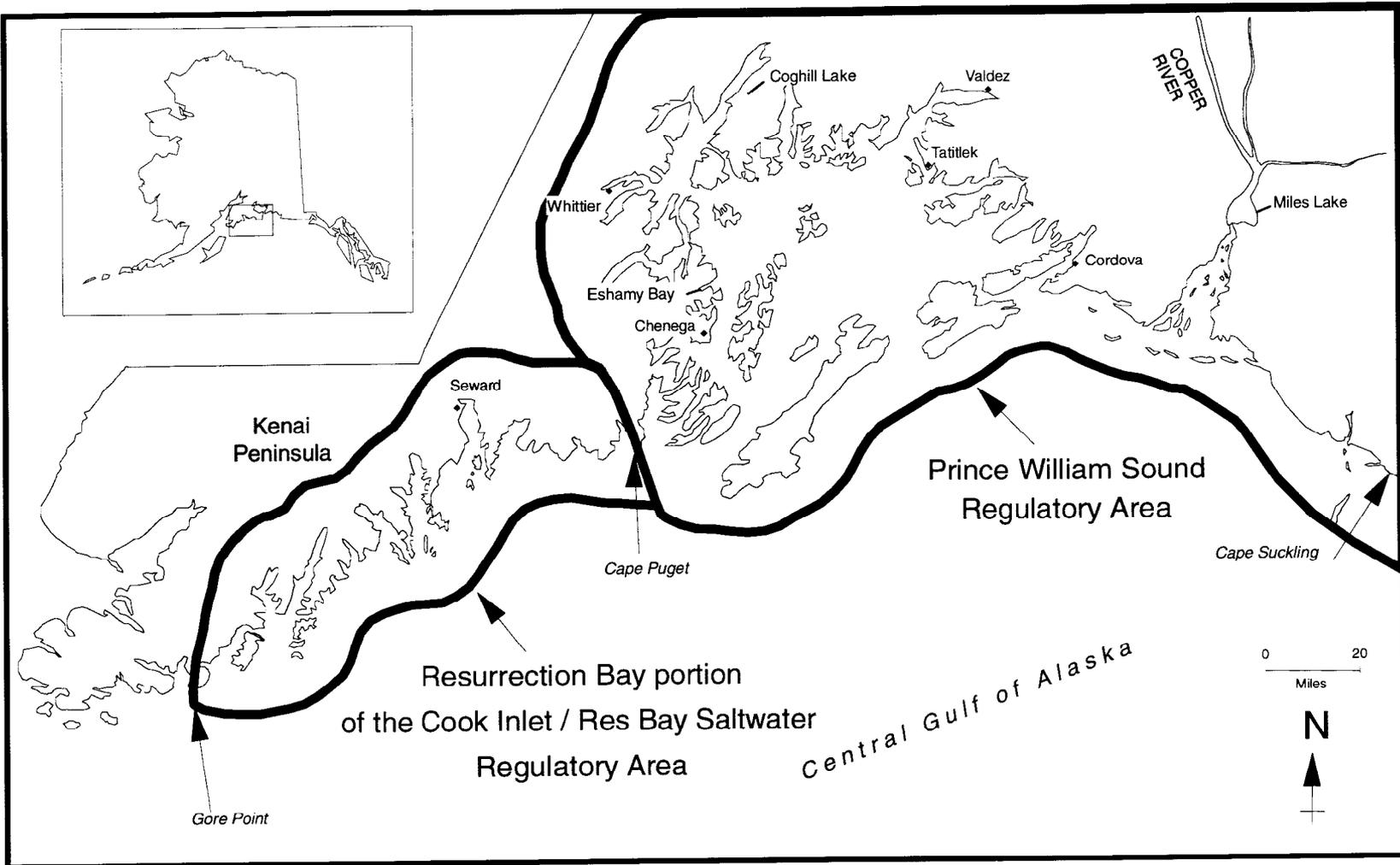


Figure 1.-Map of Central Gulf Management Area and regulatory area components.

Under its current schedule, the Board of Fisheries reviews regulations for each area on a 3-year cycle. Proposals regarding the Resurrection Bay-Cook Inlet Regulatory Area were last considered during the November 1992 Board meetings, thus the next scheduled regular meeting for this area is November of 1995. Proposals for the PWS Regulatory Area were heard during the February and March 1994 Board meetings, thus the next meeting will be in February of 1997. Proposals must be submitted between the time the board issues a call for proposals, usually in December or January, and the deadline set by that call for proposals, usually in early April.

FISHERIES RESOURCE INVENTORY

Sport anglers fishing CGMA waters target five species of North Pacific salmon (pink *Oncorhynchus gorbuscha*, coho *O. kisutch*, sockeye *O. nerka*, chum *O. keta*, and chinook *O. tshawytscha*). There are major saltwater sport fisheries for halibut *Hippoglossus stenolepis*, rockfish *Sebastes*, and lingcod *Ophiodon elongatus*. There are also fisheries for Dolly Varden *Salvelinus malma* and cutthroat trout *O. clarki*. The stocking program provides fisheries for rainbow trout *O. mykiss* and Arctic grayling *Thymallus arcticus* in several lakes. Dungeness crab *Cancer magister*, Tanner crab *Chionoecetes bairdi*, king crab *Paralithodes camtschatica*, shrimp *Pandalidae*, and razor clams *Siliqua patula* are harvested in limited numbers.

The Division of Sport Fish classifies sport fisheries into three categories based on a combination of yield (harvest) and angler-cost criteria.

Level I fisheries are defined as high yield, low angler-cost fisheries. These fisheries are typically entry level fisheries that anglers can participate in at little direct cost.

Level II fisheries fall between Level I and Level III fisheries and are defined as basic yield, intermediate-cost fisheries.

Level III fisheries are defined as low yield, high cost fisheries. These fisheries are typically remote and have a high cost associated with participation.

The CGMA offers primarily Level I and Level III fishing opportunities for recreational anglers. Road-accessible salmon, Dolly Varden, cutthroat trout fisheries and stocked lakes provide Level I fisheries for the residents of the major communities. The remaining waters of the CGMA which are accessible by boat or plane offer Level III fisheries. Examples of Level III fisheries include a sockeye salmon fishery on Eshamy Bay located in PWS and halibut fishing around the Chiswell Islands located near Seward.

RECREATIONAL ANGLER EFFORT²

From 1983 through 1992, an average of 141,300 angler-days have been expended by recreational anglers fishing CGMA waters (Table 1). Recreational angler effort was relatively stable from 1977 through 1983 and has been increasing annually since 1983. The estimated sport effort of 194,851 angler-days for the CGMA during 1993 was 38% above the historical average effort for the area and represented 8% and 10% of the total statewide and Southcentral region sport angling effort, respectively (Table 1 and Figure 2).

² Most CGMA fisheries are not monitored by onsite creel surveys. For this reason, the Statewide Harvest Survey by Mills (1979-1994), serves as the basic reference for effort and harvest for most fisheries in the area. It is not possible, because of the nature of the harvest survey, to determine the amount of effort expended on a species-specific basis.

Table 1.-Number of angler-days of effort expended sport fishing in the Central Gulf Management Area (CGMA) from 1983-1993.

| Year | Statewide Effort | Southcentral Effort | Central Gulf Effort | Total PWS Effort | Total Res Bay Effort | Percent of Statewide From CGMA | Percent of Southcentral From CGMA |
|----------------------------|------------------|---------------------|---------------------|------------------|----------------------|--------------------------------|-----------------------------------|
| 1983 | 1,732,528 | 1,212,916 | 89,764 | 47,614 | 42,150 | 5% | 7% |
| 1984 | 1,866,837 | 1,341,658 | 104,226 | 57,548 | 46,678 | 6% | 8% |
| 1985 | 1,943,069 | 1,406,419 | 128,421 | 72,662 | 55,759 | 7% | 9% |
| 1986 | 2,071,412 | 1,518,712 | 119,623 | 64,251 | 55,372 | 6% | 8% |
| 1987 | 2,152,886 | 1,556,050 | 125,520 | 81,221 | 44,299 | 6% | 8% |
| 1988 | 2,311,291 | 1,679,939 | 138,000 | 84,971 | 53,029 | 6% | 8% |
| 1989 | 2,264,079 | 1,583,547 | 145,793 | 95,247 | 50,546 | 6% | 9% |
| 1990 | 2,453,284 | 1,745,110 | 177,920 | 105,739 | 72,181 | 7% | 10% |
| 1991 | 2,456,328 | 1,782,055 | 186,745 | 113,062 | 73,683 | 8% | 10% |
| 1992 | 2,540,374 | 1,889,730 | 196,986 | 113,418 | 83,568 | 8% | 10% |
| 1993 | 2,559,408 | 1,867,233 | 194,851 | 104,577 | 90,274 | 8% | 10% |
| 1983-1992 | | | | | | | |
| MEAN | 2,179,209 | 1,571,614 | 141,300 | 83,573 | 57,727 | 6% | 9% |
| % CHANGE of 1993 FROM MEAN | 17% | 19% | 38% | 25% | 56% | | |

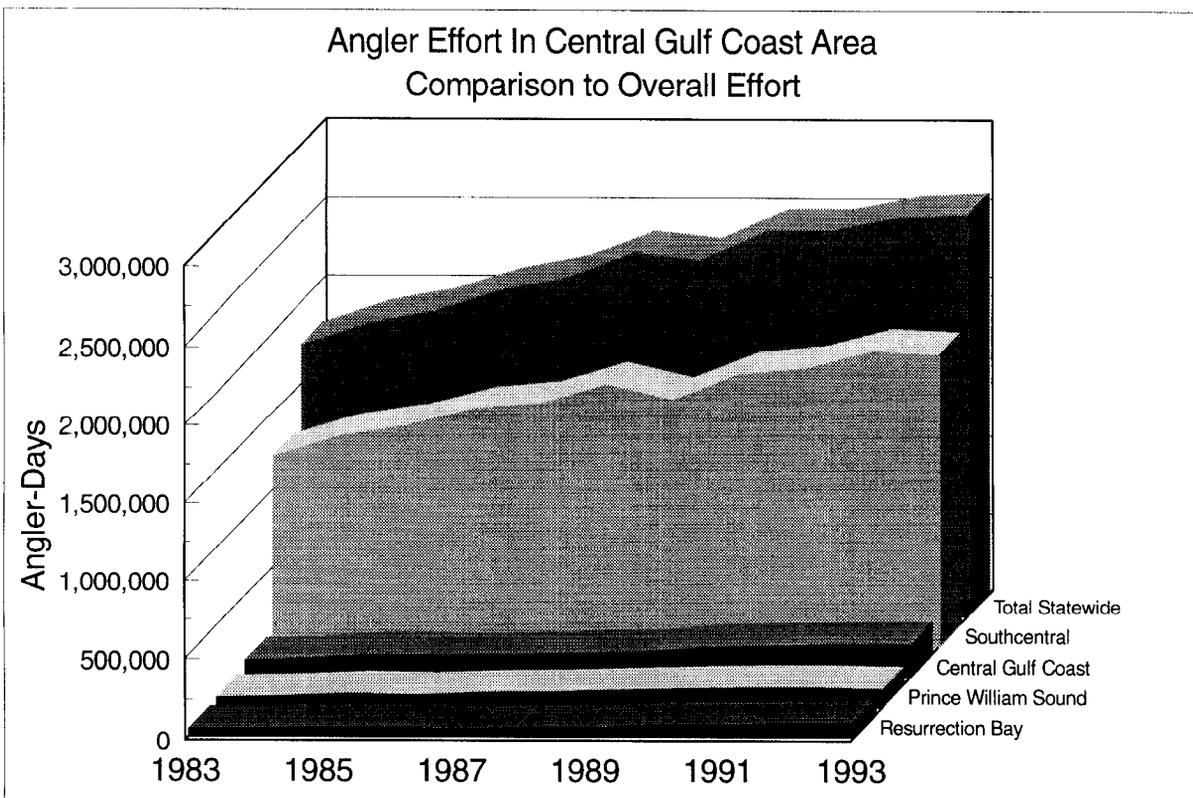


Figure 2.-Relative magnitude of angler effort expended sport fishing in the Central Gulf Management Area.

Historically, the majority of recreational angler effort (nearly 59%) from the CGMA has occurred in PWS. From 1983 through 1992, PWS has supported an average of 83,573 angler-days of sport fishing effort (Table 1). In comparison, average sport effort for Resurrection Bay from 1983 through 1992 has been 57,727 angler-days.

The most popular fishing ports in the CGMA in terms of recreational angling effort have been Seward and Valdez (Table 2 and Figure 3), the only road accessible ports in the area. This demonstrates the influence that road access has on angler participation. In 1993, anglers from these two ports accounted for nearly 75% of the recreational angling effort expended in the CGMA. The majority of the angling effort in both ports was expended by saltwater boat anglers. Information is not available to delineate exact locations where all anglers were fishing in the marine waters, but anglers have been traveling further from these ports in recent years as is demonstrated by data from Seward between 1973 and 1991 (Figure 4). This trend had continued through 1993. From Seward, popular destinations include saltwater areas within Resurrection Bay and near the Chiswell and Granite islands. Some charter operators from Seward are traveling as far east as the waters of southeast Montague Island in Prince William Sound, and as far west as the Pye Islands. Charter operators from the port of Valdez regularly travel to the waters of the northeast shore of Montague Island.

Cordova and Whittier are the next most popular fishing ports in the CGMA. In 1993, anglers expended 14,943 days fishing the marine and fresh waters in the vicinity of Cordova and 16,917 days in the Whittier area (Table 2). Other popular fisheries in the CGMA include saltwater fishing along the shoreline of Eshamy Bay, and Hinchinbrook, Hawkins, and Montague islands located in PWS.

COMMERCIAL AND SUBSISTENCE SALMON HARVESTS

Salmon returning to the CGMA are harvested extensively by various commercial fisheries. For most species, commercial harvests are significantly larger than corresponding recreational harvests. Exceptions are the fisheries for coho and chinook salmon that occur out of Seward. The recreational harvests of these two salmon species are managed under Board direction for a recreational priority (refer to the Resurrection Bay Salmon Management Plan 5 AAC 21.366). Lingcod and rockfish harvests from Seward area fisheries are also larger than corresponding commercial harvests; however these fisheries are not granted a similar recreational priority.

Fish stocks of the CGMA are also harvested in various subsistence and personal use fisheries. Harvests in these fisheries are generally small.

ECONOMIC VALUE OF SPORT FISHERIES

There are no direct estimates of the economic value of the recreational fisheries of the CGMA. However, Jones and Stokes' 1986 survey of Southcentral sport fisheries estimated expenditures and net willingness to pay for resident and nonresident anglers in Resurrection Bay. In 1986, the Seward area coho salmon fishery was estimated to be valued at 1.9 million dollars. A rough approximation of the economic value of all the sport fisheries of the CGMA can be made by applying the direct expenditures per angler-day estimated for Southcentral Alaska resident and nonresident sport anglers to the estimated sport effort of the CGMA (Table 3). Based on this method, the economic value of all of the sport fisheries of the CGMA during 1986 was approximately 15 million dollars. This compares to an estimated value of 127 million dollars for

Table 2.-Number of angler-days of effort by geographical regions in the Central Gulf Management Area, 1983-1993.

| Year | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 34 | 6,946 | 102 | 151 | 34 | 7,519 | 14,584 | 42,150 | 2,192 | 16,052 | 89,764 |
| 1984 | 417 | 8,196 | 401 | 0 | 0 | 6,123 | 16,547 | 46,678 | 2,259 | 23,605 | 104,226 |
| 1985 | 345 | 1,884 | 165 | 314 | 568 | 11,064 | 4,859 | 55,759 | 1,601 | 51,862 | 128,421 |
| 1986 | 997 | 8,394 | 571 | 2,568 | 459 | 14,176 | 3,165 | 55,372 | 1,870 | 32,051 | 119,623 |
| 1987 | 1,262 | 10,451 | 665 | 852 | 856 | 15,028 | 2,043 | 44,299 | 1,890 | 48,174 | 125,520 |
| 1988 | 1,277 | 6,994 | 453 | 1,249 | 1,498 | 13,868 | 3,657 | 53,029 | 3,867 | 52,108 | 138,000 |
| 1989 | 1,868 | 16,818 | 435 | 1,365 | 893 | 10,148 | 6,458 | 50,546 | 7,762 | 49,500 | 145,793 |
| 1990 | 2,143 | 9,107 | 352 | 1,852 | 2,749 | 11,255 | 3,054 | 72,181 | 3,318 | 71,909 | 177,920 |
| 1991 | 1,610 | 16,070 | 1,515 | 1,886 | 2,475 | 13,646 | 3,890 | 73,683 | 3,176 | 68,794 | 186,745 |
| 1992 | 4,043 | 19,222 | 1,215 | 2,414 | 3,825 | 8,980 | 8,193 | 83,568 | 4,574 | 60,952 | 196,986 |
| 1993 | 3,637 | 14,943 | 616 | 1,509 | 936 | 16,917 | 7,843 | 90,274 | 4,518 | 53,658 | 194,851 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 1,400 | 10,408 | 587 | 1,265 | 1,336 | 11,181 | 6,645 | 57,727 | 3,251 | 47,501 | 141,300 |
| % CHANGE of 1993 FROM MEAN | 160% | 44% | 5% | 19% | -30% | 51% | 18% | 56% | 39% | 13% | 38% |

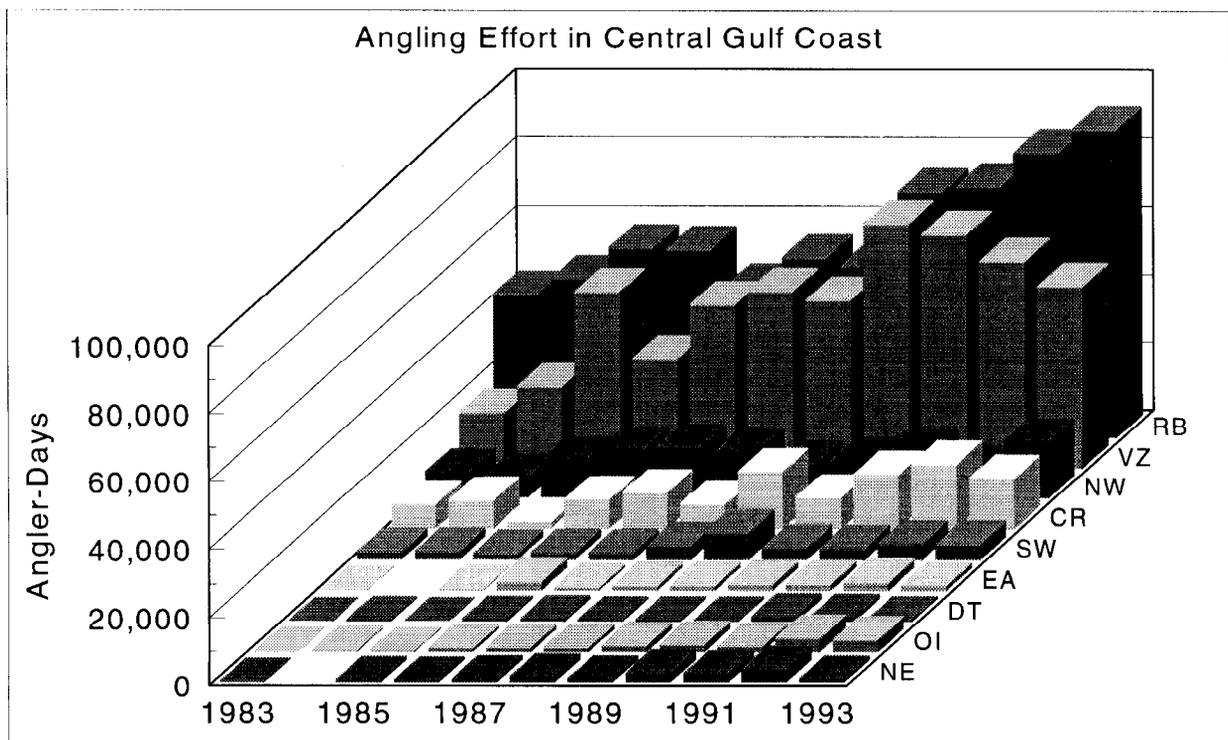


Figure 3.-Major components of angler effort by geographical regions in the Central Gulf Management Area, 1983-1993.

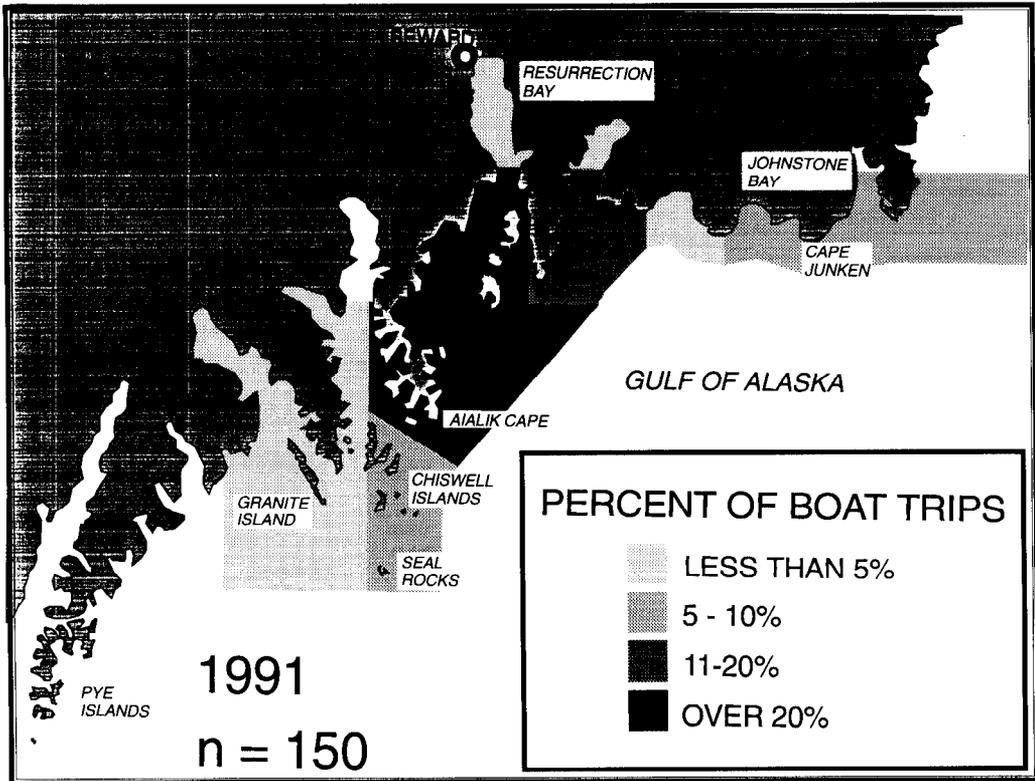
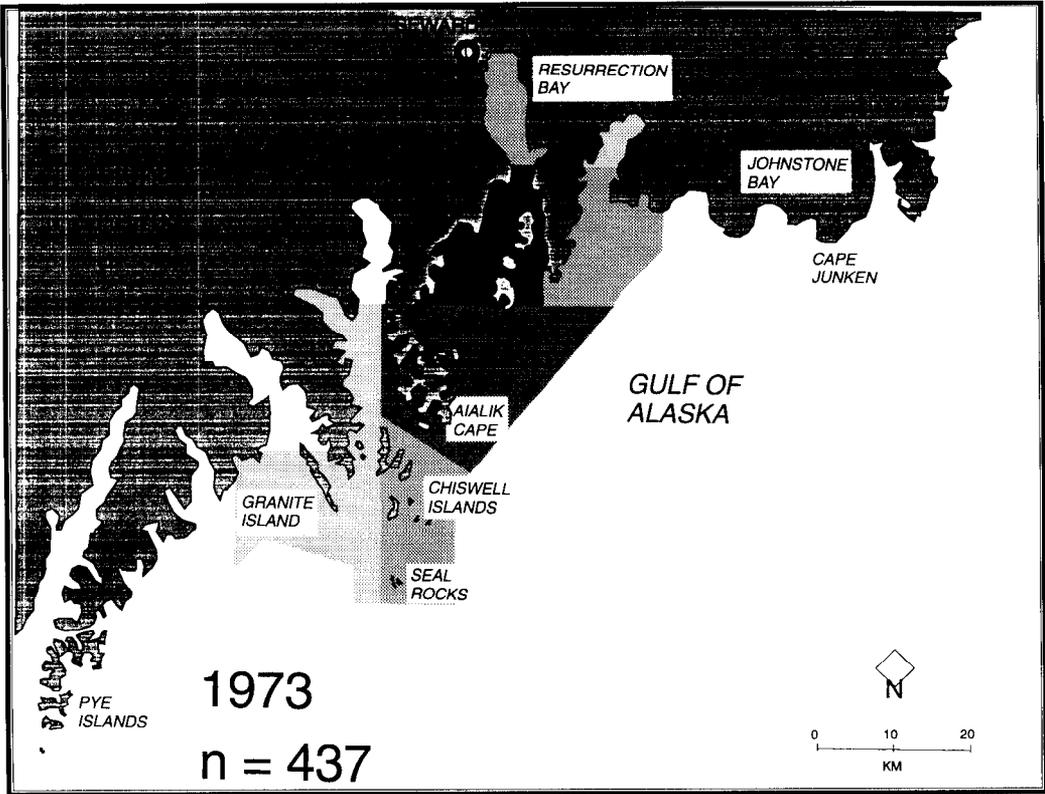


Figure 4.-Expansion of the area fished by the sport fleet based in Seward between 1973 and 1991.

Table 3.-Estimated economic value of Central Gulf Management Area sport fisheries during 1993.

| Angler Type | Southcentral Alaska | | | Central Gulf Management Area | | |
|--------------|------------------------------------|-------------------------------------|---------------|------------------------------------|-------------------------------------|--------------|
| | Number of Angler-Days ^a | Value of an Angler-Day ^b | Expenditures | Number of Angler-Days ^c | Value of an Angler-Day ^b | Expenditures |
| Resident | 1,301,567 | \$64.29 | \$83,677,742 | 135,823 | \$64.29 | \$8,732,049 |
| Non-Resident | 565,666 | \$262.51 | \$148,492,982 | 59,029 | \$262.51 | \$15,495,734 |
| Total | 1,867,233 | | \$232,170,724 | 194,852 | | \$24,227,783 |

^a From Mills 1993.

^b From Jones and Stokes 1987.

^c Calculated by multiplying Southcentral angler days by the portion of angler effort contributed from CGMA.

Southcentral Alaska sport fisheries during 1986 (Jones and Stokes Associates, Inc. 1987). Since 1986, the number of angler days expended in the CGMA has increased by approximately 60%, therefore direct expenditures by anglers participating in the fisheries of the CGMA less any inflation are estimated to be at least 24 million dollars.

STOCKING PROGRAM INVENTORY

Stocking of hatchery fish has been used to increase and diversify the opportunities available to anglers in CGMA. Various species at several life stages have been stocked. This includes five species of salmon, rainbow trout catchables and fingerlings and Arctic grayling fry (Tables 4 and 5). All of the salmon releases contribute to the common property fisheries. The releases of resident species, while common property, are more directed towards increasing opportunity for sport anglers. For PWS, the releases of coho and chinook salmon at Shakespeare Creek in Whittier, Fleming Spit in Cordova, and at the Valdez Fisheries Development Association (VFDA) Hatchery and 6.5 Mile Creek in Valdez are primarily intended to provide fish for the sport fisheries. The remaining salmon releases (which include releases of pink, chum, and sockeye salmon at various locations and coho and chinook salmon at Lake Bay) in PWS were intended to provide fish primarily for the commercial fishery, with any sport harvest being incidental. In Resurrection Bay, the coho and chinook salmon releases are intended exclusively for the sport fishery, whereas the sockeye release is intended primarily for the commercial fishery.

PRINCE WILLIAM SOUND REGIONAL PLANNING TEAM

Title 16, Sec. 16.10.380 stipulates that the commissioner will establish regions and regional planning teams (RPT) for the purpose of developing comprehensive salmon management plans for various regions of the state. A regional planning team has been established for Prince William Sound. The team is comprised of representatives from the regional private nonprofit hatchery corporation (Prince William Sound Aquaculture Association), commercial fishers, and representatives from two ADF&G fisheries divisions. The RPT develops and recommends

Table 4.-Hatchery releases in PWS 1988-1994, and planned 1995 releases.

| Stocking location | Size | Number of fish released | | | | | | | Planned 1995 | Broodstock | | |
|--------------------------------------|------------|-------------------------|-------------|------------|------------|------------|-------------|-------------|-----------------|-----------------------|----------------|--------------|
| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | | Hatchery ^a | Original | Current |
| COHO SALMON | | | | | | | | | | | | |
| Solomon Gulch Hatchery | Smolt | 821,769 | 986,792 | 787,153 | 962,872 | 1,226,044 | 481,338 | 901,303 | 1,380,120 | VFDA - SGH | Valdez Streams | SGH |
| Boulder Bay | Smolt | | | 20,000 | 30,761 | 0 | 20,000 | 13,784 | 0 | VFDA - SGH | Valdez Streams | SGH |
| Fleming Spit | Smolt | | 69,400 | 54,814 | | | 0 | 0 | 0 | State - Ft. Rich | Mile 18 | Fleming Spit |
| | Smolt | | | | 40,000 | 123,685 | 99,848 | 98,628 | 100,000 | PWSAC - WNH | Corbin Creek | Mile 18 |
| Whittier Army Dock | Smolt | 107,428 | | | | | | | | State - Ft. Rich | Mile 18 | Fleming Spit |
| Whittier Harbor | Smolt | | 82,429 | 87,971 | | | | | | State - Ft. Rich | Mile 18 | Fleming Spit |
| Shakespeare Creek, Whittier Lake Bay | Smolt | | | | 100,000 | 143,829 | 99,951 | 103,471 | 100,000 | PWSAC - WNH | Corbin Creek | Mile 18 |
| | Smolt | 887,666 | 2,499,106 | 2,397,419 | 2,083,292 | 1,563,711 | 1,103,278 | 1,282,837 | 1,900,000 | PWSAC - WNH | Mile 18 | WNH |
| CHINOOK SALMON | | | | | | | | | | | | |
| Solomon Gulch Hatchery | Smolt | | | | | 94,748 | 0 | 0 | 0 | PWSAC-VFDA | Deshka R. | WHN |
| 6.5 MILE Creek, Port Valdez | Smolt | | | | 184,000 | 95,351 | 198,693 | 0 | 0 | PWSAC - WNH | Deshka R. | WHN |
| Fleming Spit | Smolt | | | | 60,000 | 102,116 | 114,045 | 99,334 | 100,000 | PWSAC - WNH | Deshka R. | WHN |
| Shakespeare Creek, Whittier Lake Bay | Smolt | | | | 100,000 | 101,668 | 84,961 | 98,302 | 100,000 | PWSAC - WNH | Deshka R. | WHN |
| | Smolt | 45,000 | 144,934 | 138,609 | 239,624 | 275,012 | 273,429 | 394,606 | 400,000 | PWSAC - WNH | Deshka R. | WHN |
| Cherego | Smolt | | | | | | | 50,318 | 50,000 | PWSAC - WNH | Deshka R. | WHN |
| PINK SALMON | | | | | | | | | | | | |
| Solomon Gulch Hatchery | Fry | 114,033,083 | 114,030,000 | 75,204,183 | 82,879,067 | 86,902,414 | 141,868,041 | 149,370,000 | ???? | VFDA - SGH | Valdez Streams | SGH |
| CHUM SALMON | | | | | | | | | | | | |
| Solomon Gulch Hatchery | Fry | 1,613,896 | 2,920,000 | 3,103,886 | 1,736,374 | 2,690,414 | 18,238,446 | 6,000,000 | discontinued | VFDA - SGH | Valdez Streams | SGH |
| SOCKEYE SALMON | | | | | | | | | | | | |
| Eyak Lake | Smolt | | | | 47,699 | | | | | PWSAC - Main Bay | Eyak Lake | Eyak Lake |
| Coghill Lake | Fry | | | | 443,000 | | 330,296 | | | PWSAC - Main Bay | Coghill Lk. | Coghill Lk. |
| Davis Lake | Fry | 657,287 | | | | | | | | PWSAC - Main Bay | Coghill Lk. | Coghill Lk. |
| Eshamy Lake | Fry | | | | 865,000 | 406,984 | | | | PWSAC - Main Bay | Eshamy Lake | Eshamy Lake |
| Esther Pass Lake | Fry | 153,031 | 154,644 | | | | | | | PWSAC - Main Bay | Coghill Lake | Coghill Lake |
| | Fry | | | 25,000 | | | | | | PWSAC - Main Bay | Eshamy Lake | Eshamy Lake |
| Pass Lake | Fry | 594,210 | 603,219 | | | | | | | PWSAC - Main Bay | Coghill Lake | Coghill Lake |
| | Fry | | | 100,000 | | | | | | PWSAC - Main Bay | Eshamy Lake | Eshamy Lake |
| Coghill River | Smolt | | | | | 720,446 | 806,218 | 889,158 | 800,000 | PWSAC - Main Bay | Coghill Lake | Coghill Lake |
| Marsha Bay | Smolt | | | | | 91,405 | 0 | 0 | 0 | PWSAC - Main Bay | Coghill Lake | Coghill Lake |
| Eshamy River | Pre-smolt | | | | | 1,043,356 | 966,750 | 691,633 | 750,000 | PWSAC - Main Bay | Eshamy Lake | Eshamy Lake |
| Main Bay | Smolt | | | | | 63,829 | 0 | 90,358 | 77,500 | PWSAC - Main Bay | Eyak Lake | Eyak Lake |
| Main Bay | Smolt | | | | | 826,541 | 2,607,284 | 2,400,666 | 2,400,000 | PWSAC - Main Bay | Coghill Lake | Coghill Lake |
| Main Bay | Smolt | | | | | 1,025,145 | 0 | 761,797 | 750,000 | PWSAC - Main Bay | Eshamy Lake | Eshamy Lake |
| ARCTIC GRAYLING | | | | | | | | | | | | |
| Mile 31 | Fry | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | | | | |
| Mile 28 5 Lake | Fry | 10,000 | | | | | | | | | | |
| Alaganik Slough Lake | Fry | | | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | | State - Clear | Moose Ck. | Moose Ck. |
| Pipeline Lake # 1 | Fry | | | 1,100 | 10,000 | 10,000 | 10,000 | 10,000 | | State - Clear | Moose Ck. | Moose Ck. |
| Pipeline Lake # 2 | Fry | | 10,000 | | | | | | | State - Clear | Moose Ck. | Moose Ck. |
| Pipeline Lake # 4 | Fry | | | | 10,000 | 10,000 | 10,000 | 10,000 | | State - Clear | Moose Ck. | Moose Ck. |
| Sheridan Dike Pond # 1 | Fry | 10,000 | | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | | State - Clear | Moose Ck. | Moose Ck. |
| Sheridan Dike Pond # 2 | Fry | 10,000 | | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 15,000 | State - Clear | Moose Ck. | Moose Ck. |
| Thompson Lake | Fry | 10,000 | 10,000 | | 10,000 | 0 | 10,000 | 0 | 10,000 | State - Clear | Moose Ck. | Moose Ck. |
| RAINBOW TROUT | | | | | | | | | | | | |
| Crater Lake | Fingerling | 5,762 | | 5,009 | | 3,400 | | 1,600 | | State - Ft. Rich | Swanson R. | Swanson R. |
| Pipeline Lake # 4 | Fry | | | 5,200 | | | | | | State - Ft. Rich | Swanson R. | Swanson R. |
| Granite Bay 171 | Fingerling | | | 6,677 | | | | | | State - Ft. Rich | Swanson R. | Swanson R. |
| Ruth Pond | Catchable | 545 | 1,002 | 715 | 1,052 | 1,021 | 504 | 518 | 1,000 | State - Ft. Rich | Swanson R. | Swanson R. |
| Blueberry Lake | Fingerling | 2,463 | | 2,000 | | 2,000 | | 2,000 | | State - Ft. Rich | Swanson R. | Swanson R. |
| | Catchable | | | | | | | | 1,000 | State - Ft. Rich | Swanson R. | Swanson R. |
| Worthington Lake | Fingerling | 8,000 | 7,970 | | 8,014 | | 8,000 | | | State - Ft. Rich | Swanson R. | Swanson R. |
| | Catchable | | | | | | | | 1,000 | State - Ft. Rich | Swanson R. | Swanson R. |

- ^a VFDA - Valdez Fisheries Development Association
 SGH - Solomon Gulch Hatchery
 State - State operated hatchery
 Fort Richardson
 Clear
 PWSAC - Prince William Sound Aquaculture Corporation
 WNH - Wally Noerenberg Hatchery
 Main Bay

Table 5.-Hatchery releases in Resurrection Bay 1988-1994, and planned 1995 releases.

| Stocking location | Size | Number of fish released | | | | | | | Planned | Hatchery ^a | Brood stock |
|-----------------------|-----------|-------------------------|---------|-----------|-----------|---------|-----------|---------|-----------|-----------------------|--------------------|
| | | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | | |
| COHO SALMON | | | | | | | | | | | |
| Bear Lake | Fry (0) | 347,173 | 491,340 | 333,211 | 390,060 | 230,800 | 450,000 | 334,649 | 450,000 | CIAA - Trail Lakes | Bear Lake |
| Bear Creek | Fry (0) | | | | | | | 170,588 | | CIAA - Trail Lakes | Bear Lake |
| | Smolt (1) | | | 93,694 | | 51,733 | | | 10,000 | CIAA - Trail Lakes | Bear Lake |
| Lowell Creek | Smolt (1) | 63,806 | 66,606 | 63,733 | 30,400 | 59,492 | 64,361 | 38,000 | 54,000 | State - Elmendorf | Bear Lake |
| Seward Lagoon | Smolt (0) | | 93,353 | 88,777 | 84,057 | 98,700 | 40,635 | 78,565 | | State - Elmendorf | Bear Lake |
| | Smolt (1) | 118,741 | 58,808 | 56,842 | 35,000 | 55,519 | 118,480 | 143,012 | 108,000 | State - Elmendorf | Bear Lake |
| CHINOOK SALMON | | | | | | | | | | | |
| Lowell Creek | Smolt (0) | 95,673 | 122,800 | 216,220 | 93,200 | 108,390 | 104,870 | 104,477 | 105,000 | State - Elmendorf | Crooked Cr. |
| Seward Lagoon | Smolt (0) | 109,020 | 109,464 | 112,831 | 99,665 | 114,810 | 107,230 | 96,650 | 105,000 | State - Elmendorf | Crooked Cr. |
| | Smolt (1) | | | | 273,500 | 104,000 | 100,000 | 68,946 | 110,000 | CIAA - Crooked Cr. | Crooked Cr. (late) |
| Spring Creek | Smolt (0) | | 75,063 | | | | | | | State - Elmendorf | Crooked Creek |
| SOCKEYE SALMON | | | | | | | | | | | |
| Bear Lake | Fry (0) | | | 2,218,902 | | 878,529 | 1,765,900 | | | CIAA - Trail Lakes | Big River |
| | Fry (0) | | | 20,185 | 1,530,000 | 917,100 | | | | CIAA - Trail Lakes | Upper Russian |
| | Fry (0) | | | | | | 46,900 | 168,772 | 400,000 | CIAA - Trail Lakes | Bear Lake |
| Bear Creek | Smolt (1) | | | 158,816 | 74,922 | 565,489 | | | | CIAA - Trail Lakes | Big River |
| Grouse Lake | Smolt (1) | | | | | | | 574,345 | 1,000,000 | CIAA - Trail Lakes | |

^a State - State operated hatchery
 Elmendorf Hatchery
 CIAA - Cook Inlet Aquaculture Association
 Trail Lakes Hatchery
 Crooked Creek Hatchery

regional comprehensive salmon plans for approval by the Commissioner of ADF&G, solicits public input and arranges for public review of the plans throughout the region, reviews and comments on hatchery permit applications and other proposed enhancement and nonregulatory rehabilitation projects, and reviews and comments on proposed hatchery permit suspensions and/or revocations.

The Prince William Sound RPT has finalized a Phase III plan for salmon production in PWS. Key components in the plan include proposed salmon production numbers for each hatchery in PWS and criteria for evaluating remote releases.

ACCESS PROGRAMS

The Wallop-Breaux Amendments to the Federal Aid in Sport Fish Restoration program mandate that at least 12.5% of the federal funds passed on to states be used on the development and maintenance of boating access facilities. A broad range of access facilities can be approved for funding if constructed to achieve an ADF&G fishery management objective. These facilities can include boat ramps and lifts, docking and marina facilities, breakwaters, fish cleaning stations, rest rooms and parking areas. There are several completed, currently active or potential access projects in the CGMA.

Completed projects are:

1. Allison Point Access Project. An access project at Allison Point near Valdez was completed in the summer of 1994. Allison Point is the most popular shore fishing site in the Valdez area and draws large numbers of anglers and tourists each year, many arriving by motor home. Anglers harvested approximately 23,000 pink salmon and expended 25,000 angler-days at Allison Point in 1990. Allison Point is one of only two locations in the Valdez area where shore-based anglers can effectively harvest pink and coho salmon. Prior to this project access to the beach at Allison Point was crude and hazardous. The large boulders forming the embankment that parallels the beach near Allison Point were difficult and dangerous to traverse. Limited sanitation facilities and garbage receptacles were provided during the summer by the City of Valdez.

The access project for Allison Point provided a developed trail to the beach for shore anglers, upgraded the existing parking area, and constructed permanent rest room facilities and garbage receptacles. The trail, rest rooms, and parking spaces were constructed to accommodate handicapped anglers. The Allison Point access project was a cooperative agreement between the City of Valdez, Alaska Department of Fish and Game, and Alaska Department of Transportation and Public Facilities. The total cost of the project was approximately \$140,000.

2. Seward Harbor Boat Ramp. In response to a request from the City of Seward, the department has assisted in constructing an additional boat ramp for the Seward Boat Harbor. Because of Seward's proximity to Anchorage and increased recreational fishing in the area, boaters were overwhelming existing facilities. Effort has increased approximately twofold in the 6 years prior to initiating the project, from approximately 30,000 angler-days in 1986 to over 60,000 angler-days in 1991. With the increase in use, especially during the coho salmon derby, the harbor was extremely congested. The impact of the congestion at the existing boat ramp caused long delays in launching of vessels due to the difficulty in finding parking which is

often in excess of one-half mile from the ramp. The City of Seward did not have the financial capability to meet all the increasing demands for public use.

An additional boat ramp was constructed on the east side of the harbor. This ramp split the traffic flow from the existing ramp and opened up new parking areas adjacent to the newly constructed ramp. The primary advantage of having adequate parking adjacent to the ramp is the reduction of launch and retrieval time for the boat owner, thereby improving traffic flow near the facility, with a cost of approximately \$468,000. Construction was completed by early summer of 1995.

Seward has also received a \$40,000 grant for a sewage pumpout station to be installed on harbor floats. This station will be accessible by recreational and commercial watercraft.

Currently active projects are:

1. Whittier Boat Ramp Project. The Whittier area is a popular sport fishing site from June through August when hatchery produced chinook and coho salmon return. At the present time, there are limited support facilities for anglers in the Whittier area. Correspondence from the City of Whittier and the Whittier harbormaster cite limited launch facilities as the primary limitation to recreational activities in the Whittier area. The goal of this project is the construction of a launch facility at Smitty's Cove, west of the current facility, thus providing improved access to northwest Prince William Sound fisheries. The feasibility of this project at this time is questionable due to potential conflicts with other users and a property dispute at the site. A decision by the City of Whittier on whether to proceed is pending. The estimated cost of this project is approximately \$240,000

Potential access projects (listed in order of priority at time of printing):

1. South Esther Island Public Use Dock: Alaska State Parks manages 19 marine parks in the CGMA (14 parks in Prince William Sound and 5 in Resurrection Bay). The development of these parks will follow demonstrated public use trends. The marine park on the south shore of Ester Island has experienced sharp increases in recreational angling activity because of the returns of four species of salmon to the hatchery in Lake Bay, and its ease of access by boat and float plane. This increase in angler activity has increased conflicts with the hatchery facility and increased degradation of the shoreline. Alaska State Parks has formally requested assistance from ADF&G for the construction of a public use dock similar to the structure just completed at Halibut Cove in Kachemak Bay. The Halibut Cove project was also a cooperative effort with Parks and ADF&G using access funding. This new project would consist of the construction of a 120 ft aluminum floating dock on pilings connected to land by a detachable ramp system. The estimated cost is in the range of \$250,000 to \$280,000. This dock would complement the plans Parks has for the development of camping facilities, public use cabins, latrines, fish cleaning tables and trails. This would also direct angler traffic away from the hatchery facility.
2. Green Island Handicapped Boat Ramp: The U.S. Forest Service has requested assistance in the development of a boat ramp designed to allow access to the cabin they recently completed on Green Island for use by handicapped individuals. Green Island is a popular coho salmon and cutthroat trout fishing destination. This assistance would involve ADF&G purchasing about \$15,000 in materials. All logistics and labor would be handled by USFS.

3. Mooring Buoys: The USFS and Park Service currently maintain several mooring buoys in PWS and along the eastern Kenai Peninsula. An access project could be developed to work in cooperation with these agencies to identify additional sites or replacement of lost or damaged buoys. These could be purchased through the access program and turned over to these agencies for installation and maintenance.
4. Eyak River Flyfishing Area Access: The Eyak River north of the Copper Highway bridge outside Cordova, provides a popular sport fishery that is readily road accessible from Cordova. Recent highway renovation near the bridge by the Department of Transportation and Public Facilities (DOTPF) has created a problem with access to the traditional fishery site. The road to the fishing site has been blocked by highway guardrails and a new parking area was constructed across the river. The bridge is not designed for pedestrian traffic in addition to vehicular. This project would fund the construction of a pedestrian/bicycle pathway added to the existing bridge. The Eyak River site near the Copper Highway Bridge has been a popular and traditional sport fishing location for the residents of Cordova. Recent highway upgrades and safety work have actually created a safety hazard by requiring that people using the newly constructed parking turnout must cross a bridge not constructed for pedestrian traffic to access the fishing site. This subjects the users to substantial risk from vehicles using the highway. The addition of a pedestrian/bicycle pathway to the existing bridge would eliminate this hazard plus create a safe crossing site for other nonvehicular users of the bridge. The existing safety and upgrade work recently completed would not need to be altered to add this pathway. This project was submitted for consideration under the Governor's TRAAK (Trails and Recreational Access for Alaska) program for funding.
5. Boat Harbor Directory: A directory of boat harbors in Southeast Alaska was recently completed as an access project for recreational boaters. The development of a similar directory to include Prince William Sound and the eastern Kenai Peninsula would be a valuable asset to recreational boaters in Southcentral Alaska. There are very few actual boat harbors in PWS, however there are several mooring buoys maintained by the USFS and Park Service, and traditionally used safe anchoring points. These could also be included in the directory. This directory could potentially include the Kodiak and Cook Inlet areas.
6. Whittier Shoreline Development: Regardless of the outcome of the Smitty's Cove boat launch, several other projects could be developed to provide better access and facilities for anglers. Sanitation and fish cleaning facilities could be provided along the breakwaters surrounding the small boat harbor and at Cove and Shakespeare creeks, two of the most popular fishing sites. An informational kiosk could be developed to inform anglers of fishing opportunities in western PWS, management concerns of the local fisheries such as lingcod and rockfish, and general life history information of fishes in PWS. There is a possibility that anglers will be able to drive to Whittier by the late 1990s. With an aggressive enhancement program and improved access, the Whittier area has the greatest potential of all the ports in PWS to provide increased fishing opportunities. Recent conversations with the Whittier city engineer and Harbormaster indicate that there is potential for Sport Fish Division's participation in the current harbor upgrade planning. In addition inquiries have been made regarding the development of a marine park at Shotgun Cove which is easily accessible by boat from Whittier.

7. Valdez Area Facilities: The Valdez area supports the largest sport fishery in PWS and the second in the CGMA. The majority of this effort is by boaters in salt water. Projects that could improve boating facilities in the Valdez area should be investigated. Recent conversations with the DOT engineer stationed in Valdez indicated that an excellent use of Sport Fish effort and dollars would be the expansion of the Valdez harbor to provide increased docking facilities for recreational boaters. This could consist of an additional ramp, docks and parking similar to the project just completed in Seward.
8. Village Recreational Facilities: The villages of Chenega and Tatitlek have limited facilities for recreational boaters. Current facilities are primarily used by locals and commercial fishermen. Availability of recreational facilities such as pumpout stations, rest room facilities and docking or mooring facilities would increase opportunities for recreational boaters while not impacting current use patterns.
9. Fleming Spit Access Project: Fleming Spit is located just north of Cordova along Orca Inlet. This area is a popular sport fishing site June through August. The Fleming Spit fishery is a terminal fishery for hatchery produced chinook and coho salmon. At the present time, anglers wishing to fish this area are forced to park on the shoulder of the road. This road receives heavy use by logging trucks while accessing a log transfer facility near Fleming Spit. During periods of high use, a dangerous traffic situation involving pedestrians develops. The goal of this project would be to utilize land currently owned by SeaAlaska Corporation located on the upland side of the road to construct a parking area adequate for approximately 30 vehicles. Additionally, handicap-accessible rest rooms and garbage receptacles would be constructed. The Department of Fish and Game negotiated with SeaAlaska Corporation in 1989-1990 for the purchase of land to develop the parking area and construction of rest rooms at Fleming Spit. This project has been on hold pending action by the City of Cordova regarding current land use, however it was recently proposed to the *Exxon Valdez* Oil Spill Trustees Council by the Cordova Sporting Club as a restoration project (#95080) using state restitution funds.

MANAGEMENT AREA FISHERY OBJECTIVES

Fishery objectives for CGMA sport fisheries continue to evolve as each fishery becomes better understood. Unless specific fishery objectives have been established and are described in Section II of this report, the objective of past and current fisheries management is to assure for the sustained yield of the various fish stocks that occur within the CGMA, while assuring continued, and where possible expanded, opportunity to participate in fisheries targeting these stocks. The specific fishery objectives that have been developed are for the sport fisheries supported by hatchery releases of coho and chinook salmon in Resurrection Bay and at the ports of Valdez, Cordova, and Whittier.

MANAGEMENT PLANS AFFECTING SPORT FISHERIES IN THE CGMA

The Board of Fisheries has established several management plans and policies to guide the fisheries of the CGMA. These plans provide for the sustained yield of the area's fisheries as well as establishing allocations and management guidelines for department fisheries managers. Management plans and policies established for the CGMA include:

1. Bear Lake Management Plan 5 AAC 21.375. This management plan establishes guidelines for the enhancement of coho and sockeye salmon in Bear Lake near Seward. In essence, the

plan provides for the enhancement of sockeye salmon in Bear Lake intended for commercial use in Resurrection Bay, provided the enhancement does not negatively impact coho salmon smolt production from Bear Lake.

2. Resurrection Bay Salmon Management Plan 5 AAC 21.376. This management plan provides allocation and management guidelines for the salmon fisheries of Resurrection Bay. In essence, the plan stipulates that the coho and chinook salmon fisheries of Resurrection Bay be managed exclusively for recreational uses and provides for a commercial fishery for other salmon species insofar as the prosecution of these fisheries does not interfere with the recreational fishery in Resurrection Bay.
3. Lower Cook Inlet Seine Fishery Management Plan 5 AAC 21.369. This management plan stipulates that the seine fishery in Lower Cook Inlet waters be managed so that its efforts be directed primarily on Lower Cook Inlet salmon stocks and not Upper Cook Inlet salmon stocks.
4. Copper River District Salmon Management Plan 5 AAC 24.360. This management plan provides for a limited chinook salmon commercial fishery during years when the Copper River District commercial salmon fishery is closed. The plan also provides department fishery managers with specific management guidelines for this fishery.
5. Port San Juan Salmon Hatchery Management Plan 5 AAC 24.365. This plan stipulates that the department, in consultation with the hatchery operator, shall manage the Point Elrington and Port San Juan fishing subdistricts to achieve Prince William Sound Aquaculture Corporation's (PWSAC) escapement goal for the Port San Juan Salmon Hatchery.
6. Solomon Gulch Salmon Hatchery Management Plan 5 AAC 24.366. This plan stipulates that the department, in consultation with the hatchery operator, shall manage the Valdez Narrows fishing subdistrict to achieve the VFDA's pink salmon escapement goal for the Solomon Gulch Salmon Hatchery. The plan further stipulates the department may manage those waters of Valdez Arm south to the latitude of Rocky Point to assist meeting this goal. The plan also defines a terminal harvest area for the Solomon Gulch Hatchery.
7. Main Bay Salmon Hatchery Management Plan 5 AAC 24.367. The purpose of this management plan is to provide an equitable distribution of harvest opportunity and to reduce conflicts between users in the vicinity of the Main Bay Salmon Hatchery. The plan also provides department fishery managers with specific management guidelines to accomplish this goal.
8. Esther Island Hatchery Management Plan 5 AAC 24.368. This plan stipulates that the department, in consultation with the hatchery operator, shall manage the Esther fishing subdistrict to achieve PWSAC's escapement goal for the Esther Island Salmon Hatchery. The plan also provides department fishery managers with specific management guidelines to accomplish this goal.
9. Prince William Sound Pot Shrimp Fishery Management Plan 5 AAC 31.260. This management plan provides department fishery managers with specific management guidelines and harvest strategies for the pot shrimp fishery in Prince William Sound.

10. Copper River Subsistence Salmon Fisheries Management Plan 5 AAC 01.647. The purpose of this management plan is to ensure that an adequate escapement of salmon in the Copper River occurs and that subsistence uses, as described under AS 16.05.251 and 5 AAC 99.010, are accommodated. The plan also provides department fishery managers with specific management guidelines for this fishery.
11. Prince William Sound Subsistence Salmon Fisheries Management Plan 5 AAC 01.648. This management plan provides department fishery managers with specific management guidelines for the Prince William Sound subsistence salmon fishery.
12. Prince William Sound Herring Management Plan 5 AAC 27.365. The purpose of this management plan is to describe management strategies for all Prince William Sound herring fisheries and to provide for an optimum sustained yield and an equitable allocation for all user groups. The plan also provides department fishery managers with specific management guidelines for this fishery.

Private Nonprofit Salmon Hatchery Special Harvest Area 5 AAC 40 Article 2. This article provides for special harvest areas for private nonprofit salmon hatcheries. Included are:

13. Prince William Sound Aquaculture Cooperation Special Harvest Area-San Juan: 5 AAC 40.035
14. Solomon Gulch Special Harvest Area-Valdez: 5 AAC 40.038

Rockfish management plans are:

15. North Gulf Coast (5 AAC 28.465),
16. Prince William Sound (5 AAC 28.265)
17. Cook Inlet (5 AAC 28.365)

These management plans establish trip limits for allowable rockfish landings during a 5-day period for the North Gulf Coast, Prince William Sound, and Cook Inlet areas. The plans also establish harvest quotas for each area (150,000 pounds) after which the fishery in an area reverts to bycatch only.

MAJOR BIOLOGICAL AND SOCIAL ISSUES FOR THE CGMA

Following is a summary of the major biological issues surrounding the CGMA sport fisheries. Groundfish (halibut rockfish and lingcod) issues are covered in more detail in the North Gulf Coast groundfish annual management report (Vincent-Lang 1995).

Lingcod Stocks

Data indicate recruitment of young lingcod into populations in Gulf of Alaska coastal areas between Cape Puget and Nuka Bay is declining. The portion of the sport harvest consisting of lingcod under 27 inches in length has decreased from about 19% in 1987 to 1.5% in 1991. This decline is accompanied by increasing sport landings of lingcod in Seward. Lingcod are territorial, inhabiting rocky reefs that are easily overfished. Charter boat operators indicate that lingcod populations within range from the Port of Seward are severely depressed and anglers are having to travel further from port to maintain high catch rates. The Board of Fisheries adopted regulatory proposals in November 1992 that address many of these biological concerns. These Board actions will be reviewed in the lingcod fisheries chapter in Section II of this report.

Yelloweye and Black Rockfish Stocks

Concern for rockfish stocks arises from their inherent susceptibility to overexploitation. Most rockfishes are territorial for much of the year, inhabiting high-relief, rocky areas easily found and exploited by sport and commercial users. Over a dozen rockfish species are caught by sport anglers and many of these species are long-lived with high natural mortality rates. Most species do not recruit to sport or commercial fisheries until maturity at age 7-15. For these reasons, recovery from overharvest can take many years. Limited data from commercial test fishing and sport fishing near Resurrection Bay suggest that the abundance of older black rockfish has declined since the early 1980s (Vincent-Lang 1991). To date, resource agencies have not been able to design strategies to manage rockfish on a sustained yield basis. One suggestion is to set aside sanctuaries where all bottom fishing is prohibited. These sanctuaries would then act as the possible brood or reseed source for surrounding areas that have been overharvested.

Cutthroat Trout in Prince William Sound

Prince William Sound is at the most northern and western extreme of the natural range for cutthroat trout. As a result, the populations of this species are small in size and distribution. Populations of fish on the outer extremes of their distribution tend to be more susceptible to environmental changes and their survival rates are highly variable. Cutthroat trout are also subject to incidental catch in the commercial fisheries which adds further risk to these small stocks. The department has concerns on whether even the present small harvest is sustainable. Select cutthroat trout stocks in the Pacific Northwest have been selected as candidates as threatened species under the Endangered Species Act. The department submitted a proposal to the BOF for the 1993-1994 meeting to establish a spring spawning season closure from April 15 through June 14, which was approved by the Board.

Coghill and Eshamy Lakes Sockeye Salmon Escapement

Historically, Coghill and Eshamy lakes have produced the highest sport harvest of sockeye salmon in PWS. These two systems accounted for slightly over 60% of the total PWS sport harvest for sockeye in 1978 and this percentage decreased drastically to less than 7% in 1990. In 1991, both of these systems were closed to harvest of sockeye salmon by emergency order and the escapement goal was once again not met for Coghill Lake in 1992. The department's current response is to rehabilitate these systems with sockeye salmon smolt produced at PWSAC's Main Bay hatchery. The department has concerns about these releases. These concerns are being addressed by ADF&G and PWSAC in the drafting of the Main Bay Hatchery Basic Management Plan.

Stocking Program

The chinook stocking programs in Whittier and Cordova are being cut back or discontinued by the Prince William Sound Aquaculture Corporation in order to bring a problem with bacterial kidney disease under control. Residents of Whittier in particular are concerned about the impact this will have on the fisheries in Passage Canal, and requests have gone to the Governor's office to request that this fishery be supplemented by the state hatchery system. Currently the state hatchery system is fully utilized with regard to king salmon production.

Greater education of the fishing public is recommended to increase utilization of stocked fish returning to terminal areas, especially in trying to develop troll fisheries for chinook salmon in

Resurrection Bay and coho and chinook salmon returning to the Wally Noerenberg Hatchery in PWS.

SECTION II: MAJOR FISHERIES OVERVIEW

The fisheries in the CGMA fall into three discreet geographical or management units: PWS, Resurrection Bay, or areawide fisheries. Some fisheries are managed similarly over the entire area while others are specific to the Resurrection Bay or Prince William Sound areas. Fisheries that will be discussed areawide include those for groundfish (halibut, rockfish and lingcod), shellfish and several minor species. The major fisheries in the Resurrection Bay area are essentially separate geographic and management units from the rest of the management area. These include a very popular coho salmon fishery, as well as chinook, pink and sockeye salmon fisheries. The groundfish fisheries in the Resurrection Bay area are fairly discreet, however they will be discussed areawide because of their management strategy. In addition groundfish are addressed in more detail in a specific groundfish management report (Vincent-Lang 1995). Fishing activities in the Resurrection Bay area originate almost entirely out of the Port of Seward. Prince William Sound fisheries are divided into eight geographically distinct areas (Figure 5). Fishing activities in the Prince William Sound area originate primarily out of the three major ports of Valdez, Cordova and Whittier.

The discussion of the fisheries that follows will be presented briefly by port, then in more detail by individual fishery. In the brief discussion by port, references to tables and figures have been omitted. Harvest and effort data in the detailed discussion by fishery will be presented by the single geographic region for Resurrection Bay (RB) and eight geographic regions for PWS areas (Figure 5), unless otherwise indicated. The eight geographic regions for PWS are: Northwest (NW), Northeast (NE), Valdez Area (VZ), Eastern (EA), Outer Islands (OI), Southwest (SW), Cordova Road System (CR) and the Copper River Delta (DT). A final category "Other" (OT) is included for those sites which were reported in the SWHS without adequate information to assign data to a specific region (e.g. PWS boat).

PORT OF VALDEZ FISHERIES

The waters of the Valdez area (Appendix A1) support the most popular fisheries in the PWS area and Valdez is the second most popular port in the CGMA in terms of recreational angling effort expended since 1983. Sport fish effort in the Valdez area has been steadily increasing since 1983. In 1983, the Valdez area fisheries accounted for 21% of the total effort expended in the CGMA and in 1993 this had increased to 28% of total effort. On average, approximately 96% of angler effort in Valdez is expended in marine waters. In 1993, 52,585 angler-days were expended in the marine waters which represents a 14% increase from the historical mean. Approximately 66% of the effort expended in marine waters is by anglers using boats (Mills 1994) (Table 6 and Figure 6). These anglers use the Valdez harbor to access marine waters throughout PWS from Hinchinbrook Entrance to Esther Island. It is not possible to delineate exact fishing locations from the Statewide Harvest Survey.

There are seven major fisheries that occur in the Valdez area. These fisheries target all five species of salmon, bottomfish, and Dolly Varden. In terms of numbers of fish harvested, the most popular fisheries are those that target pink and coho salmon. In terms of angler preference, however, the most popular fisheries are those that target coho salmon and halibut.

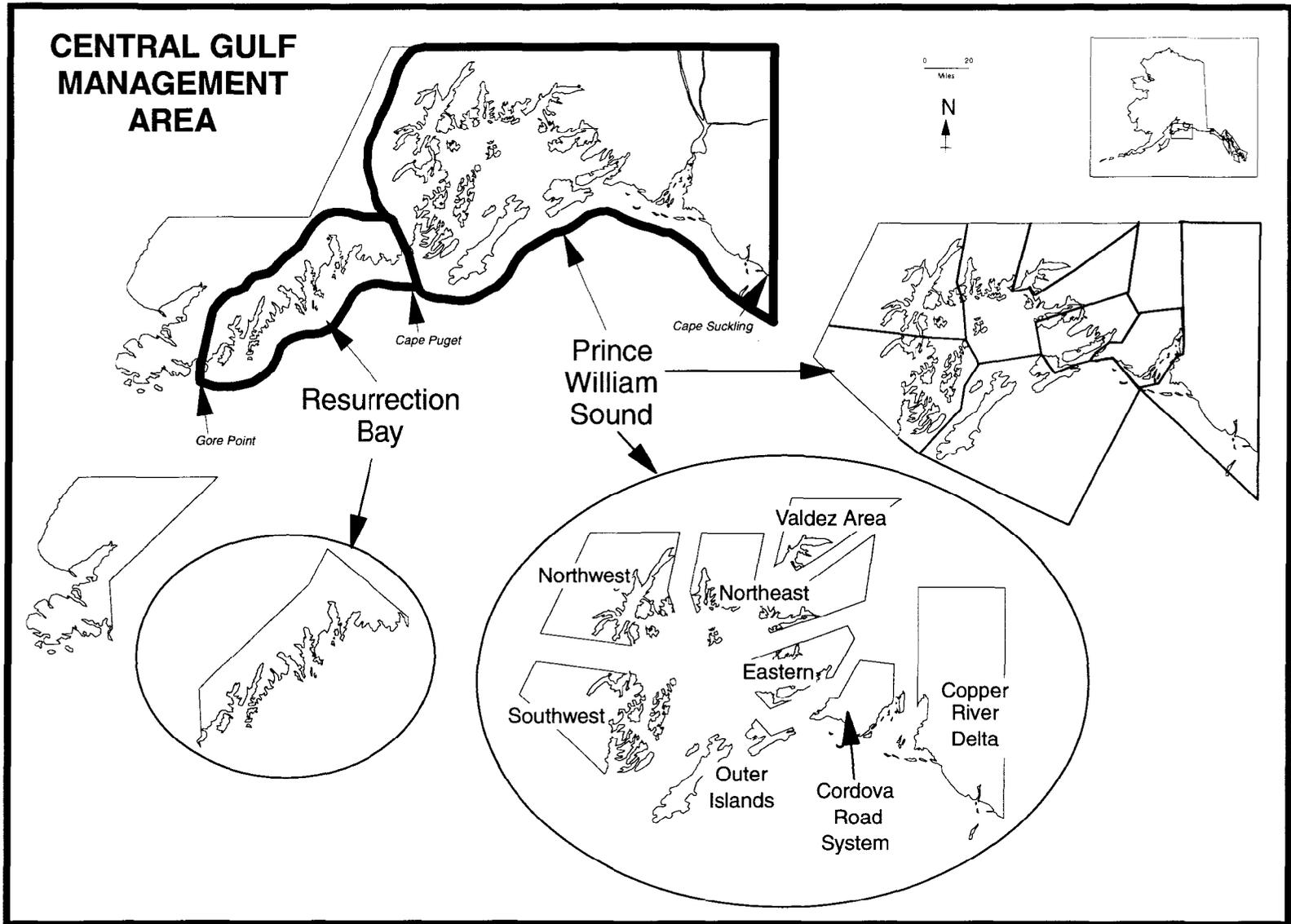


Figure 5.-Map of the geographical regions in the Central Gulf Management Area.

Table 6.-Harvest and effort expended sport fishing in the Valdez area from 1983 through 1993.

| YEAR | Freshwater Effort | Saltwater Effort | Total Effort | King Salmon | Silver Salmon | Pink Salmon | Sockeye Salmon | Chum Salmon | Dolly Varden | Lingcod | Rockfish | Halibut | Arctic Grayling | Eulachon |
|----------------------------|-------------------|------------------|--------------|-------------|---------------|-------------|----------------|-------------|--------------|---------|----------|---------|-----------------|----------|
| 1983 | 288 | 15,764 | 16,052 | 241 | 4,710 | 8,696 | 343 | 976 | 976 | 0 | 3,703 | 1,846 | 0 | 0 |
| 1984 | 4,885 | 18,720 | 23,605 | 125 | 5,138 | 9,825 | 811 | 1,397 | 9,566 | 0 | 4,402 | 1,322 | 0 | 499 |
| 1985 | 1,735 | 50,127 | 51,862 | 326 | 8,020 | 28,450 | 1,085 | 1,400 | 4,803 | 0 | 6,304 | 3,310 | 0 | 0 |
| 1986 | 2,425 | 29,626 | 32,051 | 168 | 6,911 | 22,170 | 413 | 1,865 | 5,077 | 0 | 6,366 | 3,669 | 352 | 15 |
| 1987 | 628 | 47,546 | 48,174 | 360 | 8,884 | 27,071 | 1,756 | 1,525 | 1,049 | 0 | 3,175 | 2,185 | 54 | 0 |
| 1988 | 1,012 | 51,096 | 52,108 | 227 | 10,241 | 26,776 | 1,582 | 4,201 | 983 | 0 | 6,983 | 4,599 | 182 | 3,713 |
| 1989 | 1,029 | 48,471 | 49,500 | 526 | 18,143 | 32,922 | 881 | 2,736 | 1,141 | 0 | 7,072 | 4,231 | 58 | 0 |
| 1990 | 659 | 71,250 | 71,909 | 220 | 18,630 | 46,730 | 1,630 | 1,258 | 1,341 | 0 | 4,350 | 6,045 | 114 | 3,386 |
| 1991 | 903 | 67,891 | 68,794 | 353 | 10,393 | 48,618 | 1,471 | 838 | 1,441 | 1,122 | 3,979 | 6,122 | 331 | 0 |
| 1992 | 1,552 | 59,400 | 60,952 | 317 | 17,580 | 28,596 | 2,153 | 804 | 1,622 | 1,476 | 7,625 | 8,379 | 0 | 379 |
| 1993 | 1,073 | 52,585 | 53,658 | 405 | 12,841 | 32,479 | 1,235 | 873 | 1,801 | 1,117 | 4,894 | 8,457 | 249 | 1,453 |
| 1983-1992 | | | | | | | | | | | | | | |
| MEAN | 1,512 | 45,989 | 47,501 | 286 | 10,865 | 27,985 | 1,213 | 1,700 | 2,800 | 1,299 | 5,396 | 4,171 | 156 | 799 |
| % CHANGE of 1993 FROM MEAN | -29% | 14% | 13% | 41% | 18% | 16% | 2% | -49% | -36% | -14% | -9% | 103% | 60% | 82% |

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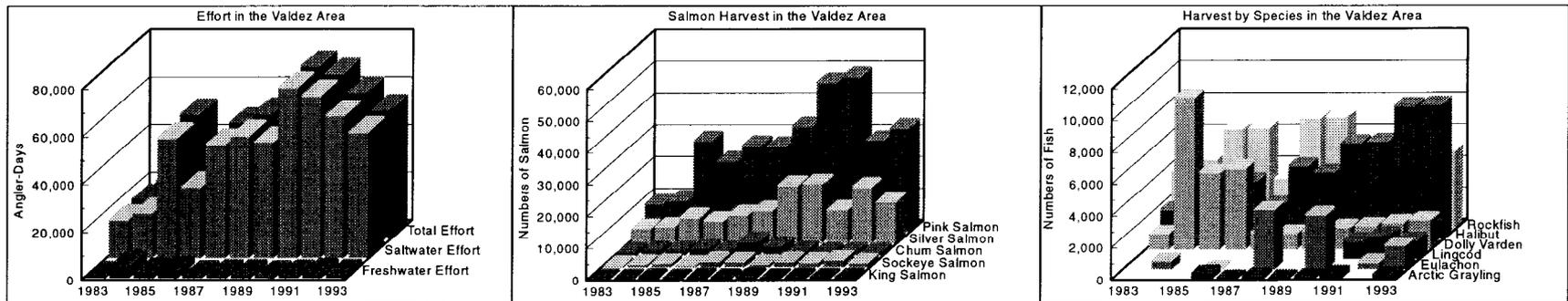


Figure 6.-Harvest and effort expended sport fishing in the Valdez area from 1983 through 1993.

PORT OF CORDOVA FISHERIES

The waters of the Cordova area (Appendix A2) support the second most popular fisheries in PWS in terms of angling effort expended since 1983. These waters on average have accounted for 8% of the angling effort expended in the CGMA. On average, approximately 60% of the effort in Cordova is expended in fresh water which is essentially the reverse of the distribution of effort in Valdez. In 1993, effort was evenly divided between salt water and fresh water. The 14,943 angler-days expended in the Cordova area represent a 44% increase from the historical mean (Table 7 and Figure 7). This increase can probably be attributed to the growing popularity of trolling for salmon in Orca Inlet and increased interest in coho fishing along the Cordova road system. Sport fisheries target salmon, bottomfish, Dolly Varden, cutthroat trout, and Arctic grayling. In terms of numbers of fish harvested, the most popular fisheries are those that target coho salmon and Dolly Varden. In terms of angler preference, the coho salmon and cutthroat trout fisheries are most popular.

PORT OF WHITTIER FISHERIES

The waters of the Whittier area (Appendix A3) support the third most popular fisheries in PWS in terms of angling effort expended since 1983. These waters on average have accounted for slightly less than 9% of the recreational angling effort expended in the CGMA. Nearly all of the angling effort is expended in marine waters since there are limited opportunities to fish in fresh water. In 1993, 16,917 angler-days were expended in the Whittier area (northwest PWS) which was a 51% increase from the historical mean. This growth appears to be a result of increased groundfish fisheries as evidenced by a 90% increase in halibut harvest and a 21% increase in rockfish harvest in 1993 (Table 8 and Figure 8). Sport fisheries target salmon, bottomfish, and Dolly Varden.

PORT OF SEWARD FISHERIES

The most popular port in the CGMA in terms of fishing effort has been Seward (Appendix A4). The waters accessed through Seward included Resurrection Bay and all coastal waters between Gore Point and Cape Puget. Charter operators often travel as far as Montague Island in PWS. On average the fisheries have accounted for 46% of the recreational angling effort expended in the CGMA. The majority of the angling effort is expended in marine waters since there are limited opportunities to fish in fresh water. In 1993, 90,038 angler-days were expended in the marine waters which is 57% higher than the historical mean (Table 9 and Figure 9). Sport fisheries target salmon, bottomfish, and Dolly Varden.

RESURRECTION BAY FISHERIES

Resurrection Bay Coho Salmon Fishery

Resurrection Bay and surrounding marine waters support the largest coho sport fishery in the CGMA. From 1983-1992, the mean harvest of coho salmon from these waters was 19,902 fish, accounting for 52% of the historical mean harvest of coho salmon in CGMA during this period (Table 10 and Figure 10). Most harvest and effort expended on these stocks takes place in marine waters by private boats (Table 11 and Figure 11); however, a growing shore-based fishery targeting these stocks has also developed in recent years. This fishery is highlighted by the 9-day Seward Silver Salmon Derby which has been held each August since 1956. Recognizing the importance of this sport fishery, the Board of Fisheries developed a management plan for the

Table 7.-Harvest and effort expended sport fishing in the Cordova area from 1983 through 1993.

Cordova Road System

| YEAR | Freshwater Effort | Saltwater Effort | Total Effort | King Salmon | Silver Salmon | Pink Salmon | Sockeye Salmon | Chum Salmon | Dolly Varden | Lingcod | Rock Fish | Halibut | Arctic Grayling | Cutthroat Trout |
|---------------------|-------------------|------------------|--------------|-------------|---------------|-------------|----------------|-------------|--------------|---------|-----------|---------|-----------------|-----------------|
| 1983 | 6,946 | 0 | 6,946 | 21 | 2,139 | 0 | 1,082 | 84 | 2,632 | 0 | 0 | 0 | 0 | 1,436 |
| 1984 | 6,574 | 1,622 | 8,196 | 0 | 2,506 | 149 | 112 | 0 | 1,245 | 0 | 37 | 237 | 0 | 873 |
| 1985 | 1,331 | 553 | 1,884 | 0 | 564 | 55 | 130 | 0 | 714 | 0 | 380 | 33 | 0 | 188 |
| 1986 | 5,615 | 2,779 | 8,394 | 11 | 3,440 | 412 | 321 | 15 | 902 | 0 | 145 | 596 | 0 | 901 |
| 1987 | 5,398 | 5,053 | 10,451 | 0 | 2,351 | 641 | 507 | 0 | 1,268 | 0 | 0 | 253 | 0 | 1,050 |
| 1988 | 2,870 | 4,124 | 6,994 | 9 | 5,311 | 364 | 600 | 236 | 1,309 | 0 | 169 | 963 | 0 | 218 |
| 1989 | 11,724 | 5,094 | 16,818 | 0 | 4,248 | 627 | 661 | 64 | 1,888 | 0 | 270 | 809 | 116 | 853 |
| 1990 | 4,526 | 4,581 | 9,107 | 34 | 3,900 | 162 | 466 | 45 | 670 | 0 | 136 | 486 | 0 | 311 |
| 1991 | 5,271 | 10,799 | 16,070 | 59 | 4,943 | 747 | 806 | 143 | 997 | 157 | 477 | 1,463 | 0 | 116 |
| 1992 | 9,641 | 9,581 | 19,222 | 321 | 5,150 | 37 | 1,578 | 38 | 1,138 | 177 | 879 | 2,305 | 16 | 632 |
| 1993 | 7,543 | 7,400 | 14,943 | 302 | 5,056 | 433 | 1,321 | 170 | 586 | 74 | 335 | 2,165 | 0 | 410 |
| 1983-1992 | | | | | | | | | | | | | | |
| MEAN | 5,990 | 4,419 | 10,408 | 46 | 3,455 | 319 | 626 | 63 | 1,276 | 167 | 249 | 715 | 13 | 658 |
| % CHANGE of 1993 | 26% | 67% | 44% | 564% | 46% | 36% | 111% | 172% | -54% | -56% | 34% | 203% | -100% | -38% |
| FROM MEAN | | | | | | | | | | | | | | |

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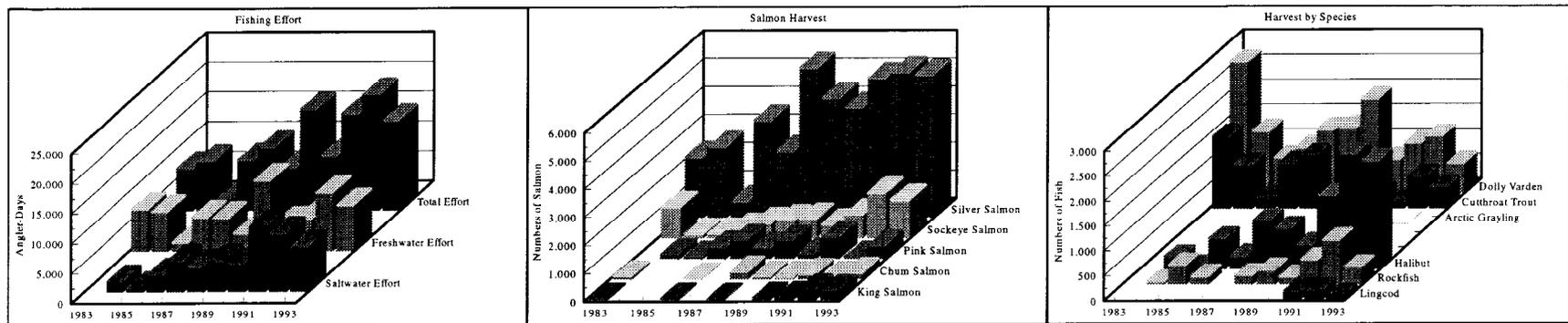


Figure 7.-Harvest and effort expended sport fishing in the Cordova area from 1983 through 1993

Table 8.-Harvest and effort expended sport fishing in the Whittier area from 1983 through 1993.

| YEAR | Freshwater Effort | Saltwater Effort | Total Effort | King Salmon | Silver Salmon | Pink Salmon | Sockeye Salmon | Chum Salmon | Dolly Varden | Lingcod | Rock Fish | Halibut |
|-----------|-------------------|------------------|--------------|-------------|---------------|-------------|----------------|-------------|--------------|---------|-----------|---------|
| 1983 | 1,416 | 6,103 | 7,519 | 0 | 294 | 2,413 | 932 | 31 | 293 | 0 | 1,112 | 284 |
| 1984 | 1,622 | 4,501 | 6,123 | 212 | 561 | 1,422 | 660 | 49 | 299 | 0 | 836 | 387 |
| 1985 | 1,196 | 9,868 | 11,064 | 22 | 1,725 | 1,975 | 759 | 228 | 69 | 0 | 1,974 | 826 |
| 1986 | 1,856 | 12,320 | 14,176 | 22 | 2,981 | 1,620 | 2,890 | 749 | 688 | 0 | 1,810 | 1,086 |
| 1987 | 3,194 | 11,834 | 15,028 | 321 | 2,262 | 2,699 | 1,884 | 359 | 1,593 | 0 | 1,971 | 650 |
| 1988 | 712 | 13,156 | 13,868 | 160 | 1,600 | 2,729 | 728 | 1,818 | 73 | 0 | 2,371 | 1,143 |
| 1989 | 823 | 9,325 | 10,148 | 199 | 1,238 | 1,681 | 1,172 | 257 | 388 | 0 | 2,374 | 912 |
| 1990 | 835 | 10,420 | 11,255 | 85 | 2,200 | 1,033 | 533 | 236 | 262 | 0 | 1,398 | 1,038 |
| 1991 | 255 | 13,391 | 13,646 | 59 | 2,799 | 1,647 | 444 | 229 | 40 | 274 | 2,497 | 1,484 |
| 1992 | 329 | 8,651 | 8,980 | 367 | 640 | 1,025 | 1,947 | 91 | 89 | 252 | 1,483 | 1,151 |
| 1993 | 341 | 16,576 | 16,917 | 353 | 1,558 | 775 | 1,152 | 686 | 213 | 150 | 2,158 | 1,705 |
| 1983-1992 | | | | | | | | | | | | |
| MEAN | 1,224 | 9,957 | 11,181 | 145 | 1,630 | 1,824 | 1,195 | 405 | 379 | 263 | 1,783 | 896 |
| % CHANGE | | | | | | | | | | | | |
| of 1993 | -72% | 66% | 51% | 144% | -4% | -58% | -4% | 70% | -44% | -43% | 21% | 90% |
| FROM MEAN | | | | | | | | | | | | |

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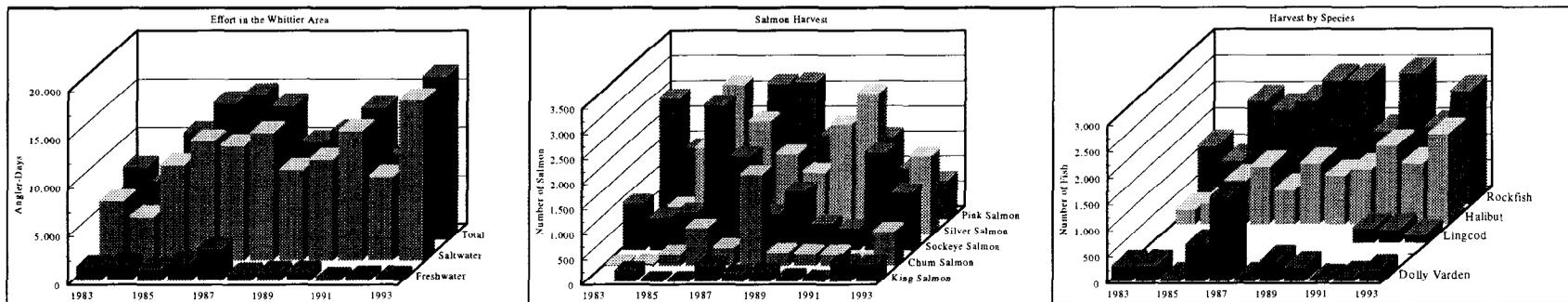


Figure 8.-Harvest and effort expended sport fishing in the Whittier area from 1983 through 1993.

Table 9.-Harvest and effort expended sport fishing in the Resurrection Bay area from 1983 through 1993.

| YEAR | Freshwater Effort | Saltwater Effort | Total Effort | King Salmon | Silver Salmon | Pink Salmon | Sockeye Salmon | Chum Salmon | Dolly Varden | Lingcod | Rockfish | Halibut | Eulachon |
|----------------------------------|-------------------|------------------|--------------|-------------|---------------|-------------|----------------|-------------|--------------|---------|----------|---------|----------|
| 1983 | 961 | 41,189 | 42,150 | 199 | 11,277 | 4,909 | 0 | 923 | 7,720 | 0 | 17,990 | 2,225 | 3,672 |
| 1984 | 302 | 46,376 | 46,678 | 24 | 10,014 | 11,747 | 1,372 | 2,644 | 1,908 | 0 | 22,882 | 3,242 | 9,980 |
| 1985 | 225 | 55,534 | 55,759 | 187 | 11,823 | 7,202 | 1,937 | 820 | 849 | 0 | 17,105 | 5,934 | 0 |
| 1986 | 321 | 55,051 | 55,372 | 226 | 14,502 | 11,014 | 337 | 1,958 | 1,071 | 0 | 38,660 | 10,398 | 730 |
| 1987 | 0 | 44,299 | 44,299 | 669 | 24,985 | 3,440 | 851 | 1,974 | 924 | 0 | 12,768 | 7,171 | 31 |
| 1988 | 1,091 | 51,938 | 53,029 | 2,056 | 17,626 | 2,001 | 418 | 3,947 | 728 | 0 | 35,688 | 11,696 | 93 |
| 1989 | 162 | 50,384 | 50,546 | 976 | 19,392 | 5,081 | 872 | 1,696 | 1,581 | 0 | 24,946 | 7,290 | 1,694 |
| 1990 | 254 | 71,927 | 72,181 | 1,004 | 29,912 | 6,261 | 486 | 427 | 301 | 0 | 18,729 | 9,500 | 3,752 |
| 1991 | 340 | 73,343 | 73,683 | 1,547 | 31,131 | 4,772 | 1,051 | 796 | 641 | 6,126 | 19,803 | 13,818 | 563 |
| 1992 | 409 | 83,159 | 83,568 | 2,934 | 28,356 | 4,313 | 1,201 | 1,321 | 597 | 8,081 | 28,729 | 18,595 | 3,753 |
| 1993 | 236 | 90,038 | 90,274 | 5,156 | 48,409 | 4,225 | 1,934 | 680 | 987 | 3,079 | 24,978 | 25,551 | 67 |
| 1983-1992 | | | | | | | | | | | | | |
| MEAN | 407 | 57,320 | 57,727 | 982 | 19,902 | 6,074 | 853 | 1,651 | 1,632 | 7,104 | 23,730 | 8,987 | 2,427 |
| % CHANGE of 1993 FROM MEAN | -42% | 57% | 56% | 425% | 143% | -30% | 127% | -59% | -40% | -57% | 5% | 184% | -97% |

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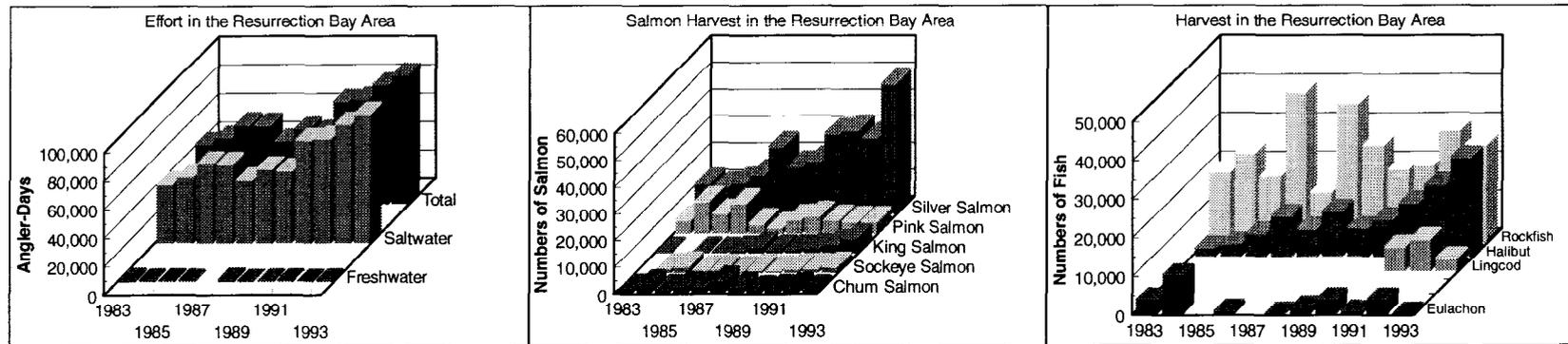


Figure 9.-Harvest and effort expended sport fishing in the Resurrection Bay area from 1983 through 1993.

Table 10.-Summary of coho salmon harvest by geographical regions in the Central Gulf Management Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 2,139 | 94 | 63 | 0 | 294 | 3,105 | 11,277 | 0 | 4,710 | 21,682 |
| 1984 | 274 | 2,506 | 212 | 0 | 0 | 561 | 1,535 | 10,014 | 137 | 5,138 | 20,377 |
| 1985 | 315 | 564 | 163 | 98 | 0 | 1,725 | 640 | 11,823 | 108 | 8,020 | 23,456 |
| 1986 | 657 | 3,440 | 336 | 397 | 31 | 2,981 | 1,269 | 14,502 | 76 | 6,911 | 30,600 |
| 1987 | 640 | 2,351 | 903 | 359 | 58 | 2,262 | 1,194 | 24,985 | 29 | 8,884 | 41,665 |
| 1988 | 419 | 5,311 | 382 | 618 | 0 | 1,600 | 637 | 17,626 | 54 | 10,241 | 36,888 |
| 1989 | 388 | 4,248 | 462 | 151 | 0 | 1,238 | 756 | 19,392 | 245 | 18,143 | 45,023 |
| 1990 | 779 | 3,900 | 197 | 456 | 35 | 2,200 | 295 | 29,912 | 147 | 18,630 | 56,551 |
| 1991 | 191 | 4,943 | 68 | 286 | 170 | 2,799 | 830 | 31,131 | 103 | 10,393 | 50,914 |
| 1992 | 129 | 5,150 | 170 | 410 | 219 | 640 | 752 | 28,356 | 209 | 17,580 | 53,615 |
| 1993 | 1,065 | 5,056 | 78 | 276 | 153 | 1,558 | 659 | 48,409 | 107 | 12,841 | 70,202 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 379 | 3,455 | 299 | 284 | 51 | 1,630 | 1,101 | 19,902 | 111 | 10,865 | 38,077 |
| % CHANGE of 1993 FROM MEAN | 181% | 46% | -74% | -3% | 198% | -4% | -40% | 143% | -3% | 18% | 84% |

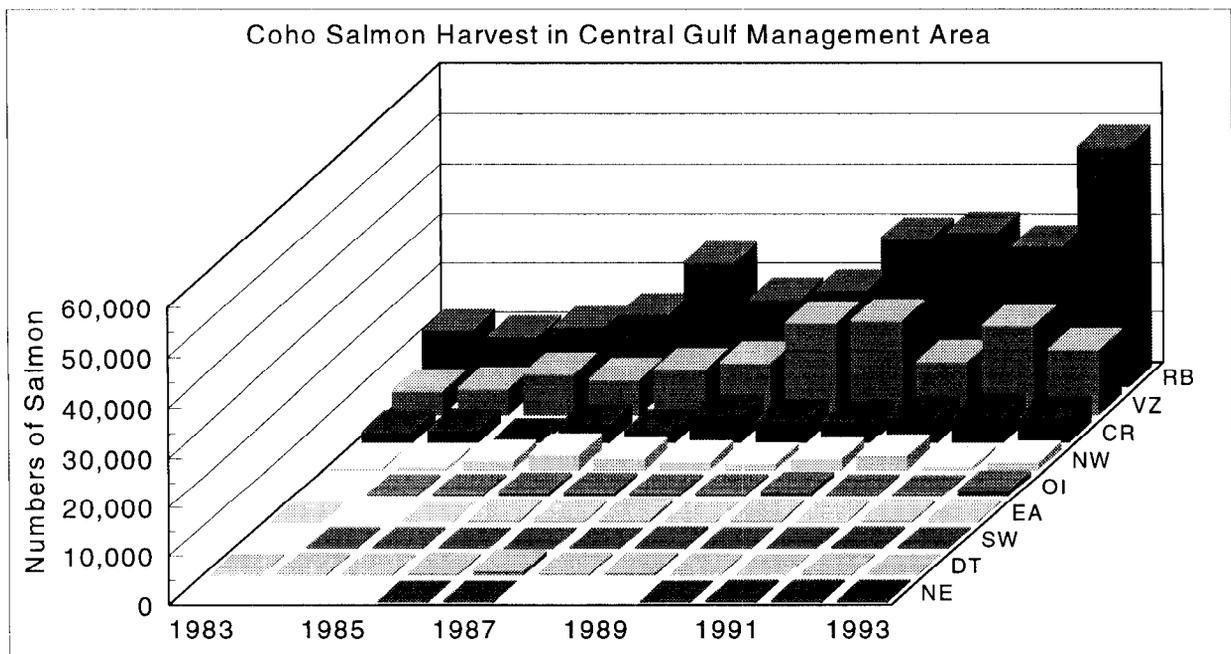


Figure 10.-Summary of coho salmon harvest by geographical regions in the Central Gulf Management Area, 1983-1993

Table 11.-Sport harvest of coho salmon in Resurrection Bay, 1983-1993.

| YEAR | Res Bay Freshwater ^a | Res Bay Saltwater Boat and Shore | Res Bay Saltwater Charter | Res Bay Total | CGMA Total |
|---------------------|------------------------------------|--|---------------------------------|------------------|---------------|
| 1983 | 0 | 11,277 | 0 | 11,277 | 21,682 |
| 1984 | 0 | 10,014 | 0 | 10,014 | 20,377 |
| 1985 | 87 | 11,736 | 0 | 11,823 | 23,456 |
| 1986 | 84 | 12,293 | 2,125 | 14,502 | 30,600 |
| 1987 | 0 | 22,776 | 2,209 | 24,985 | 41,665 |
| 1988 | 0 | 16,153 | 1,473 | 17,626 | 36,888 |
| 1989 | 48 | 16,455 | 2,889 | 19,392 | 45,023 |
| 1990 | 7 | 22,418 | 7,487 | 29,912 | 56,551 |
| 1991 | 88 | 23,700 | 7,343 | 31,131 | 50,914 |
| 1992 | 0 | 22,964 | 5,392 | 28,356 | 53,615 |
| 1993 | 210 | 35,266 | 12,933 | 48,409 | 70,202 |
| 1983-1992 | | | | | |
| MEAN | 31 | 16,979 | 2,892 | 19,902 | 38,077 |
| % CHANGE of 1993 | 569% | 108% | 347% | 143% | 84% |
| FROM MEAN | | | | | |

^a Illegal harvests

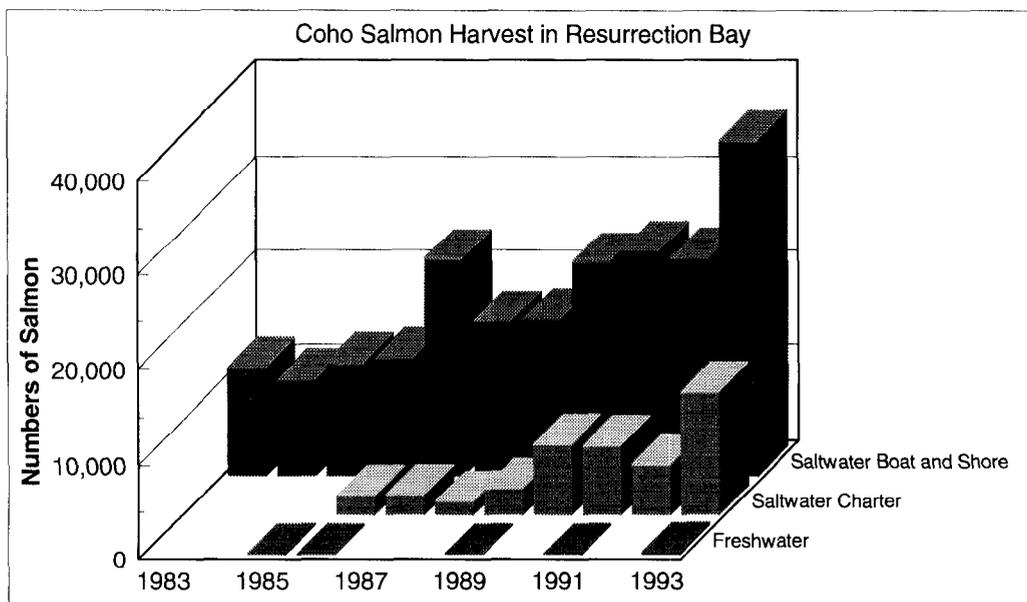


Figure 11.-Sport harvests of coho salmon in Resurrection Bay, 1983-1993.

salmon fisheries in Resurrection Bay in 1966 which gave the sport fishery the exclusive use of the Bay's coho salmon. In 1976, the Board modified the plan to stipulate that the commercial fishery for other salmon species be managed so that it does not interfere with the recreational fishery.

An ongoing enhancement program was initiated in 1964 in Bear Lake, which flows into Resurrection Bay, to supplement wild stock production of coho salmon. The enhancement program included stocking hatchery-reared coho fingerlings and eradicating major competitors. Initial results of the program resulted in increased smolt production (Vincent-Lang 1987). However, the lake gradually became reinfested with competitor species and the lake was again rehabilitated in 1971. Subsequently, survival of stocked fingerlings to smolt in some years has exceeded 50%. This, coupled with correspondingly high adult survival rates, has increased harvests in the recreational fishery. Recognizing the importance of the contribution of this enhancement program to the sport fishery, the Board of Fisheries adopted a management plan for Bear Lake in 1971. This plan stated that Bear Lake be managed primarily for the production of coho salmon and in accordance with this objective placed restrictions on the number of sockeye salmon that could be passed into Bear Lake.

In 1988, the Board revised the management plan for Bear Lake. The revised plan allowed for lifting the restrictions placed on the numbers of sockeye salmon which could be passed into the lake and allowed for the enhancement of sockeye salmon in Bear Lake. The purpose of this change in the management plan was to allow for the development of a commercial sockeye salmon fishery in Resurrection Bay. Bear Lake was considered to be the only viable location for such enhancement in the Resurrection Bay area. In making this change, however, the Board recognized the importance of Bear Lake in producing coho salmon for the recreational fishery and stipulated that (1) any enhancement of sockeye salmon must not cause a net loss of coho salmon smolt production from Bear Lake and (2) that any commercial fishery developed as a result of this enhancement effort must be prosecuted with minimal conflict with the recreational fishery. With this change, the Cook Inlet Aquaculture Association took over control of the Bear Lake weir and its operations in 1989, which had been operated by the Division of Sport Fish since the early 1960s.

Another component of the coho salmon enhancement in Resurrection Bay began in 1969 with annual plants of hatchery-reared smolts at a variety of local release sites. Although survival rates have varied between sites and years, smolt to adult survivals have been as high as 15%. The contribution of these fish to the sport fishery has also been significant, up to 51% (Vincent-Lang 1987; Vincent-Lang et al. 1988; Carlon and Vincent-Lang 1989, 1990).

The current bag and possession limits for salmon other than chinook salmon in Resurrection Bay are 6 fish per day and in possession. All freshwater drainages of Resurrection Bay are closed to salmon fishing.

Recent Fishery Performance

The sport harvest of coho salmon from Resurrection Bay waters during 1993 (48,409) was the highest ever recorded and was 143% above the historical mean harvest for the area since 1983 (Table 11 and Figure 11). This harvest accounted for just over 68% of the total coho salmon harvest from CGMA waters during 1993. As was the case in the past, private boat and shore

anglers accounted for the largest portion of the sport harvest (73%). The harvest by charter boat anglers is the most rapidly expanding component of the Resurrection Bay coho fishery.

Management Objective

For coho salmon smolt releases the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 9,000 coho salmon; (2) provide 18,000 angler-days of fishing opportunity annually; and (3) promote diverse sport fishing opportunity by providing coho salmon to both boat and shore-based anglers.

Cook Inlet Aquaculture Association is projecting a return of over 100,000 sockeye salmon to Bear Lake in 1994. This return is large enough to initiate a sockeye salmon fishery in Resurrection Bay and to provide fish for brood source for future Bear Lake releases and cost recovery for the stocking program. By regulation, any commercial fishery that occurs must be prosecuted with seine gear and all coho and chinook salmon caught incidentally must be released immediately. Also, this fishery must be prosecuted in a manner to minimize conflict with the recreational fishery.

No escapement goals have been established for coho salmon returns in Resurrection Bay. An escapement goal for sockeye salmon to Bear Lake is 1,000 fish.

No other specific fishery objectives have been formally established for Resurrection Bay coho salmon fisheries to date other than management objectives outlined in the Bear Lake and Resurrection Bay Management Plans. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various wild coho salmon stocks that occur within the CGMA while assuring for continued and, where possible, expanded opportunity to participate in hatchery-supported coho salmon fisheries in the area.

Recent Board of Fisheries Actions

There were no regulatory actions in this fishery during 1992. The next meeting for this area is scheduled for November of 1995.

During its 1992 meeting, the Board entertained several proposals regarding the management of Resurrection Bay commercial fisheries. These proposals centered on reintroducing gill net gear to the commercial fishery in anticipation of the sockeye salmon return from the Bear Lake enhancement effort. The Board failed to enact any changes to the current management plans for Bear Lake or Resurrection Bay.

During the 1992 meeting, the BOF voted against a proposal suggested by United Cook Inlet Drift Association to reinstitute drift gill nets into Resurrection Bay. There was very little discussion before the vote. All of the peninsula advisory committees voted against the proposal except Port Alexander.

Current Issues

The only major issue with this fishery is how the developing commercial fishery on sockeye salmon returning to Bear Lake will impact the recreational fishery. This issue will be addressed in the section entitled "Resurrection Bay Sockeye Salmon Fishery."

Ongoing Research and Management Activities

There are no other ongoing research and management activities to report for this fishery.

Recommended Research and Management Activities

No research activities for this fishery are recommended at present.

Resurrection Bay Chinook Salmon Fishery

Resurrection Bay does not support any natural (wild) returns of chinook salmon that can sustain directed sport harvest. Thus the sport fishery for chinook salmon in and near Resurrection Bay is supported primarily by hatchery produced fish with a limited harvest of feeder chinook salmon. Chinook salmon smolt with early run timing (May and June) have been stocked in the marine waters adjacent to Lowell Creek and in Seward Lagoon since 1984. These releases have averaged approximately 225,000 smolts since 1988 (Table 5). Starting in 1991, chinook salmon smolt with late-run timing (July) were also stocked in Seward. These releases were intended to diversify and extend fishing opportunities in Resurrection Bay.

The marine waters of Resurrection Bay are open to the taking of chinook salmon throughout the year. The bag and possession limit for chinook salmon in marine waters is 2 fish per day and 2 fish in possession. All freshwater drainages of Resurrection Bay are closed to salmon fishing.

From 1983-1993, the mean harvest of chinook salmon from marine waters of Resurrection Bay has been 1,362 fish, accounting for 66% of the historical mean harvest of chinook salmon in CGMA over this period (Table 12 and Figure 12).

Recent Fishery Performance

The sport harvest of chinook salmon in Resurrection Bay during 1993 (5,156) was 425% above the historical mean harvest for the area since 1983 (Table 13 and Figure 13). Anglers fishing from the shoreline accounted for the largest proportion of the harvest followed by the private boat anglers. Of all angler groups, those fishing from shore showed the largest increase during 1993. The chinook harvest from shore anglers increased 586% from the historical mean and was the largest recorded harvest to date. The harvest (2,001) of chinook salmon from private boat anglers also increased significantly from 1992 to 1993 and was a record high harvest.

Harvest and catch figures are not yet available for the 1994 fishery, but it is anticipated that the harvest will be at or above historic levels for this area.

Management Objective

For hatchery produced early-run chinook salmon, the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 6,000 early-run chinook salmon; (2) provide 9,000 angler-days of early-run chinook salmon fishing opportunity annually; and (3) promote diverse sport fishing opportunity by providing early-run chinook salmon to both boat and shore-based anglers.

For hatchery produced late-run chinook salmon the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 3,000 late-run chinook salmon; (2) provide 9,000 angler-days of late-run chinook salmon fishing opportunity annually; and (3) promote diverse sport fishing opportunity by providing late-run chinook salmon to both boat and shore-based anglers.

Recent Board of Fisheries Actions

There were no Board actions for this fishery in 1990 or 1992.

Table 12.-Summary of chinook salmon harvest by geographical regions in the Central Gulf Management Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 21 | 0 | 0 | 0 | 0 | 314 | 199 | 0 | 241 | 775 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 212 | 74 | 24 | 0 | 125 | 435 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 187 | 0 | 326 | 535 |
| 1986 | 0 | 11 | 0 | 234 | 0 | 22 | 67 | 226 | 0 | 168 | 728 |
| 1987 | 0 | 0 | 0 | 165 | 0 | 321 | 19 | 669 | 0 | 360 | 1,534 |
| 1988 | 0 | 9 | 0 | 0 | 0 | 160 | 38 | 2,056 | 9 | 227 | 2,499 |
| 1989 | 210 | 0 | 0 | 0 | 0 | 199 | 41 | 976 | 117 | 526 | 2,069 |
| 1990 | 56 | 34 | 0 | 23 | 0 | 85 | 0 | 1,004 | 0 | 220 | 1,422 |
| 1991 | 0 | 59 | 0 | 0 | 0 | 59 | 0 | 1,547 | 6 | 353 | 2,024 |
| 1992 | 47 | 321 | 0 | 0 | 0 | 367 | 41 | 2,934 | 23 | 317 | 4,050 |
| 1993 | 47 | 302 | 47 | 18 | 9 | 353 | 163 | 5,156 | 0 | 405 | 6,500 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 31 | 46 | 0 | 42 | 0 | 145 | 59 | 982 | 16 | 286 | 1,607 |
| % CHANGE of 1993 FROM MEAN | 50% | 564% | | -57% | | 144% | 174% | 425% | -100% | 41% | 304% |

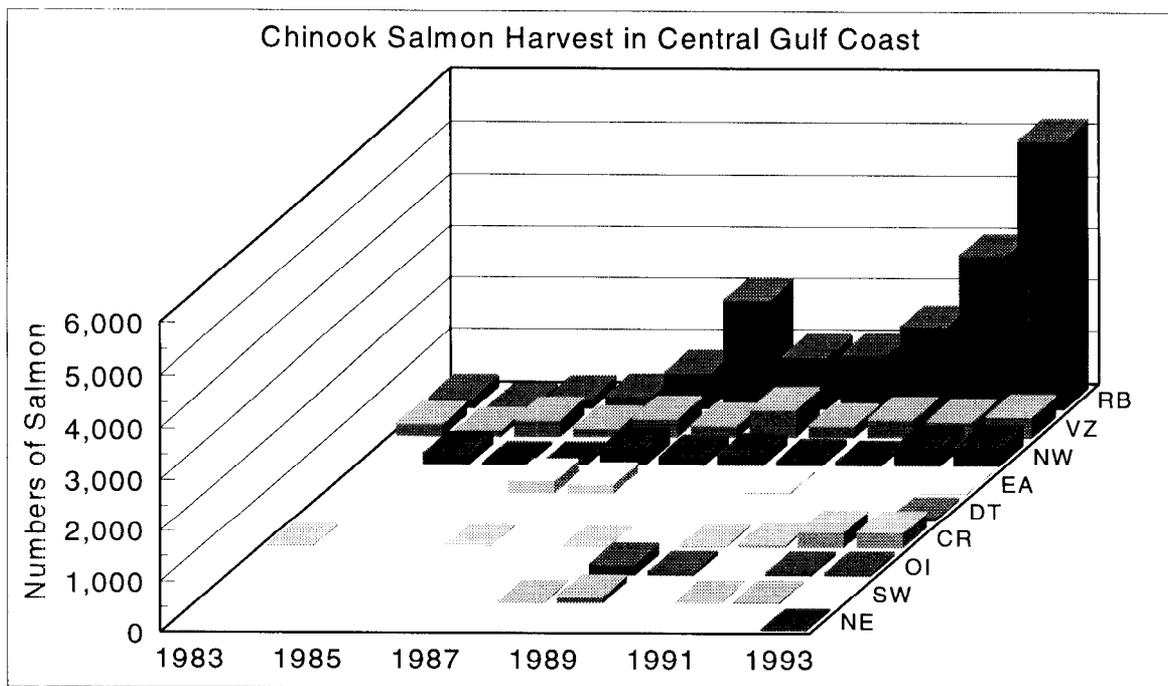


Figure 12.-Summary of chinook salmon harvest by geographical regions in the Central Gulf Management Area, 1983-1993.

Table 13.-Sport harvests of chinook salmon in Resurrection Bay, 1983-1993.

| YEAR | Freshwater | Saltwater Boat | Saltwater Shore | Saltwater Boat and Shore | Saltwater Charter | Grand Total |
|----------------------------------|------------|----------------|-----------------|--------------------------|-------------------|-------------|
| 1983 | 0 | 199 | 0 | 199 | 0 | 199 |
| 1984 | 0 | 24 | 0 | 24 | 0 | 24 |
| 1985 | 0 | 187 | 0 | 187 | 0 | 187 |
| 1986 | 0 | 129 | 97 | 213 | 13 | 226 |
| 1987 | 0 | 344 | 325 | 452 | 217 | 669 |
| 1988 | 0 | 891 | 1,165 | 1,820 | 236 | 2,056 |
| 1989 | 0 | 518 | 458 | 829 | 147 | 976 |
| 1990 | 0 | 594 | 410 | 942 | 62 | 1,004 |
| 1991 | 0 | 778 | 769 | 1,189 | 358 | 1,547 |
| 1992 | 0 | 1,557 | 1,377 | 2,605 | 329 | 2,934 |
| 1993 | 0 | 2,001 | 3,155 | 4,464 | 692 | 5,156 |
| 1983-1992 | | | | | | |
| MEAN | | 522 | 460 | 846 | 136 | 982 |
| % CHANGE of 1993 FROM MEAN | | 283% | 586% | 428% | 408% | 425% |

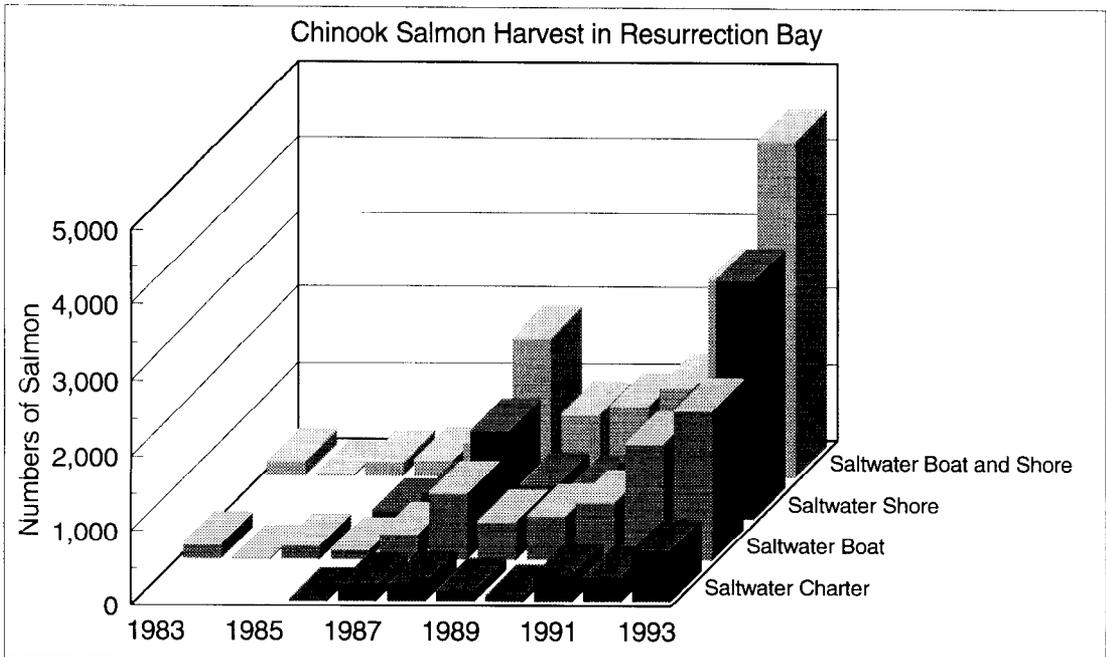


Figure 13.-Sport harvests of chinook salmon in Resurrection Bay, 1983-1993.

Current Issues

In order to meet the objectives stated above (participation and diversity for both shore and boat anglers), it will be necessary to continue to work with local charter operators and private boat owners to establish a troll fishery on returning adult chinook salmon. A troll fishery would distribute the effort and catch between angler groups. At the present time, the majority of the catch comes from shoreline anglers although the percent of harvest from private boats increased significantly in 1993. It is expected as anglers become more familiar with this resource and the numbers of returning adult chinook increase, that a troll fishery will continue to develop.

Ongoing Research and Management Activities

There are no ongoing research or management activities for this fishery.

Recommended Research and Management Activities

No new research activities or regulation changes for this fishery are recommended at present.

Resurrection Bay Pink Salmon Fishery

The Resurrection Bay pink salmon fishery is supported by wild stocks that spawn in five streams at the head of the bay. Pink salmon return to Resurrection Bay mid-July through late August with the peak of the return occurring in late July.

The sport fishing season is open all year and the bag and possession limit is 6 salmon other than chinook per day and 6 in possession.

The average harvest of pink salmon in Resurrection Bay has been 6,074 fish from 1983 through 1992 which accounted for an average of 16% of the total CGMA pink salmon harvest over this period (Table 14 and Figure 14).

Recent Fishery Performance

The sport harvest of pink salmon from Resurrection Bay during 1993 (4,225) was 30% below the historical mean harvest for the area (Table 14 and Figure 14). This harvest accounted for 11% of the total pink salmon harvest from CGMA waters during 1993. Private boat anglers harvested the largest proportion of the total harvest, followed by shoreline anglers and charter boat anglers (Table 15 and Figure 15).

Harvest and catch figures are not yet available for the 1994 fishery, but it is anticipated that the harvest will be at or above historic levels for this area.

Management Objective

No specific fishery objectives have been formally established for Resurrection Bay pink salmon fisheries to date. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various pink salmon stocks that occur within the area while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting these stocks.

Recent Board of Fisheries Actions

There were no Board actions regarding this fishery in 1990 or 1992.

Current Issues

There are currently no issues regarding this fishery.

Table 14.-Summary of pink salmon harvest by geographical regions in Central Gulf Management Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 0 | 0 | 0 | 0 | 2,413 | 3,430 | 4,909 | 157 | 8,696 | 19,605 |
| 1984 | 424 | 149 | 0 | 0 | 0 | 1,422 | 2,169 | 11,747 | 499 | 9,825 | 26,235 |
| 1985 | 108 | 55 | 0 | 54 | 65 | 1,975 | 1,768 | 7,202 | 195 | 28,450 | 39,872 |
| 1986 | 91 | 412 | 92 | 443 | 0 | 1,620 | 153 | 11,014 | 291 | 22,170 | 36,286 |
| 1987 | 87 | 641 | 117 | 19 | 146 | 2,699 | 369 | 3,440 | 233 | 27,071 | 34,822 |
| 1988 | 36 | 364 | 0 | 36 | 0 | 2,729 | 783 | 2,001 | 746 | 26,776 | 33,471 |
| 1989 | 69 | 627 | 155 | 498 | 454 | 1,681 | 626 | 5,081 | 962 | 32,922 | 43,075 |
| 1990 | 232 | 162 | 12 | 0 | 221 | 1,033 | 186 | 6,261 | 570 | 46,730 | 55,407 |
| 1991 | 27 | 747 | 9 | 324 | 288 | 1,647 | 459 | 4,772 | 171 | 48,618 | 57,062 |
| 1992 | 9 | 37 | 9 | 18 | 540 | 1,025 | 1,575 | 4,313 | 202 | 28,596 | 36,324 |
| 1993 | 26 | 433 | 29 | 220 | 0 | 775 | 1,582 | 4,225 | 191 | 32,479 | 39,960 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 108 | 319 | 39 | 139 | 171 | 1,824 | 1,152 | 6,074 | 403 | 27,985 | 38,216 |
| % CHANGE of 1993 FROM MEAN | -76% | 36% | -26% | 58% | -100% | -58% | 37% | -30% | -53% | 16% | 5% |

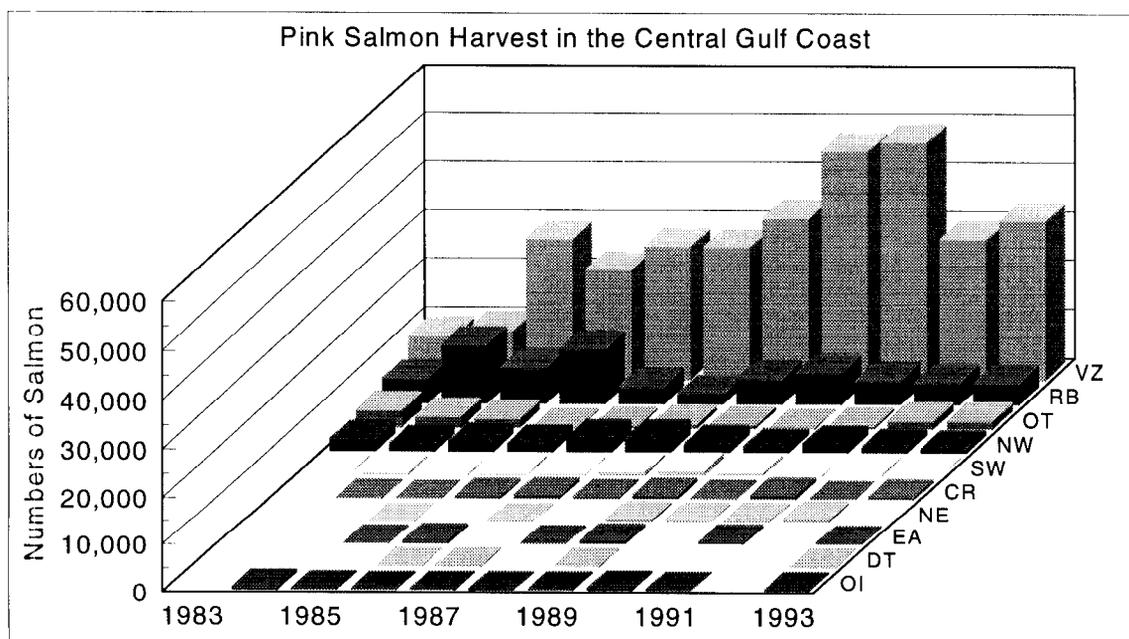


Figure 14.-Summary of pink salmon harvest by geographical regions in Central Gulf Management Area, 1983-1993.

Table 15.-Sport harvests of pink salmon in Resurrection Bay, 1983-1993.

| YEAR | Freshwater | Saltwater Boat | Saltwater Shore | Saltwater (B+S) Private | Saltwater Charter | Grand Total |
|---------------------|------------|----------------|-----------------|-------------------------|-------------------|-------------|
| 1983 | 0 | 4,909 | 0 | 4,909 | 0 | 4,909 |
| 1984 | 150 | 11,510 | 87 | 11,597 | 0 | 11,747 |
| 1985 | 0 | 5,262 | 1,940 | 7,202 | 0 | 7,202 |
| 1986 | 0 | 4,449 | 6,559 | 8,470 | 2,538 | 11,014 |
| 1987 | 0 | 1,974 | 1,466 | 1,937 | 1,503 | 3,440 |
| 1988 | 0 | 1,601 | 400 | 1,655 | 346 | 2,001 |
| 1989 | 0 | 1,659 | 3,422 | 4,524 | 557 | 5,081 |
| 1990 | 0 | 4,170 | 2,091 | 5,234 | 1,027 | 6,261 |
| 1991 | 0 | 2,745 | 2,027 | 3,615 | 1,157 | 4,772 |
| 1992 | 0 | 2,408 | 1,905 | 3,389 | 924 | 4,313 |
| 1993 | 0 | 2,741 | 1,484 | 3,359 | 866 | 4,225 |
| 1983-1992 | | | | | | |
| MEAN | | 4,069 | 1,990 | 5,253 | 805 | 6,074 |
| % CHANGE of 1993 | | -33% | -25% | -36% | 8% | -30% |
| FROM MEAN | | | | | | |

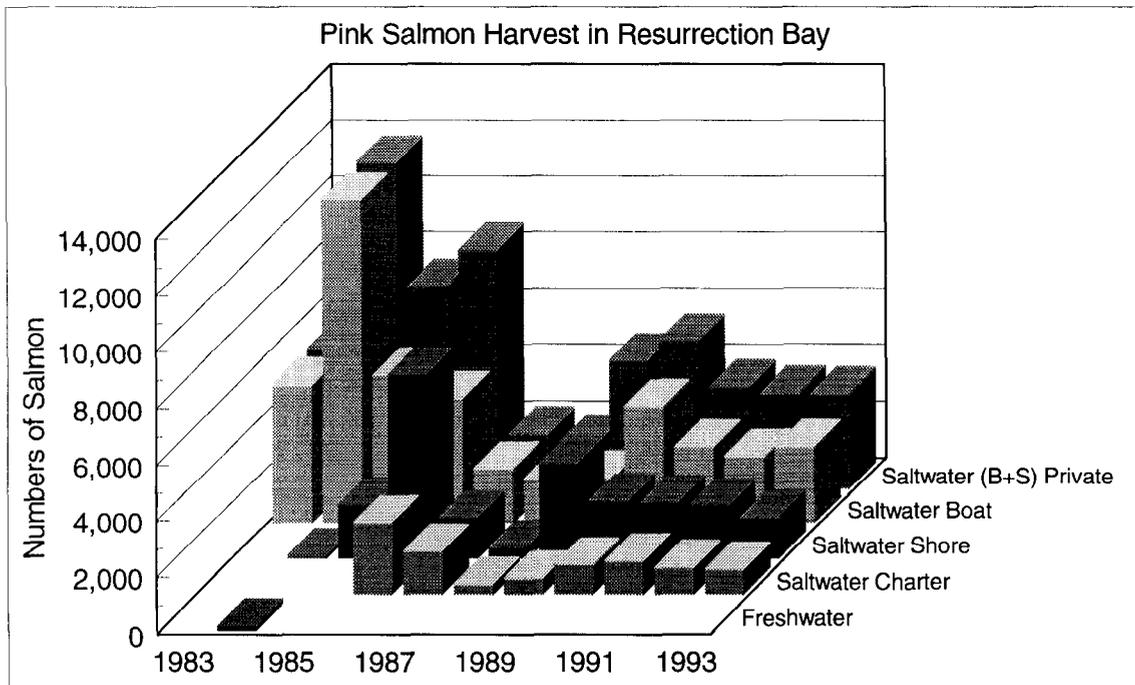


Figure 15.-Sport harvests of pink salmon in Resurrection Bay, 1983-1993.

Ongoing Research and Management Activities

The Division of Sport Fish does not conduct any research on pink salmon stocks in Resurrection Bay but the Division of Commercial Fisheries conducts aerial escapement surveys of pink salmon in the lower Cook Inlet area including Resurrection Bay.

Recommended Research and Management Activities

No additional research or management activities are recommended for this fishery at present. At this time, no changes in regulation are recommended with respect to this fishery.

Resurrection Bay Sockeye Salmon Fishery

Sockeye salmon return to Resurrection Bay streams from June through July with peak immigration varying by stream. Spawning occurs in mid-July through September.

Current limits governing the sport fishery for salmon other than chinook in marine waters are 6 per day and in possession. Salmon fishing in Resurrection Bay drainages is closed.

Resurrection Bay has historically been managed primarily for the recreational coho fishery and the sport harvest of sockeye salmon has been incidental and has targeted Bear Lake sockeye stocks. The Board of Fisheries developed a management plan for the salmon fisheries in Resurrection Bay in 1966 which gave the sport fishery the exclusive use of the Bay's coho salmon. In 1976 the Board modified the plan to stipulate that the commercial fishery for other salmon species be managed so that it does not interfere with the recreational fishery. After a successful coho salmon enhancement program was established in Bear Lake, the Board of Fisheries adopted a management plan for Bear Lake in 1971. This plan stated that Bear Lake be managed primarily for the production of coho salmon and in accordance with this objective placed restrictions on the number of sockeye salmon entering Bear Lake.

Bear Lake is considered the only viable candidate for sockeye salmon enhancement in Resurrection Bay. The Board adopted a new management plan for Bear Lake in 1988. This plan rescinded the restrictions on the escapement of sockeye salmon to Bear Lake. Sockeye salmon dip net fisheries were no longer permitted in Bear Creek. The plan further directed the department to establish a sockeye salmon escapement goal for Bear Lake. The plan also stipulated that if enhancement of sockeye salmon occurs, the early run timing of the native stock is to be maintained. The Board further specified that enhancement should not cause a net loss of coho smolt production from Bear Lake. Should enhancement of sockeye salmon create a viable commercial fishery, it was the Board's intent that this fishery be conducted "with minimal conflict with the sport fishery." This plan was a major departure from previous policy in that Bear Lake is now managed for both coho and sockeye salmon production.

In the spring of 1990, 2.24 million early-run sockeye salmon fry of Big River origin were released into Bear Lake. In addition, 158,000 age-0 smolt of Russian River early-run origin were released at the Bear Lake Fish Facility (Table 5). These smolt contributed to the first sockeye salmon returns in 1992. The first significant return from the 1990 fry release will occur in 1994 when fish return as 2-ocean adults.

From 1983 through 1992, the average harvest of sockeye salmon from Resurrection Bay has been 853 accounting for an average of 15% of the total CGMA sockeye salmon harvest over this

period. Just over 60% of this harvest has been from private boat anglers (Table 16 and Figure 16). Shore anglers account for 37% of the harvest and the remaining 3% are harvested by chartered anglers.

Recent Fishery Performance

The sport harvest of sockeye salmon from Resurrection Bay during 1993 (1,934) was only four fish less than the highest on record, being 127% above the historical mean harvest for the area since 1983 (Table 16 and Figure 16). This harvest accounted for 27% of the total sockeye salmon harvest from CGMA waters during 1993. The 1993 harvest (1,383) for the private boat anglers represents a 164% increase from the historical mean harvest from 1983 through 1992.

The 1994 harvest and catch estimates are not yet available for the sockeye salmon fishery in Resurrection Bay but they are expected to be similar to 1990 levels since it appears that the returns from the fry and smolt releases have had poor survival to date.

Management Objective

A biological escapement goal of 1,000 sockeye salmon has been established for Bear Lake. No other specific fishery objectives have been formally established for Resurrection Bay sockeye salmon fisheries to date other than management objectives outlined in the Bear Lake and Resurrection Bay Management Plans. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the wild sockeye salmon stocks that occur within the CGMA while assuring for continued and, where possible, expanded opportunity to participate in hatchery-supported sockeye salmon fisheries in the area.

Recent Board of Fisheries Actions

No specific actions were taken by the Board with respect to this fishery during its 1992 meetings.

During its 1992 meeting, the Board entertained a proposal regarding the management of Resurrection Bay commercial fisheries. The proposal centered on reintroducing gill net gear to the commercial fishery in anticipation of the sockeye salmon return from the Bear Lake enhancement effort. The Board did not pass this proposal and did not want to enact any changes to the current management plans for Bear Lake or Resurrection Bay.

Current Issues

In anticipation of an enhanced sockeye salmon return to Bear Lake in 1992, the Division of Commercial Fisheries and the Cook Inlet Seiners Association jointly developed a management plan that will attempt to provide for adequate escapement while still allowing for an orderly commercial harvest of surplus fish. The plan calls for the commercial fishery to operate on the capes outside of Resurrection Bay to minimize the impact on the recreational fishery. There is no information available on the likely entry pattern for sockeye salmon returning to Bear Lake and staff have concerns about creating a mixed-stock fishery on the capes. The Lower Cook Inlet Seine Fishery Management Plan stipulates that all seine fisheries conducted in Lower Cook Inlet be managed so that their efforts are directed primarily on Lower Cook Inlet stocks. If a significant mixed-stock fishery on other stocks develops as a result of this interim management, the cape fishery can be closed under this plan.

Ongoing Research and Management Activities

No specific research or management activities are directed at this fishery by Division of Sport Fish.

Table 16.-Sport harvests of sockeye salmon in Resurrection Bay, 1983-1993.

| YEAR | Freshwater | Saltwater Boat | Saltwater Shore | Saltwater (B+S) Private | Saltwater Charter | Grand Total |
|----------------------------|------------|----------------|-----------------|-------------------------|-------------------|-------------|
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 67 | 1,305 | 0 | 1,305 | 0 | 1,372 |
| 1985 | 0 | 1,335 | 602 | 1,937 | 0 | 1,937 |
| 1986 | 0 | 123 | 214 | 306 | 31 | 337 |
| 1987 | 0 | 308 | 543 | 760 | 91 | 851 |
| 1988 | 0 | 254 | 164 | 400 | 18 | 418 |
| 1989 | 0 | 367 | 505 | 744 | 128 | 872 |
| 1990 | 0 | 398 | 88 | 418 | 68 | 486 |
| 1991 | 51 | 464 | 536 | 744 | 256 | 1,051 |
| 1992 | 0 | 675 | 526 | 1,143 | 58 | 1,201 |
| 1993 | 39 | 1,383 | 512 | 1,679 | 216 | 1,934 |
| 1983-1992 | | | | | | |
| MEAN | 12 | 523 | 318 | 776 | 65 | 853 |
| % CHANGE of 1993 FROM MEAN | 231% | 164% | 61% | 116% | 232% | 127% |

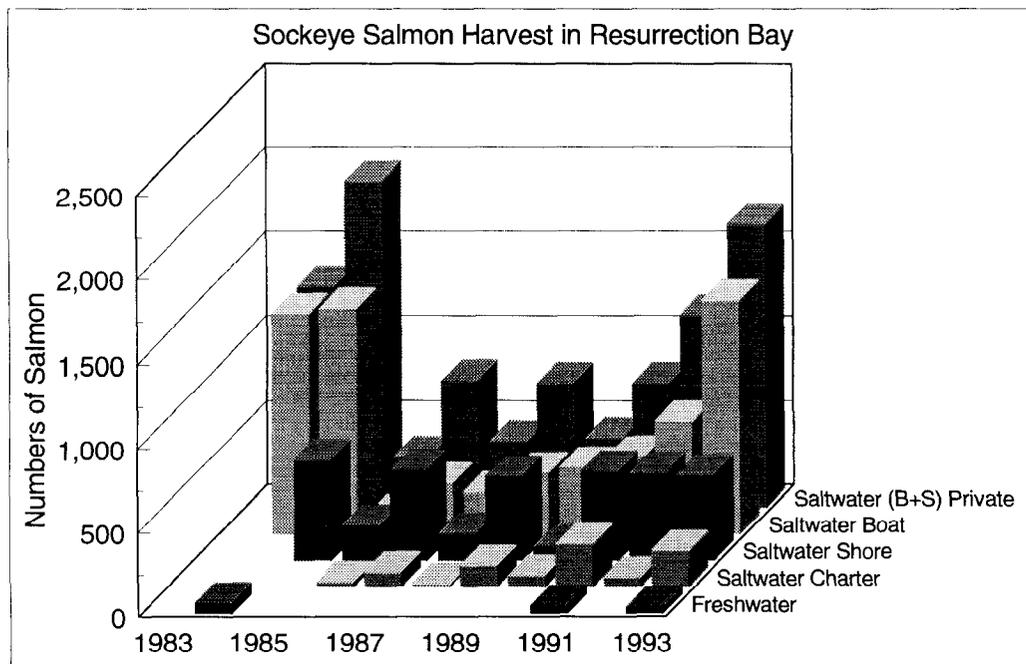


Figure 16.-Sport harvests of sockeye salmon in Resurrection Bay, 1983-1993.

Recommended Research and Management Activities

It is imperative that a department approved coded wire tagging and recovery program be conducted for the Bear Lake sockeye salmon program. This program will provide data on fishery contribution, timing, and success of the smolt and fry releases of sockeye salmon from Bear Lake.

PRINCE WILLIAM SOUND FISHERIES

Prince William Sound Coho Salmon Fishery

The coho salmon fisheries in PWS are supported by both wild and hatchery fish, although the majority of the harvest is hatchery fish. Coho salmon smolt have been stocked at Valdez, Cordova, and Whittier and returns from these stocking efforts have established major sport fisheries at all three locations.

Wild and stocked coho salmon return to PWS streams from mid-August through October. Peak immigration typically occurs during mid-September and spawning occurs in streams beginning in October.

The majority of PWS is open to the taking of coho salmon year round. The bag and possession limit for coho in marine waters is 6 fish per day and 12 fish in possession and 3 fish per day and in possession in fresh water. There are some waters that are not open to coho salmon fishing. These waters include Eccles Creek, Eyak Lake, and Hartney Creek (all near Cordova), and all freshwater drainages of Valdez Arm except for Robe River and Solomon Gulch Creek.

From 1983-1992, the mean harvest of coho salmon from PWS has been 18,175 accounting for 48% of the historical mean harvest of coho salmon in the CGMA during this period (Table 10 and Figure 10). Nearly 60% of this harvest has been from Valdez Arm (Table 10 and Figure 10). Since 1988, the majority of the harvest of coho salmon in Valdez Arm is from fish produced by the nonprofit Valdez Fisheries Development Association (VFDA) hatchery located on Solomon Gulch Creek. Coho sport fishing in Port Valdez takes place from boats and the shoreline since by regulation most of the freshwater drainages of Port Valdez are closed to fishing for salmon.

The Cordova road system is another popular coho fishery in PWS. Anglers fishing this area have accounted for 19% of the PWS historical mean harvest from 1983-1993 (Tables 10 and 17, Figure 17). As in Port Valdez, the sport harvest of coho salmon is comprised of both wild and hatchery fish. The wild stock component of the harvest takes place on the clearwater tributaries accessible from the Copper River Highway between Eyak River and the Million Dollar Bridge. Eyak River is the most popular fishing location for coho salmon along the Cordova road system and has accounted for 44% of the historical mean harvest (Table 17 and Figure 17). The next largest coho salmon fishery targets hatchery coho salmon returning to Fleming Spit in Orca Inlet, located near downtown Cordova. Anglers harvested an average of approximately 1,080 coho, between 1983-1992, from waters adjacent to Fleming Spit. Another popular coho fishery occurs along the highway in the clearwater streams entering Alaganik Slough.

The Whittier area sport fishery for coho salmon depends entirely on returning hatchery fish. The coho salmon smolt release program has produced annual returns that have ranged from approximately 50 to 4,000 adult coho. Since the adult returns have been highly variable, the sport harvest has also fluctuated. The harvest has ranged from 294 to 2,981 coho salmon from

Table 17.-Summary of coho salmon harvest in the Cordova area of Prince William Sound, 1983-1993.

| YEAR | Alaganik Slough | Clear Creek | Eyak Drainage ^a | Orca Inlet | Other Sites | Grand Total |
|-----------|-----------------|-------------|----------------------------|------------|-------------|-------------|
| 1983 | 566 | 0 | 1,017 | 0 | 556 | 2,139 |
| 1984 | 673 | 0 | 1,284 | 50 | 499 | 2,506 |
| 1985 | 217 | 0 | 239 | 108 | 0 | 564 |
| 1986 | 46 | 0 | 2,767 | 474 | 153 | 3,440 |
| 1987 | 311 | 0 | 680 | 1,166 | 194 | 2,351 |
| 1988 | 2,183 | 0 | 1,201 | 1,691 | 236 | 5,311 |
| 1989 | 908 | 76 | 2,100 | 1,060 | 104 | 4,248 |
| 1990 | 316 | 70 | 1,462 | 1,883 | 169 | 3,900 |
| 1991 | 306 | 211 | 1,355 | 2,989 | 82 | 4,943 |
| 1992 | 729 | 16 | 2,996 | 1,377 | 32 | 5,150 |
| 1993 | 1,127 | 332 | 2,431 | 721 | 445 | 5,056 |
| 1983-1992 | | | | | | |
| MEAN | 626 | 37 | 1,510 | 1,080 | 203 | 3,455 |
| % CHANGE | | | | | | |
| of 1993 | 80% | 790% | 61% | -33% | 120% | 46% |
| FROM MEAN | | | | | | |

^a Eyak Drainage includes Eyak River, Eyak Lake and Power Creek.

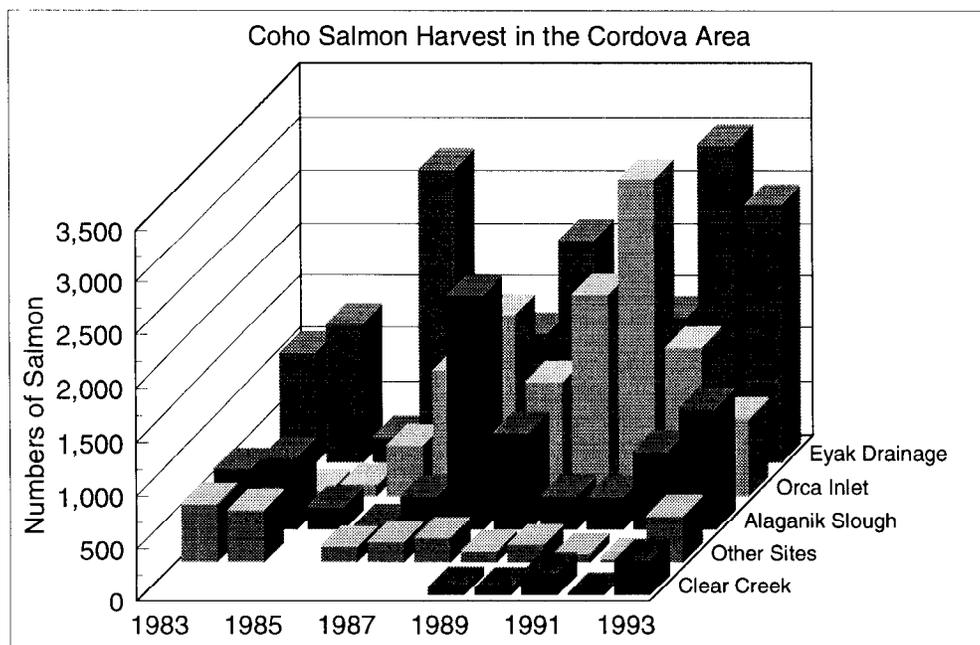


Figure 17.-Summary of coho salmon harvest in the Cordova area of Prince William Sound, 1983-1993.

1983-1993 (see NW PWS, Table 10 and Figure 10). This fishery takes place in and around the Whittier boat harbor, near the mouths of Shakespeare and Cove creeks. Both shoreline and boat anglers participate in this fishery.

The remainder of the PWS harvest of coho salmon comes from sites other than the three major ports (Table 10 and Figure 10). These fisheries occur primarily on wild stocks of coho salmon throughout the non-road-accessible areas of PWS, although there is a growing fishery that targets coho returning to PWSAC's Wally Noerenberg Hatchery located at the southern end of Esther Island.

Recent Fishery Performance

The sport harvest of coho salmon from PWS waters during 1993 was 21,793. This harvest accounted for just over 31% of the total coho salmon harvest from CGMA waters during 1993, a figure that is similar to the average contribution of this area since 1983. As was the case in the past, Valdez Arm supported the largest harvest of coho salmon in PWS, followed by fisheries in the Cordova road system (Table 10 and Figure 10).

Although harvest and catch figures are not yet available for 1994, it is anticipated that the harvest will be above historic levels for this area.

Management Objective

The stocking of coho salmon in PWS is accomplished entirely by PNP hatcheries, therefore the following specific management goals are stated as ideals for these stocking programs. For hatchery produced coho salmon stocked at Whittier and Cordova (Orca Inlet) the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 5,000 coho salmon at each location; (2) provide 10,000 angler-days of fishing opportunity annually at each location; and (3) promote diverse sport fishing opportunity by providing coho salmon to both boat and shore-based anglers. For hatchery produced coho salmon stocked at Valdez, the management objectives are to: (1) produce, through supplemental hatchery production, an annual return of 25,000 coho salmon; (2) provide 50,000 angler-days of fishing opportunity annually; and (3) promote diverse sport fishing opportunity by providing coho salmon to both boat and shore-based anglers.

For the wild stocks of coho salmon on the Copper River Delta, the management objective is to meet the minimum escapement guidelines while providing for at least 4,000 angler-days of effort annually. The biological escapement goal for the Copper River delta is 53,800 coho salmon.

No specific fishery objectives for the remaining coho salmon fisheries in PWS have been established to date. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various wild coho salmon stocks that occur within PWS while assuring for continued and, where possible, expanded opportunity to participate in area-wide coho salmon fisheries.

Recent Board of Fisheries Actions

In 1990, the Board opened Solomon Gulch Creek, adjacent to the VFDA Hatchery, to sport fishing for salmon 300 feet downstream of the VFDA weir. Additionally, the Board established a "traditional fly-fishing-only-area" on Eyak River in response to concerns voiced by the Copper River/Prince William Sound Advisory Committee. The committee felt that anglers were snagging fish in Eyak River and gear restrictions were necessary to reduce this practice.

Current Issues

One issue that has been of concern in recent years is over the developing sport fishery along the Copper River Delta. This issue is being resolved as a result of community and departmental response to these concerns, however, this issue should continue to be monitored. In 1992, a large number of locals and the Commissioner of Fish and Game expressed concern at the large numbers of boats participating in the sport fishery near the mouth of Eyak River and bank anglers along the various streams along the Delta. The common concern was that these targeted sport fisheries were efficient enough that there would not be sufficient escapement to meet the minimum escapement guidelines. These concerns were further exacerbated by anglers participating in a coho derby sponsored by the Chamber of Commerce. The original intent of the derby was to target on the hatchery produced coho salmon returning to Fleming Spit, but since the returns to Fleming Spit were poor, anglers directed their effort on the wild stocks along the Delta. In 1994 the derby rules were changed to eliminate fish size as a winning category. Fish were tagged and released only at Fleming Spit, thus, catch and release fishing targeting large fish in the Eyak River was eliminated. The Chamber was commended for initiating this change for conservation reasons. The returns to Fleming Spit have improved since 1992, and the escapement into the Eyak River in 1994 was excellent.

The department does not feel there are any major conservation concerns with the Copper River Delta coho stocks. Staff believe the necessary tools to manage these fisheries, including both sport and commercial, on a sustained yield basis exists. Biweekly escapement surveys and commercial fishery openings provide data necessary to manage these fisheries. If any of the streams are not meeting the minimum escapement guidelines, the department can respond with an emergency order as was issued in 1992. The streams along the Copper River Delta were reopened to sport fishing for salmon in 1988 after being closed for conservation concerns in the early 1970s.

This division measures the success of its programs in part by the level of participation in each fishery. In particular, the expanding sport fishery in Eyak River is not viewed as detrimental provided escapement guidelines are met. Proposals to unduly restrict these fisheries will be viewed by the department as allocative in nature.

Another concern that appears to be developing is the increased pressure on the small coho stocks returning to the shorter coastal streams on Hawkins Island and along the shores of Orca Bay and Orca Inlet. An increase in "floating lodges" and charter activity has increased pressure on these streams.

Ongoing Research and Management Activities

Division of Commercial Fisheries Management and Development currently conducts escapement surveys of the clearwater streams adjacent to the Copper River Highway.

Recommended Research and Management Activities

Increased monitoring of the Orca Bay and Orca Inlet coho fisheries should be implemented and monitoring of road system fisheries should continue. Directed angler effort studies should be conducted in both of these areas in 1996 in preparation for the February 1997 Board of Fisheries meeting.

Prince William Sound Chinook Salmon Fishery

There is limited wild production of chinook salmon in PWS and the sport fishery is supported primarily by hatchery produced fish with a limited harvest of feeder chinook. Chinook salmon smolt have been stocked at Valdez, Cordova, and Whittier and returns from these stocking efforts have established sport fisheries at Whittier and Cordova. Chinook salmon return to hatchery release sites from mid-May through June and anglers can harvest feeder kings throughout the year but with the winter months being most productive.

Most waters of PWS are open to the taking of chinook salmon year around, with a bag and possession limit of 2 fish per day and 4 fish in possession. Closed waters include Eccles Creek, the Eyak Lake drainage, and Hartney Creek, all near Cordova, and all freshwater drainages of Valdez Arm except for Robe River and Solomon Gulch Creek.

From 1983-1993, the mean harvest of chinook salmon from marine waters of PWS has been 690 fish, accounting for 34% of the historical mean harvest of chinook salmon for the CGMA during this period (Table 12 and Figure 12). Just over 43% of this harvest has been from Valdez Arm. The next largest harvest occurs in the non-road-accessible areas in Northwestern PWS which account for 24% of the historical mean harvest. The fishery on the Robe River accounts for the majority of the chinook harvest in Valdez Arm and is the only sport fishery in PWS that is supported by wild stocks. Since 1988 in Valdez, wild stock production has been supplemented by hatchery produced smolt. The first release of chinook salmon at Anderson Bay, which is accessible only by boat, did not prove to be productive in providing additional fishing opportunities and was canceled after only one year. Since 1991, chinook salmon smolt were released at 6.5 Mile Creek, a tributary of Lowe River, to establish a marine fishery near Allison Point. This program has been discontinued due to problems with bacterial kidney disease in brood stock from Ester Hatchery.

The Whittier area sport fishery for chinook salmon is supported primarily on returning hatchery fish. The chinook salmon smolt release program has produced variable returns to the Whittier area and correspondingly the sport harvest has also fluctuated. The harvest has ranged from 0 to 367 chinook salmon from 1983-1993 (Table 12 and Figure 12). This fishery takes place in and around the Whittier boat harbor and near the mouths of Shakespeare and Cove creeks. Both shoreline and boat anglers participate in this fishery. A similar fishery has been established for chinook salmon at Fleming Spit near Cordova. Similar trends to those observed in the Whittier fishery have also occurred. These fisheries are being phased out by PWSAC in order to control problems with bacterial kidney disease in the brood stock.

Recent Fishery Performance

The sport harvest of chinook salmon from PWS waters during 1993 (1,344) is an increase from the historical mean harvest for the area since 1983 (Table 12 and Figure 12).

Harvest and catch figures are not yet available for the 1994 fishery, but it is anticipated that the harvest will be near historic levels for this area.

Management Objective

The stocking of chinook salmon in PWS is accomplished entirely by PNP hatcheries, therefore the following specific management goals are stated as ideals for these stocking programs. For hatchery produced chinook salmon at Whittier, Valdez Arm, and Orca Inlet the management objectives for each location are to: (1) produce through supplemental hatchery production an

annual return of 3,000 chinook salmon, (2) provide 6,000 angler-days of fishing opportunity annually, and (3) promote diverse sport fishing opportunity by providing early-run chinook salmon to both boat and shore-based anglers.

No other specific fishery objectives have been formally established for PWS chinook salmon fisheries to date. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various wild chinook salmon stocks that occur within the CGMA while assuring for continued and, where possible, expanded opportunity to participate in hatchery-supported chinook salmon fisheries in the area.

Recent Board of Fisheries Actions

There has not been any recent regulatory action on this fishery.

Current Issues

The main issue, with regard to chinook salmon fisheries in PWS is the phasing out of chinook stocking activities due to bacterial kidney disease in the brood stock. Residents in the major port communities, especially Whittier, have expressed concern over the loss of this resource and have requested assistance from the state hatchery system and from the PNP hatcheries to find a solution. Currently PWSAC is implementing steps to resolve the disease problem and has received support from the City of Whittier and from the department. It is anticipated that stocking will resume after the problem is resolved, this may, however, take several years. Currently the state chinook production is fully allocated and no stocking in PWS appears to be possible.

Ongoing Research and Management Activities

There are no ongoing research or management activities for this fishery.

Recommended Research and Management Activities

The VFDA has requested assistance in developing a chinook salmon brood stock for release in Valdez Arm. Review of fish transport permits (FTPs) issued in PWS and evaluation of currently available stocks should be conducted by the department.

Prince William Sound Pink Salmon Fishery

There are over 200 streams in PWS that support wild returns of pink salmon. In addition, there are four private nonprofit hatcheries that produce pink salmon. Pink salmon return to PWS from mid-June through late August with the peak of the return occurring in late July.

The sport fishing season is open all year and the bag and possession limit for salmon other than chinook is 6 fish per day and 12 in possession except in the freshwater drainages crossing the Copper River Highway and the Robe River near Valdez, where the bag and possession limits are 3 and 3, respectively. There are some waters that are not open to pink salmon fishing. These waters include Eccles Creek, Eyak Lake drainage, and Hartney Creek all near Cordova, and all freshwater drainages of Valdez Arm except for Robe River and Solomon Gulch Creek.

The pink salmon sport fishery harvest in PWS has been the largest in the state since 1985 (Mills 1994). The average harvest of pink salmon in PWS has been 32,142 fish from 1983 through 1992 which accounted for an average of 84% of the total CGMA pink salmon harvest over this period (Table 14 and Figure 14). Eighty-seven percent of this harvest has been from Valdez Arm. The fishery in Valdez Arm targets early-run pink salmon returning to the VFDA Solomon Gulch Hatchery. The pink salmon return to Solomon Gulch Hatchery has ranged in numbers

from less than a million to nearly 14 million in 1994. The returning pink salmon are intended primarily for the commercial fishery and cost recovery at the Solomon Gulch Hatchery. From 1983-1993, the average harvest of pink salmon from Valdez Arm has been 27,985 fish (Table 14). Shore-based anglers fishing at Allison Point have accounted for 53% of the average harvest from 1983 through 1992 (Table 18 and Figure 18). Other significant fisheries for pink salmon in PWS occur in non road-accessible areas and in Whittier.

Recent Fishery Performance

The sport harvest of pink salmon from PWS waters decreased since 1991 and the 1993 harvest (35,735) was 162% above the historical mean harvest for the area (Table 14). This harvest accounted for just over 89% of the total pink salmon harvest from CGMA waters during 1993. As was the case in the past, the Valdez Arm supported the largest harvest of pink salmon, with 32,479 fish being harvested. In 1993, there were fair pink returns to the hatcheries and poor wild stock returns.

Management Objective

The stocking of pink salmon in PWS is accomplished entirely by PNP hatcheries, therefore the following specific management goals are stated as ideals for these stocking programs. For hatchery produced pink salmon returning to Valdez Arm the management objectives are: (1) produce through supplemental hatchery production a sport harvest of 50,000 pink salmon; (2) provide 25,000 angler-days of pink salmon fishing opportunity annually; and (3) promote diverse sport fishing opportunity by providing pink salmon to both boat and shore-based anglers.

No other specific fishery objectives have been formally established for PWS pink salmon fisheries to date. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various wild pink salmon stocks that occur within the area while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting hatchery stocks.

Recent Board of Fisheries Actions

In 1990, the Board opened Solomon Gulch Creek, adjacent to the VFDA hatchery in Valdez, to salmon fishing 300 feet downstream of the VFDA weir.

Current Issues

The large commercial harvest drives the management of the PWS pink salmon sport fishery. The magnitude of sport harvest will likely remain inconsequential towards achieving escapement goals or determining harvest strategies, however the sport fishery is of great economic importance to the community of Valdez. The Valdez Chamber of Commerce conducts a pink salmon derby and a significant public relations campaign designed to promote fishing related tourism. Conflicts or perceived conflicts between the sport and commercial fisheries have occurred in the past and are of great concern to the community of Valdez. The area managers for these two divisions have worked together with hatchery managers to develop strategies to minimize further conflicts. These strategies include keeping the commercial fleet primarily in the western portion of Valdez Arm and maintaining an area closed to commercial fishing within 300 feet of the shore around Allison Point.

Table 18.-Summary of pink salmon harvest in the Valdez Arm area of Prince William Sound, 1983-1993.

| YEAR | Boat | Shore | Stream | Total Valdez Area |
|---------------------|--------|--------|--------|-------------------|
| 1983 | 8,696 | 0 | 0 | 8,696 |
| 1984 | 9,676 | 12 | 137 | 9,825 |
| 1985 | 16,059 | 12,152 | 239 | 28,450 |
| 1986 | 12,858 | 9,312 | 0 | 22,170 |
| 1987 | 8,855 | 18,216 | 0 | 27,071 |
| 1988 | 10,659 | 16,117 | 0 | 26,776 |
| 1989 | 14,740 | 18,139 | 43 | 32,922 |
| 1990 | 18,077 | 28,653 | 0 | 46,730 |
| 1991 | 16,128 | 32,481 | 9 | 48,618 |
| 1992 | 14,518 | 14,069 | 9 | 28,596 |
| 1993 | 13,417 | 19,062 | 0 | 32,479 |
| 1983-1992 | | | | |
| MEAN | 13,027 | 14,915 | 44 | 27,985 |
| % CHANGE of 1993 | 3% | 28% | -100% | 16% |
| FROM MEAN | | | | |

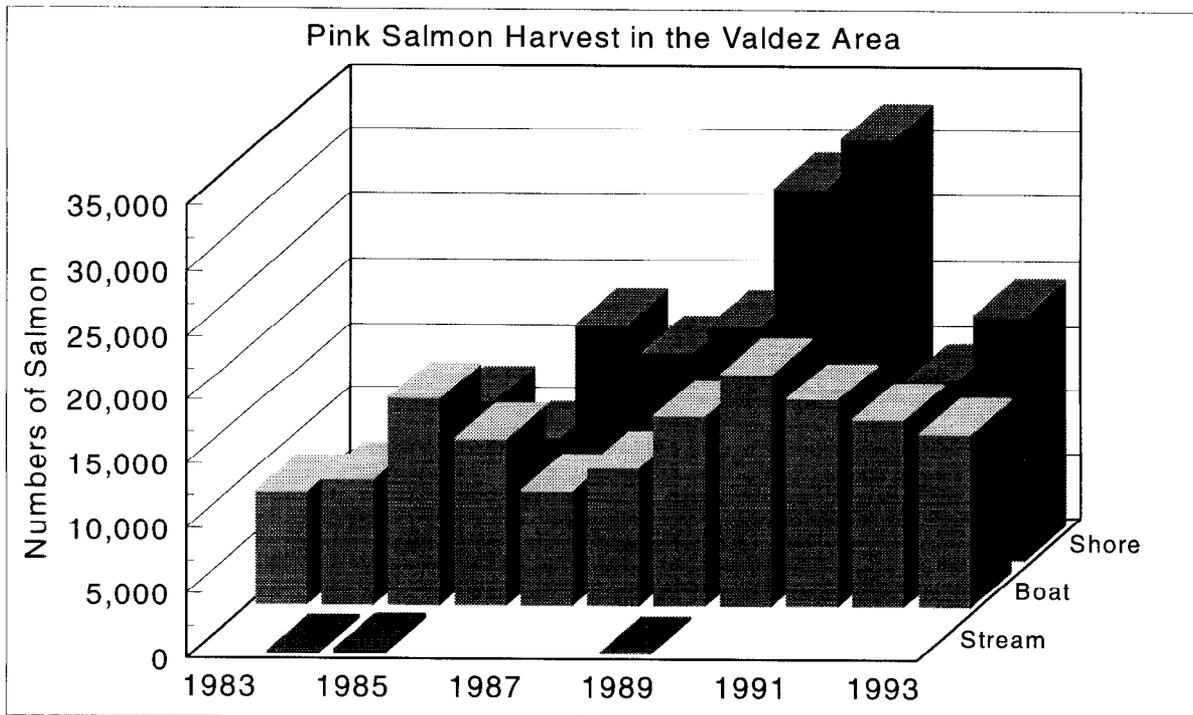


Figure 18.-Summary of pink salmon harvest in the Valdez Arm area of Prince William Sound, 1983-1993.

Ongoing Research and Management Activities

The Division of Sport Fish does not currently conduct any research on pink salmon stocks in PWS, however the Division of Commercial Fisheries conducts extensive research programs in PWS. Area managers for these two divisions should continue to work together to reduce potential conflicts between these fisheries.

Recommended Research and Management Activities

No additional research or management activities are recommended for this fishery at present. At this time, no changes in regulation are recommended with respect to this fishery.

Prince William Sound Sockeye Salmon Fishery

Sockeye salmon return to PWS streams from June through August with peak immigration varying by stream. Spawning occurs from mid-July through September.

Current bag and possession limits governing the sport fishery for salmon other than chinook are 6 and 12 fish, respectively, except in all freshwater drainages crossed by the Copper River Highway, including Clear Creek, where the bag and possession limit is 3 fish; in Eshamy Creek drainage the limits are 3 fish per day and 6 in possession; and in Robe River, near Valdez, the bag and possession limit is 1 fish.

Historically the major fisheries for sockeye in PWS have occurred at Eshamy, Cordova, Valdez and Coghill. From 1983 through 1992, the average harvest of sockeye salmon from PWS has been 4,627, (Table 19 and Figure 19). Just over 69% of this harvest has been from non road-accessible areas of PWS (Eshamy, Coghill and "other"). Since 1983, the average harvest of sockeye salmon from non road-accessible areas has been 2,789 fish. The sockeye fisheries at Coghill and Eshamy have dropped significantly in recent years. Coghill has been closed entirely in 1992, 1993 and 1994, and the seasons at Eshamy have been reduced during those same years.

Recent Fishery Performance

The sport harvest of sockeye salmon from PWS during 1993 (5,269) was approximately 3,000 fish below the 1992 record harvest (Table 19 and Figure 19), but was still 14% above the 1983 through 1992 average. The harvest of sockeye from non road-accessible areas represented 51% of the total PWS harvest. The harvest of sockeye salmon from Valdez Arm also declined in 1993, but was still 2% above the 1983 through 1992 average.

The 1992 record harvest was the result of a large harvest at the remote area near Davis Lake. Sockeye smolt were released into Davis Lake in 1990 in an attempt to build a brood source for Coghill Lake egg takes and to possibly create another off-station release location for the commercial fishery. Because of concerns for wild stocks of sockeye returning to Coghill Lake in 1992, the commercial fishery was able to operate in the vicinity of Golden Lagoon and anglers were afforded an excellent opportunity to harvest hatchery produced sockeye salmon. The fishery proved to be successful for sport fishing and was popular with not only private boat owners but also aircraft charter operators based in Anchorage. This program was discontinued, however, in 1993 due to continued concerns over Coghill stock interception.

In 1992, the department issued emergency orders that closed both the sport (Sport Fish E.O. Number 2-RS-6-17-92) and commercial fishery targeting sockeye salmon stocks returning to Coghill Lake. These actions were apparently successful; the final escapement for Coghill Lake

Table 19.-Sport harvests of sockeye salmon in Prince William Sound, 1983-1993.

| YEAR | Coghill | Eshamy | Valdez | Cordova | Other | Grand Total |
|-----------|---------|--------|--------|---------|-------|-------------|
| 1983 | 781 | 1,315 | 343 | 1,082 | 1,603 | 5,124 |
| 1984 | 249 | 1,048 | 811 | 112 | 1,857 | 4,077 |
| 1985 | 554 | 836 | 1,085 | 130 | 303 | 2,908 |
| 1986 | 657 | 688 | 413 | 321 | 2,799 | 4,878 |
| 1987 | 417 | 634 | 1,756 | 507 | 1,575 | 4,889 |
| 1988 | 146 | 637 | 1,582 | 600 | 1,818 | 4,783 |
| 1989 | 344 | 352 | 881 | 661 | 1,701 | 3,939 |
| 1990 | 49 | 175 | 1,630 | 466 | 1,242 | 3,562 |
| 1991 | 0 | 152 | 1,471 | 806 | 1,325 | 3,754 |
| 1992 | 0 | 649 | 2,153 | 1,578 | 3,978 | 8,358 |
| 1993 | 79 | 581 | 1,235 | 1,321 | 2,053 | 5,269 |
| 1983-1992 | | | | | | |
| MEAN | 320 | 649 | 1,213 | 626 | 1,820 | 4,627 |
| % CHANGE | | | | | | |
| of 1993 | -75% | -10% | 2% | 111% | 13% | 14% |
| FROM MEAN | | | | | | |

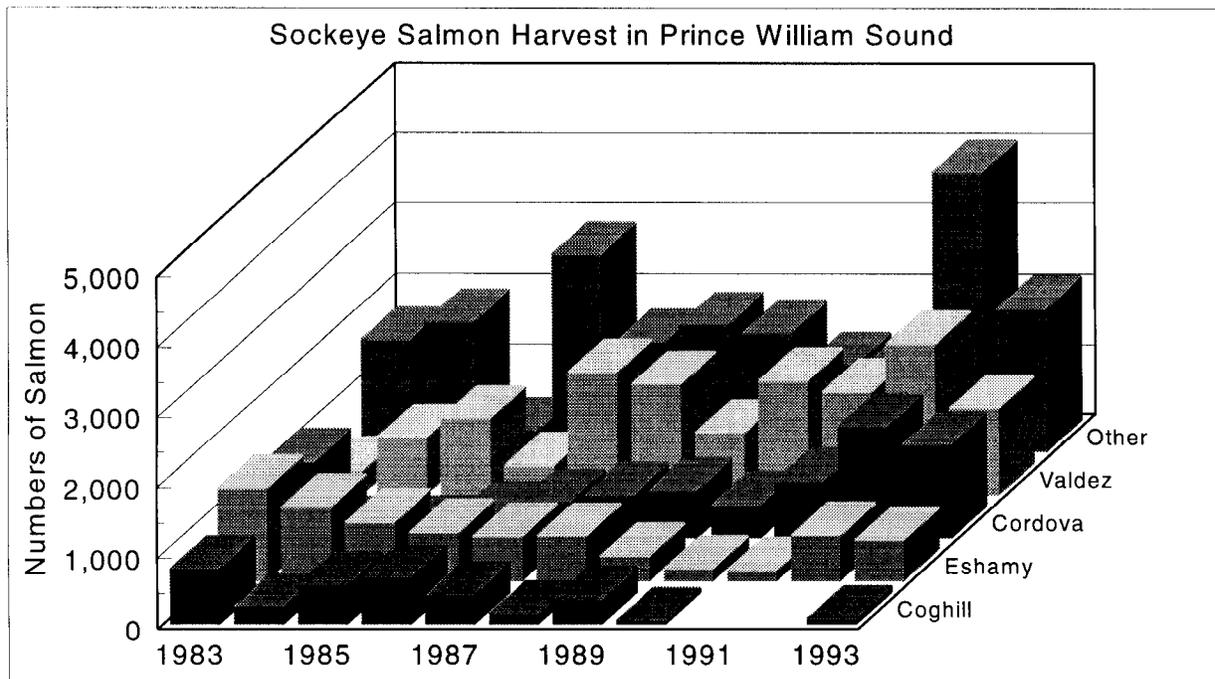


Figure 19.-Sport harvests of sockeye salmon in Prince William Sound, 1983-1993.

sockeye exceeded 31,000, which is 6,000 fish over the interim escapement goal of 25,000. Additionally, Eshamy Lake received a strong return of sockeye salmon with escapement exceeding the minimum escapement goal. This return provided excellent opportunities for recreational anglers and resulted in some of the best fishing anglers have seen in years at Eshamy.

The 1993 and 1994 returns of sockeye to Coghill were insufficient to meet escapement goals, consequently the sport and commercial fisheries were closed. During these same years the sockeye fishery at Eshamy was reduced due to low early returns. A result of these low returns was the emergency closure of Eshamy to sport fishing in 1993 and 1994. The timing of returns to Eshamy Lagoon appears to be getting later. Whereas escapement goals were met in 1993 and 1994, the timing of the peak returns has shifted from mid-August to late September.

Management Objective

For sockeye salmon returning to Eshamy and Coghill lakes, the management objective is to meet the minimum escapement goals (35,000 Eshamy and 25,000 Coghill) while providing for at least 2,000 angler-days of effort annually at each location.

No other specific fishery objectives have been formally established for PWS sockeye salmon fisheries to date. An underlying assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various wild sockeye salmon stocks that occur within PWS while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting these stocks.

Recent Board of Fisheries Actions

No specific actions were taken by the Board with respect to this fishery during their 1994 meeting.

Current Issues

Coghill Lake has produced total adult returns of sockeye salmon as high as one million. The department manages the fishery to achieve an escapement of 40,000-60,000 spawners. From 1987-1992, despite management efforts (including closures of both sport and commercial fisheries targeting Coghill Lake sockeye), the sockeye escapement into Coghill Lake declined. In 1992, the interim escapement goal was met. Edmundson et al. (1991) suggested that Coghill Lake received overescapements in the 1980s and the lake is an excellent candidate for fertilization.

Eshamy Lake has an escapement goal of 30,000 fish and this escapement goal has been obtained only six times since 1967. Whereas Coghill Lake may have been a victim of overescapement, Eshamy Lake salmon are considered a depressed stock due to overexploitation in the commercial fishery. The largest harvest (approximately 50%) takes place in the Southwestern purse seine district and the remaining commercial harvest occurs in the Eshamy and Coghill gill net districts.

Prince William Sound Aquaculture Corporation, a regional private nonprofit hatchery association, has released sockeye smolt in both Coghill and Eshamy lakes to rehabilitate the lakes and provide additional fish to the common property fisheries. These fish have been produced at the Main Bay Hatchery. Sockeye salmon returning to Coghill have the same run timing as chum salmon returning to Wally Noerenberg Hatchery. Enhancement of Coghill Lake has the potential

to exacerbate the mixed stock fishery that already exists in the Esther Subdistrict. There are also parallel concerns for the release of smolt into Eshamy Lake.

At the present time there is no basic management plan for the Main Bay facility. The department continues to work with staff from PWSAC to draft a Basic Management Plan for the Main Bay Hatchery facility which addresses the department's concerns, the user's concerns, and the hatchery concerns.

Sport Fish Division and the Division of Commercial Fisheries Management and Development have established a management strategy that governs how the fisheries are prosecuted on Eshamy Lake sockeye stocks. This strategy for a projected escapement of less than 35,000 sockeye salmon into Eshamy Lake calls for:

1. closure of the eastern shore of Chenega Island to commercial purse seine fishing,
2. closure of the Crafton Island Subdistrict of the Eshamy District to drift and set gill net fishing, and
3. closure of the Eshamy drainage to sport fishing.

Ongoing Research and Management Activities

No specific research or management activities are directed at this fishery by Division of Sport Fish although the Division of Commercial Fisheries conducts an extensive research and management program.

Recommended Research and Management Activities

No additional research or management activities are recommended for this fishery at present.

Prince William Sound Cutthroat Trout Fisheries

Cutthroat trout are available to anglers throughout the year in the CGMA, however, peak fishing opportunities typically occur as the fish migrate to and from overwintering and spawning areas. Peak harvest typically occurs in May and from mid-July through September. Spawning begins in April and lasts into June.

The daily bag and possession limit for PWS is 2 cutthroat trout with no size limit except for the freshwater drainages crossed by the Copper River Highway. In these road accessible areas, the bag and possession limit is 5 of which no more than 1 can be over 10 inches in length. Historically all streams in the CGMA were open year long to fishing for cutthroat trout. A Board of Fisheries action in 1994 established a spawning season closure from April 15 through June 14

The average harvest of cutthroat trout in PWS has been 1,234 fish for 1983 through 1992 (Table 20 and Figure 20). There are three major historical harvest areas for cutthroat trout in PWS, Eshamy drainage, Eyak drainage, and other Cordova road accessible streams, which account for 16%, 19% and 34%, respectively, of the PWS harvest. Other sites dispersed throughout the northern and eastern portions of the sound account for the remaining 31% of the harvest.

Recent Fishery Performance

The sport harvest of cutthroat trout from PWS during 1993 (940) was 24% below the historical mean harvest for the area (Table 20). The harvests in the three major historical harvest areas for cutthroat trout in PWS, Eshamy drainage, Eyak drainage, and other Cordova road accessible

Table 20.-Sport harvests of cutthroat trout in Prince William Sound, 1983-1993.

| YEAR | Eyak Drainage | Other Cordova Area | Eshamy Area | Other PWS Areas | Grand Total |
|---------------------|---------------|--------------------|-------------|-----------------|-------------|
| 1983 | 356 | 1,080 | 147 | 241 | 1,824 |
| 1984 | 137 | 736 | 274 | 1,395 | 2,542 |
| 1985 | 119 | 69 | 554 | 173 | 915 |
| 1986 | 214 | 687 | 153 | 566 | 1,620 |
| 1987 | 833 | 217 | 272 | 36 | 1,358 |
| 1988 | 109 | 109 | 219 | 182 | 619 |
| 1989 | 300 | 553 | 39 | 619 | 1,511 |
| 1990 | 164 | 147 | 33 | 179 | 523 |
| 1991 | 68 | 48 | 213 | 87 | 416 |
| 1992 | 73 | 559 | 0 | 383 | 1,015 |
| 1993 | 75 | 335 | 11 | 519 | 940 |
| 1983-1992 | | | | | |
| MEAN | 237 | 421 | 190 | 386 | 1,234 |
| % CHANGE of 1993 | -68% | -20% | -94% | 34% | -24% |
| FROM MEAN | | | | | |

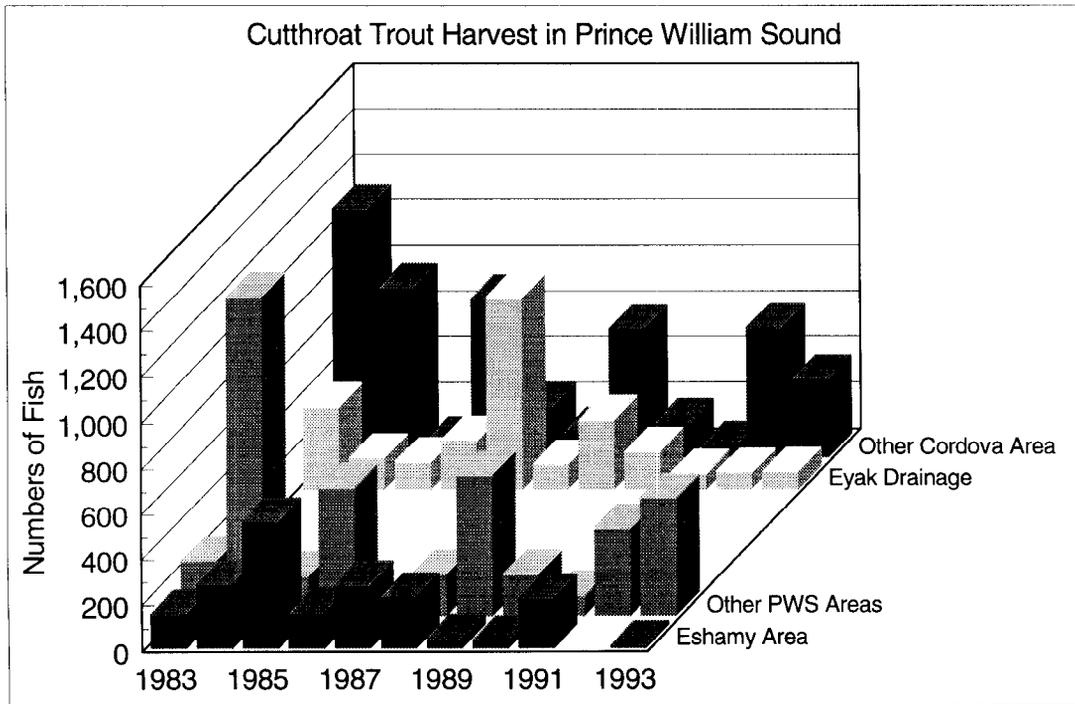


Figure 20.-Sport harvests of cutthroat trout in Prince William Sound, 1983-1993.

streams were all well below the historical average by 94%, 68% and 20%, respectively. The harvest of cutthroat trout in areas outside these locations increased by 130 fish over the 1992 harvest, an increase of 34%.

Eshamy Creek drainage and Green Island Creek were closed by emergency order (2-CT-6-02-92) in 1992 during the spawning season. Information collected by the Natural Resource Damage Assessment program following the *Exxon Valdez* oilspill indicated that cutthroat in the oil impacted area had reduced survival and growth. There was concern that the stocks may be unable to sustain historical levels of harvest, especially during spawning season. This emergency order reduced the harvest to zero in these areas. A similar emergency order was also written in 1993. Board of Fisheries actions in 1994 established a spawning closure from April 15 through June 14.

Management Objective

The management objective for cutthroat trout is to stabilize the harvest of cutthroat trout to 500 fish while still providing 2,000 angler-days of fishing effort. This harvest level represents approximately an overall 10% fishing mortality on PWS cutthroat trout and should aid in the recovery of stocks impacted by the *Exxon Valdez* oil spill.

Recent Board of Fisheries Actions

During the 1991 Board meeting, the PWS bag and possession limit for cutthroat trout was reduced from a daily bag and possession limit of 5 fish per day and 10 in possession of which only 1 per day and 2 in possession can be over 20 inches in length to a 2 fish daily bag and possession limit with no size limit except for the freshwater drainages crossed by the Copper River Highway. In these road-accessible areas, the bag and possession limit is 5, of which no more than 1 can be over 10 inches in length. As mentioned earlier, Board of Fisheries actions in 1994 established a spawning closure from April 15 through June 14.

Current Issues

Prince William Sound is the most northern and western extreme of the natural range for cutthroat trout and the populations are small in size and distribution. Populations of fish on the outer extremes of their distribution tend to be more susceptible to environmental changes and exhibit highly variable survival rates. Cutthroat trout are also subject to incidental catch in the commercial fisheries increasing the risk to these small stocks. There are concerns regarding the sustainability of even the present small harvest. Some specific cutthroat trout stocks in the Pacific northwest have been selected as candidates for being listed as threatened species under the Endangered Species Act. Careful management is necessary to avoid this possibility for the PWS stocks.

Information collected by the Natural Resource Damage Assessment program following the *Exxon Valdez* oil spill documented injury to cutthroat trout in western PWS (Hepler et al. *In prep*). Mortality rates of sea-run cutthroat trout from oiled areas (Green Island and Eshamy creeks) were significantly higher than from sites in the nonoiled areas of eastern PWS. There was also a significant reduction in growth of fish from oiled sites. Both Green Island and Eshamy creeks are popular sport fishing sites supporting small populations of sea-run cutthroat trout numbering less than 200 fish. Given the additional mortality due to oil effects, available information suggests that oil impacted stocks may be unable to sustain historical levels of harvest. Reduction in growth due to oil perturbation may result in lowered reproductive potential. Each of these

possible repercussions causes immediate concerns for the cutthroat stocks of Green Island and Eshamy creeks.

Ongoing Research and Management Activities

There are no ongoing research projects for this fishery by the department, however, the department has provided support for an oil spill funded research project being conducted by the Cordova Ranger District of the U.S. Forest Service at Mile 18 on the Copper River Highway. This project is monitoring the escapement of cutthroat into this system and is radio-tracking fish to determine spawning locations for characterization of spawning habitat requirements. Data collected will be used to identify locations for restoration of cutthroat habitat loss due to road construction and logging along the Cordova Road System.

Two other oil-spill funded restoration/enhancement projects are being conducted in western PWS by the Glacier Ranger District of the U.S. Forest Service. One consists of the enhancement of spawning and rearing habitat for cutthroat trout in Otter Creek on the north end of Otter Lake. The other is directed toward the enhancement of rearing habitat at three locations: Gunboat Creek in Eshamy Bay, Billy's Hole in Long Bay, and Red Creek which drains into Esther Passage.

Recommended Research and Management Activities

Cutthroat trout typically spawn from April through June. Fishing for cutthroat during critical spawning periods, even if released, places additional stress on the fish. This stress increases fishing related mortality and further impacts the reproductive potential of this resource. Even though the department has information on the impact of oil from only two sites, data suggest that these sites are locations of overwintering populations comprised of a number of different spawning stocks. Consequently, the only way to effectively reduce fishing mortality on these stocks is to enact areawide restrictions. Based on this information, the department issued emergency orders restricting the harvest of cutthroat trout in PWS in 1992 and 1993. The department also submitted a proposal to prohibit fishing for cutthroat trout during the spawning season from April 16 through June 15. The proposal was considered by the BOF during the February 1994 meeting and was enacted.

CENTRAL GULF AREAWIDE FISHERIES

Central Gulf Management Area Halibut Fishery

Halibut are one of the most popular targets of recreational anglers fishing the marine waters of the CGMA. The majority of halibut are harvested from May through early September. The limits for halibut are 2 fish per day and 4 fish in possession. The fishery is open year-round with the exception of January when the fishery is closed to protect spawning halibut. Management issues and stock status are discussed by Vincent-Lang (1995) in the Area Management Report for the North Gulf Coast Alaska Recreational Groundfish Fisheries. Halibut and their fisheries are managed under an international treaty, the Halibut Convention of 1953 and its 1979 Protocol, therefore the Alaska Board of Fisheries has no management authority over halibut in Alaska.

The average sport harvest of halibut from CGMA area waters from 1983 through 1992 has been about 17,500 (Table 21). During this period, harvests have risen annually, from approximately 2,900 halibut in 1983 to over 36,000 halibut in 1992 (Figure 21).

Table 21.-Sport harvest of halibut in the Central Gulf Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 0 | 0 | 0 | 0 | 284 | 1,363 | 2,225 | 0 | 1,846 | 5,718 |
| 1984 | 0 | 237 | 200 | 0 | 0 | 387 | 2,282 | 3,242 | 0 | 1,322 | 7,670 |
| 1985 | 0 | 33 | 0 | 54 | 33 | 826 | 195 | 5,934 | 76 | 3,310 | 10,461 |
| 1986 | 91 | 596 | 0 | 305 | 474 | 1,086 | 2,018 | 10,398 | 92 | 3,669 | 18,729 |
| 1987 | 156 | 253 | 0 | 77 | 495 | 650 | 331 | 7,171 | 232 | 2,185 | 11,550 |
| 1988 | 649 | 963 | 48 | 193 | 312 | 1,143 | 1,120 | 11,696 | 818 | 4,599 | 21,541 |
| 1989 | 540 | 809 | 41 | 612 | 268 | 912 | 341 | 7,290 | 943 | 4,231 | 15,987 |
| 1990 | 1,075 | 486 | 22 | 329 | 860 | 1,038 | 418 | 9,500 | 578 | 6,045 | 20,351 |
| 1991 | 1,227 | 1,463 | 79 | 149 | 881 | 1,484 | 802 | 13,818 | 526 | 6,122 | 26,551 |
| 1992 | 1,578 | 2,305 | 125 | 358 | 945 | 1,151 | 2,247 | 18,595 | 767 | 8,379 | 36,450 |
| 1993 | 2,737 | 2,165 | 93 | 446 | 521 | 1,705 | 2,697 | 25,551 | 895 | 8,457 | 45,267 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 532 | 715 | 52 | 208 | 427 | 896 | 1,112 | 8,987 | 403 | 4,171 | 17,501 |
| % CHANGE of 1993 FROM MEAN | 415% | 203% | 81% | 115% | 22% | 90% | 143% | 184% | 122% | 103% | 159% |

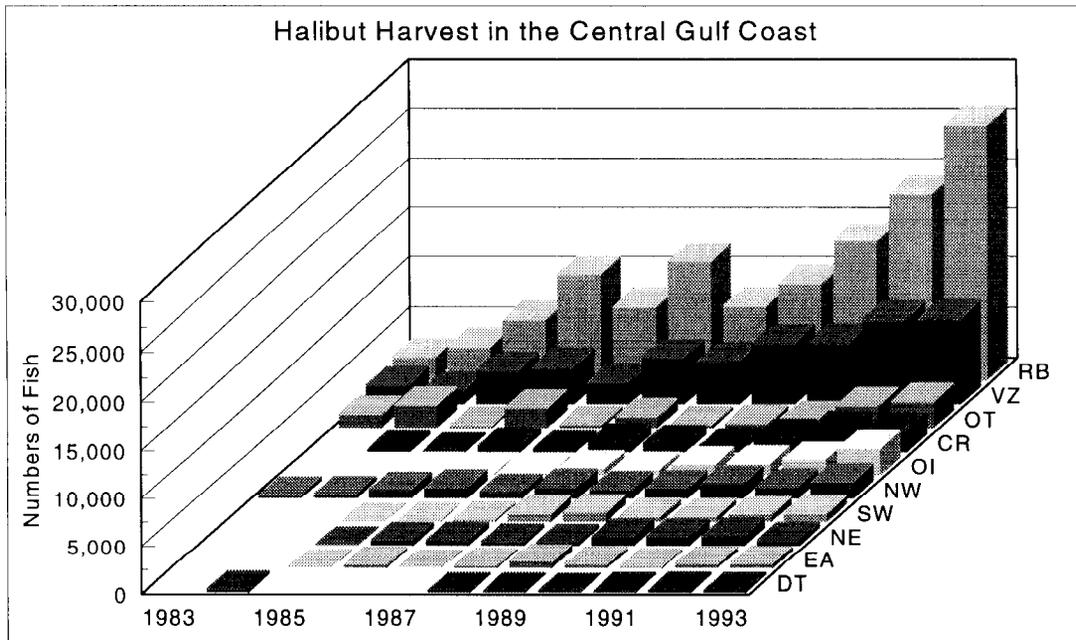


Figure 21.-Sport harvest of halibut in the Central Gulf Area, 1983-1993.

Seward area fisheries have consistently supported about half of the total harvest of halibut from CGMA waters (Table 21). Waters accessed from Seward extend from the entrances of Prince William Sound west to Gore Point with most of the effort occurring between Cloudy Cape to Cape Junken. Prince William Sound has supported an average sport harvest of about 8,500 halibut (Table 21) from 1983 through 1992. Waters fished in PWS include all inside waters as well as the entrances to PWS, with most of the effort occurring at the entrances. As has been the case for overall CGMA harvests, PWS halibut harvests have also increased near annually, from about 1,000 halibut in 1978 to about 20,000 halibut in 1993. The majority of the PWS halibut harvest has been by anglers returning to Valdez (Table 21). From 1983 through 1992, anglers returning to Valdez have harvested an average of 4,171 halibut.

The sport harvest of halibut from the CGMA during 1993 (45,267) was the highest on record and nearly triple the historical mean harvest from 1983 through 1992 (Table 21). As has been the case in the past, nearly half the halibut harvest has come from Seward area waters, with the remaining harvest coming from PWS waters (Table 21). Harvests in both PWS and the Seward area were records. As in the past, Valdez harvest accounted for the majority of the total PWS halibut harvest (Figure 21). Considerable expansion in both the charter and private fleets has occurred in recent years in both PWS and the Seward areas. Harvest and catch estimates for halibut are not yet available for the 1994 season; however, observations indicate that effort and harvest during 1994 were similar to 1993 levels.

Management Authority

Halibut and their fisheries are managed under an international treaty, the Halibut Convention of 1953 and its 1979 Protocol. Under this treaty, the International Pacific Halibut Commission (IPHC) was formed to assure for the optimal sustained yield of the North Pacific halibut resource. For purposes of management, the IPHC has divided the North Pacific halibut fishery into 10 regulatory areas, stretching from northern California to Alaska. The CGMA falls in regulatory area 3A. Each year, the IPHC establishes separate catch quotas for each of these regulatory areas that assures for the halibut stock's optimal sustained yield. These catch quotas represent the maximum number of halibut that can be harvested from each area annually and, under the treaty, total harvest by all users groups cannot exceed these quotas. The IPHC does not, however, have the authority to allocate the catch quota amongst the various fisheries exploiting the halibut stock in United States waters. In U.S. waters, the responsibility for allocation of the catch quota amongst fisheries falls to the North Pacific Fishery Management Council (NPFMC) via the Magnuson Fisheries Conservation and Management Act of 1976. The Alaska Department of Fish and Game, Division of Sport Fish, provides technical data and other information to both the IPHC and the NPFMC to aid in making management and allocation decisions. The State of Alaska does not have direct management authority over halibut and halibut fisheries off Alaska.

Management Objective

Under treaty, North Pacific halibut stocks are to be managed for optimum sustained yield. Currently, the North Pacific halibut stock is fully utilized.

Management Approach

A constant exploitation strategy is used to manage North Pacific halibut stocks. The IPHC meets annually in January to calculate the exploitable biomass (yield) available for harvest in each of the 10 regulatory areas. Constant exploitation yield (CEY) is calculated for each regulatory area

as the estimated exploitable biomass available times a 0.30 exploitation rate. Each CEY thus represents the total allowable harvest (in pounds) for each regulatory area. Under treaty, total harvest by all user groups cannot exceed this figure. The IPHC then estimates the sport (based on a 2 fish daily bag limit and 4 fish possession limit and February 1 through December 31 open season) and personal-use/subsistence harvests and wastage and bycatch mortalities for each regulatory area. These are subtracted from the CEY on a regulatory area basis. The remainder is then "allocated" to the directed commercial halibut fishery. This factoring of the catch has, to the present, been done by the IPHC and the final numbers "approved" by the NPFMC on an annual basis. Under this management approach CEY changes annually, reflective of the estimated biomass of exploitable halibut present (i.e., quotas are lower during years of low exploitable biomass and higher during years of high exploitable biomass).

Ongoing Research and Management Activities

Sport Fish Division's research program to evaluate the age and size compositions of the recreational halibut harvests from Area 3A waters will continue during 1995. Area 3A ports currently being sampled include Valdez and Seward in the CGMA and Kodiak and Homer. Findings from this research program are provided to the IPHC annually in a report summarizing the characteristics of the sport harvest from Area 3A waters. This information is used by the IPHC scientific staff in a constant exploitation yield model which is used annually to compute the exploitable halibut biomass by area. Secondary objectives of the study are to provide fishery managers with information regarding characteristics of the fishing fleet operating out of study ports. These data are needed to evaluate proposed regulatory options for the sport charter industry in Alaska. Staff recommend continuation of the above described research for the immediate future.

Central Gulf Management Area Rockfish Fisheries

Rockfish are a popular target of recreational anglers fishing CGMA marine waters and a variety of rockfishes, species of the genera *Sebastes* and *Sebastolobus*, inhabit the marine waters of the CGMA. For management purposes, these rockfishes are usually categorized into the following groups: slope rockfish, demersal shelf rockfish, and pelagic shelf rockfish. The recreational fishery primarily targets the demersal shelf and pelagic shelf rockfish groups, with slope rockfish only occasionally being harvested. Although many species of rockfish have been identified in the CGMA, the most commonly harvested rockfish in the CGMA are the demersal shelf yelloweye rockfish *Sebastes ruberrimus*, and pelagic shelf black *S. melanops* and dusky *S. ciliatus* rockfishes. Management, current issues and stock status are discussed by Vincent-Lang (1995) in the Area Management Report for the North Gulf Coast Alaska Recreational Groundfish Fisheries.

Although available year-round, most recreational rockfish are harvested from May through early September. The limits for rockfish in PWS are 5 per day and 10 in possession from May through September and 10 and 15 per day and in possession from September 16 through April 30. Also, all rockfish which are removed from the water must be retained as part of the bag limit of the person originally hooking it. The rockfish limits for the Outer Gulf Coast (Seward area) are 5 per day and 10 in possession year-round.

The average sport harvest of rockfish from CGMA waters from 1983 through 1992 has been about 33,500 (Table 22, Figure 22). Outer Gulf Coast waters accessible from Seward have accounted for 71% of the total rockfish harvest from CGMA waters. The Seward area rockfish fishery is one of the largest recreational rockfish fisheries in Alaska (Mills 1994). Areas fished near Seward include waters from the entrances to Prince William Sound to Gore Point; however, most of the fishery occurs in the vicinity of the capes and islands near the entrance to Resurrection Bay. Since 1983, PWS has supported an average sport harvest of about 9,800 rockfish (Table 22). This harvest has represented about 29% of the total harvest of rockfish from CGMA waters. Waters fished in PWS include all inside waters as well as the entrances to PWS, with most of the effort occurring at the entrances.

Commercial fishermen also harvest CGMA rockfish. Commercial harvests in PWS generally exceed those of recreational harvests. In contrast, recreational and commercial harvests in Outer Gulf Coast waters are more equal. During some years, recreational harvests from the marine waters near Seward have exceeded reported commercial harvests.

The sport harvest of rockfish from CGMA waters during 1993 (37,252) was 11% above the historical mean harvest from 1983 through 1992 (Table 22). As in the past, Seward area waters accounted for the majority (67%) of total rockfish harvest from CGMA. The increase in harvest from Seward area waters is believed due to a shift in effort from depressed lingcod stocks towards rockfish stocks. The harvest of rockfish from Prince William Sound in 1993 was slightly below (9%) the average harvest since 1983. Most of the harvest was landed at Valdez and appeared to be due to a popular charter effort at this port.

Management Objective

Due to a lack of stock assessment data, no specific fishery objectives have been formally established for recreational rockfish fisheries of the CGMA. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various rockfish stocks that occur within the area while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting these stocks.

Recent Board of Fisheries Actions

In 1991, the Board reduced the limits for rockfish in PWS from 20 per day and in possession to 5 per day and 10 in possession from May through September 15, and 10 per day and in possession from September 16 through April 30. Additionally, the Board mandated that all rockfish which are removed from the water must be retained as part of the bag limit of the person originally hooking them. These actions were taken to assure harvests would remain sustainable.

Ongoing Research and Management Activities

A research program to evaluate rockfish stocks in the North Gulf of Alaska is currently underway. The objectives of this program are to collect age, sex, and length composition data and to obtain species composition statistics for the sport harvest of rockfish in this area. These data will be used to determine selected life history characteristics of the commonly harvested rockfish species and to evaluate stock status and validity of current management strategies. Staff recommend continuation of the current research program.

Table 22.-Sport harvest of rockfish in the Central Gulf Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 0 | 0 | 0 | 0 | 1,112 | 1,699 | 17,990 | 0 | 3,703 | 24,504 |
| 1984 | 0 | 37 | 0 | 0 | 0 | 836 | 2,706 | 22,882 | 12 | 4,402 | 30,875 |
| 1985 | 0 | 380 | 0 | 0 | 0 | 1,974 | 97 | 17,105 | 98 | 6,304 | 25,958 |
| 1986 | 34 | 145 | 0 | 346 | 0 | 1,810 | 1,005 | 38,660 | 56 | 6,366 | 48,422 |
| 1987 | 0 | 0 | 0 | 388 | 456 | 1,971 | 78 | 12,768 | 495 | 3,175 | 19,331 |
| 1988 | 192 | 169 | 0 | 469 | 578 | 2,371 | 1,011 | 35,688 | 938 | 6,983 | 48,399 |
| 1989 | 125 | 270 | 0 | 290 | 343 | 2,374 | 1,068 | 24,946 | 1,377 | 7,072 | 37,865 |
| 1990 | 378 | 136 | 10 | 156 | 642 | 1,398 | 466 | 18,729 | 621 | 4,350 | 26,886 |
| 1991 | 256 | 477 | 0 | 0 | 383 | 2,497 | 366 | 19,803 | 775 | 3,979 | 28,536 |
| 1992 | 430 | 879 | 0 | 370 | 1,621 | 1,483 | 1,103 | 28,729 | 1,967 | 7,625 | 44,207 |
| 1993 | 1,563 | 335 | 18 | 233 | 395 | 2,158 | 1,519 | 24,978 | 1,159 | 4,894 | 37,252 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 142 | 249 | 1 | 202 | 402 | 1,783 | 960 | 23,730 | 634 | 5,396 | 33,498 |
| % CHANGE of 1993 FROM MEAN | 1005% | 34% | 1700% | 15% | -2% | 21% | 58% | 5% | 83% | -9% | 11% |

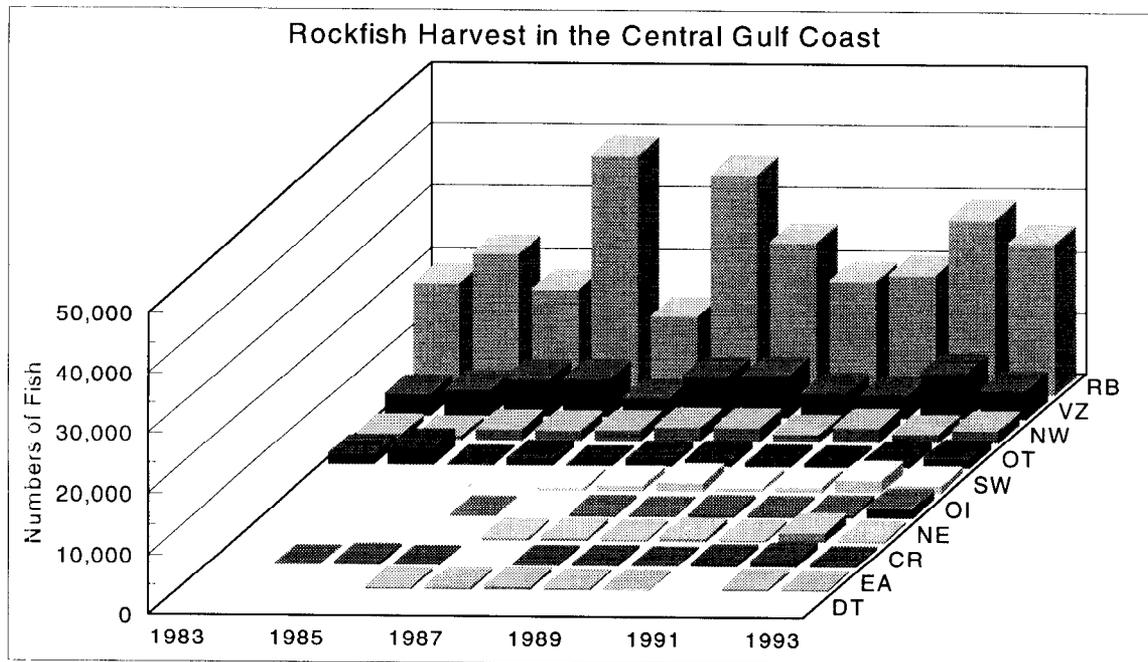


Figure 22.-Sport harvest of rockfish in the Central Gulf Area, 1983-1993.

Central Gulf Management Area Lingcod Fisheries

A complete history of the recreational and commercial fisheries for lingcod in the north Gulf of Alaska through 1992 is provided in Vincent-Lang and Bechtol (1992), Meyer (1993), and Hepler et al. (1993). Management, current issues and stock status are discussed by Vincent-Lang (1995) in the Area Management Report for the North Gulf Coast Alaska Recreational Groundfish Fisheries. These reports also summarize the actions taken by the Board of Fisheries to manage these stocks for sustained yield and the rationale the Board used towards taking these actions.

Current regulations governing recreational lingcod fisheries in the CGMA are:

- Resurrection Bay, enclosed from a line extending from Cape Aialik to Cape Resurrection, is closed to the commercial and recreational harvest of lingcod. All lingcod caught in these waters must be released immediately. (This regulation was put in place in 1993 to protect and help rebuild severely depressed lingcod stocks in these waters.)
- The bag and possession limit for sport caught lingcod in the area between Cape Puget and Gore Point is 1. (This regulation was put in place in 1993 to protect and help rebuild depressed lingcod stocks in these waters.) The bag and possession limit for all other waters of the CGMA are 2 and 4, respectively.
- Lingcod may only be retained from July 1 through December 31. (The closed period was put in effect in 1993 to protect spawning and nest guarding lingcod.)
- Only lingcod 35 inches or more in total length or 28 inches or more with their head off may be retained. (This regulation was established in 1993 to assure lingcod could spawn at least once prior to being subject to harvest.)
- All sport caught lingcod may be landed only by hand or net. (This regulation was put in place in 1993 to increase the survival of released lingcod.)

Harvest estimates from the statewide harvest survey for lingcod were not made until 1991. The 3-year average for the CGMA recreational lingcod fishery is 9,381 fish. The 1993 harvest for lingcod (5,087) was less than half the previous year's harvest (Table 23 and Figure 23). This decrease in harvest during 1993 is believed to be the result of restrictions placed on Central Gulf of Alaska lingcod fisheries to protect depressed stocks in and near Resurrection Bay and to assure for the sustained yield of currently healthy stocks in other CGMA waters. As has been the case in the past, most of the harvest occurred in the waters outside, but near to, Resurrection Bay (notably the Chiswell Islands).

Management Objective

Management of Central Gulf of Alaska lingcod stocks is directed towards assuring for the sustained yield of the various lingcod stocks that occur within the area while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting these stocks.

Management Approach

In the marine waters of the CGMA, insufficient data are currently available to estimate exploitable biomass. No research is currently being conducted, nor planned, to collect these data in the near future. Thus, recreational lingcod fisheries in the CGMA are managed using a

Table 23.-Sport harvests of lingcod in the Central Gulf Area, 1983-1993.

| YEAR ^a | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|-------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | - | - | - | - | - | - | - | - | - | - | - |
| 1984 | - | - | - | - | - | - | - | - | - | - | - |
| 1985 | - | - | - | - | - | - | - | - | - | - | - |
| 1986 | - | - | - | - | - | - | - | - | - | - | - |
| 1987 | - | - | - | - | - | - | - | - | - | - | - |
| 1988 | - | - | - | - | - | - | - | - | - | - | - |
| 1989 | - | - | - | - | - | - | - | - | - | - | - |
| 1990 | - | - | - | - | - | - | - | - | - | - | - |
| 1991 | 142 | 157 | 0 | 0 | 71 | 274 | 118 | 6,126 | 95 | 1,122 | 8,105 |
| 1992 | 337 | 177 | 9 | 37 | 74 | 252 | 121 | 8,081 | 92 | 1,476 | 10,656 |
| 1993 | 343 | 74 | 20 | 27 | 80 | 150 | 49 | 3,079 | 148 | 1,117 | 5,087 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 240 | 167 | 5 | 19 | 73 | 263 | 120 | 7,104 | 94 | 1,299 | 9,381 |
| % CHANGE of 1993 | 43% | -56% | 344% | 46% | 10% | -43% | -59% | -57% | 58% | -14% | -46% |
| FROM MEAN | | | | | | | | | | | |

^a Lingcod harvest not reported in SWHS until 1991.

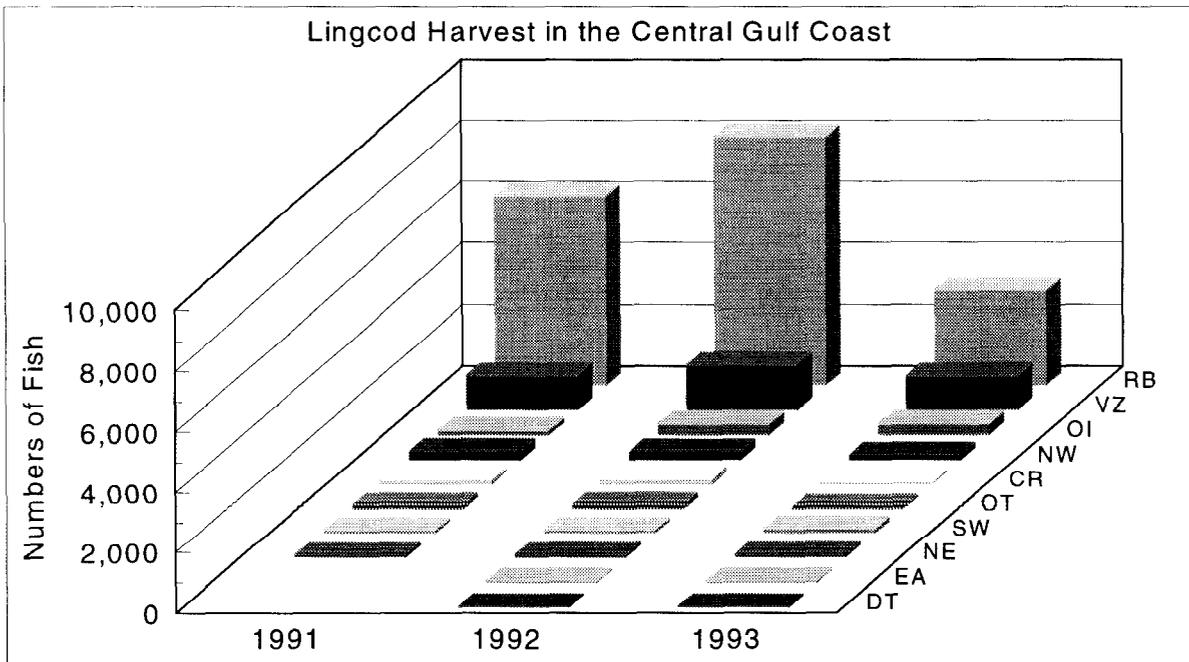


Figure 23.-Sport harvests of lingcod in the Central Gulf Area, 1983-1993.

conservative approach aimed at assuring optimal sustained yield. Given that lingcod recruitment has been shown to be highly variable, the current management approach is to assure that sufficient fish are present in the spawning population to assure for future recruitment. This is done in three ways: (1) protect spawning and nest guarding fish—the sport and commercial season is closed from January 1 through June 30, (2) allow fish to spawn at least once before being subject for harvest—a 35 inch minimum size limit for both sport and commercial fisheries, and (3) restrictive catch limits—the sport fishery is currently restricted to a 2 fish daily, 4 fish in possession limit in areas of healthy stock status, in areas of less healthy stock status, the daily bag and possession limit is reduced. The commercial fishery is restricted by catch limits and bycatch quotas.

Ongoing Research and Management Activities

A research program aimed at estimating the age, sex, and length compositions of the recreational lingcod harvests from Central Gulf of Alaska waters has been annually conducted since 1987. Managers recommend continuation of this sampling program. In addition, a fishery-independent sampling program was implemented during 1993 to monitor the recruitment of depressed lingcod stocks in the Resurrection Bay area. With the implementation of minimum size limits, the ability to assess recruitment to these stocks was lost. Staff recommend that fishery-independent estimates of the age, sex, and size compositions of the lingcod stocks in Resurrection Bay be collected for the next 2-4 years.

Central Gulf Management Area Dolly Varden Fisheries

Dolly Varden are available to anglers throughout the year in the CGMA, however, peak fishing opportunities typically occur as the fish migrate to and from overwintering and spawning areas. Peak harvest typically occurs in May and from mid-July through September. Spawning begins in September and lasts into November.

All streams in the CGMA are open year-long to fishing for Dolly Varden. The daily bag and possession limit for PWS is 10 Dolly Varden with no size limit and for Resurrection Bay the bag and possession limit is 5 fish.

Resurrection Bay supports a limited sport fishery for Dolly Varden. The average harvest has been 1,632 fish for 1983 through 1992. The majority of the harvest has occurred in the marine waters by anglers using private boats and by shoreline anglers (Table 24 and Figure 24).

Sport fisheries for Dolly Varden in PWS have accounted for an average of about three-quarters of the CGMA total Dolly Varden harvest or about 5,000 fish. Within PWS, significant fisheries for Dolly Varden include Valdez Arm area and the Cordova roadside streams (Table 25, Figure 25). The major producer in the Valdez Arm area was historically the Robe River, however changes in the overwintering habitat in Robe Lake has reduced this harvest from approximately 5,000 fish in the early 1980s to about 1,500 during the last 5 years. The saltwater harvest in Valdez Arm is the dominate producer in recent years (Table 26, Figure 26). Along the Cordova road system the Eyak River drainage is the major producer, with a very popular local fishery at Power Creek (Table 27, Figure 27).

Recent Fishery Performance

The historical trends discussed above continued in 1993 (Tables 24-27 and Figures 24-27).

Table 24.-Sport harvests of Dolly Varden in Resurrection Bay, 1983-1993.

| YEAR | Freshwater | Saltwater Boat | Saltwater Shore | Saltwater Private (B+S) | Saltwater Charter | Grand Total |
|---------------------|------------|----------------|-----------------|-------------------------|-------------------|-------------|
| 1983 | 1,909 | 5,811 | 0 | 5,811 | 0 | 7,720 |
| 1984 | 137 | 1,771 | 0 | 1,771 | 0 | 1,908 |
| 1985 | 433 | 191 | 225 | 416 | 0 | 849 |
| 1986 | 0 | 505 | 566 | 811 | 260 | 1,071 |
| 1987 | 0 | 453 | 471 | 815 | 109 | 924 |
| 1988 | 0 | 473 | 255 | 692 | 36 | 728 |
| 1989 | 96 | 721 | 764 | 1,382 | 103 | 1,581 |
| 1990 | 73 | 115 | 113 | 134 | 94 | 301 |
| 1991 | 39 | 356 | 246 | 505 | 97 | 641 |
| 1992 | 221 | 180 | 196 | 352 | 24 | 597 |
| 1993 | 87 | 775 | 125 | 579 | 321 | 987 |
| 1983-1992 | | | | | | |
| MEAN | 291 | 1,058 | 284 | 1,269 | 72 | 1,632 |
| % CHANGE of 1993 | -70% | -27% | -56% | -54% | 344% | -40% |
| FROM MEAN | | | | | | |

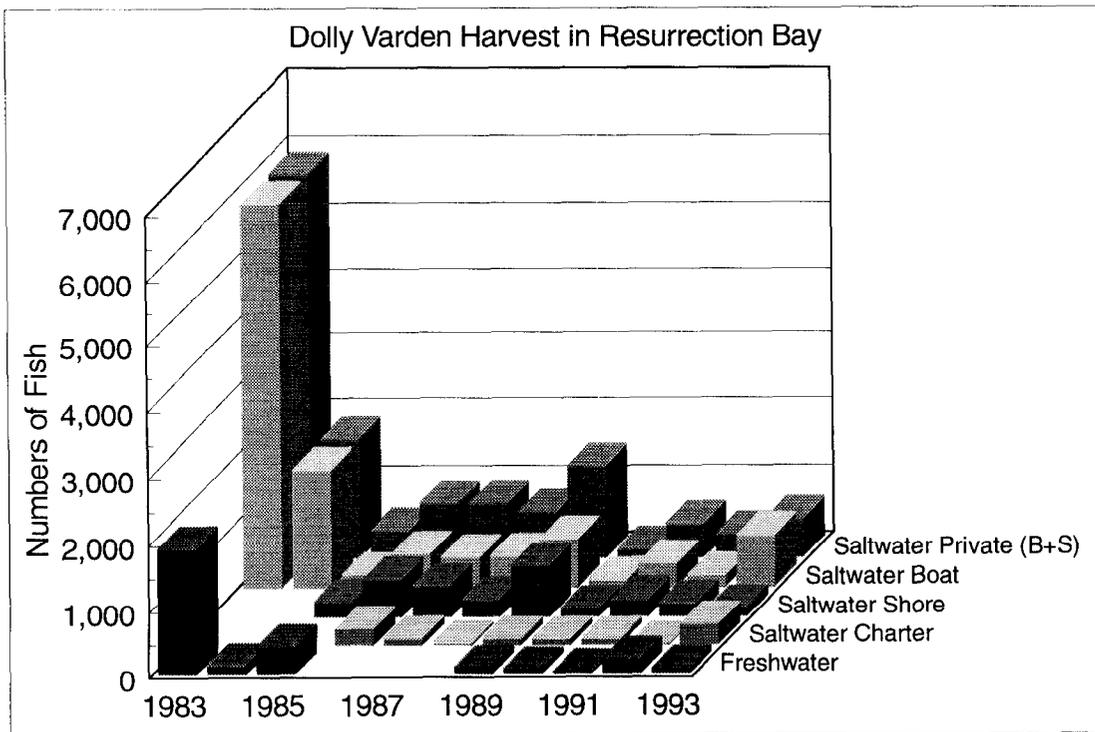


Figure 24.-Sport harvests of Dolly Varden in Resurrection Bay, 1983-1993.

Table 25.-Sport harvest of Dolly Varden in Prince William Sound, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Southwest PWS | Valdez Arm Area | Grand Total |
|------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|---------------|-----------------|-------------|
| YEAR | OI | CR | DT | EA | NE | NW | OT | SW | VZ | Grand Total |
| 1983 | 0 | 2,632 | 73 | 0 | 0 | 293 | 660 | 63 | 976 | 4,697 |
| 1984 | 236 | 1,245 | 137 | 0 | 0 | 299 | 137 | 87 | 9,566 | 11,707 |
| 1985 | 0 | 714 | 69 | 0 | 0 | 69 | 832 | 17 | 4,803 | 6,504 |
| 1986 | 92 | 902 | 108 | 46 | 0 | 688 | 214 | 92 | 5,077 | 7,219 |
| 1987 | 0 | 1,268 | 688 | 0 | 0 | 1,593 | 0 | 0 | 1,049 | 4,598 |
| 1988 | 0 | 1,309 | 164 | 0 | 0 | 73 | 36 | 54 | 983 | 2,619 |
| 1989 | 87 | 1,888 | 106 | 542 | 0 | 388 | 145 | 39 | 1,141 | 4,336 |
| 1990 | 32 | 670 | 82 | 0 | 0 | 262 | 311 | 0 | 1,341 | 2,698 |
| 1991 | 0 | 997 | 661 | 27 | 40 | 40 | 135 | 13 | 1,441 | 3,354 |
| 1992 | 99 | 1,138 | 41 | 66 | 16 | 89 | 270 | 41 | 1,622 | 3,382 |
| 1993 | 10 | 586 | 48 | 0 | 10 | 213 | 386 | 102 | 1,801 | 3,156 |
| 1983-1992 | | | | | | | | | | |
| MEAN | 55 | 1,276 | 213 | 68 | 6 | 379 | 274 | 41 | 2,800 | 5,111 |
| % CHANGE of 1993 | -82% | -54% | -77% | -100% | 79% | -44% | 41% | 151% | -36% | -38% |
| FROM MEAN | | | | | | | | | | |

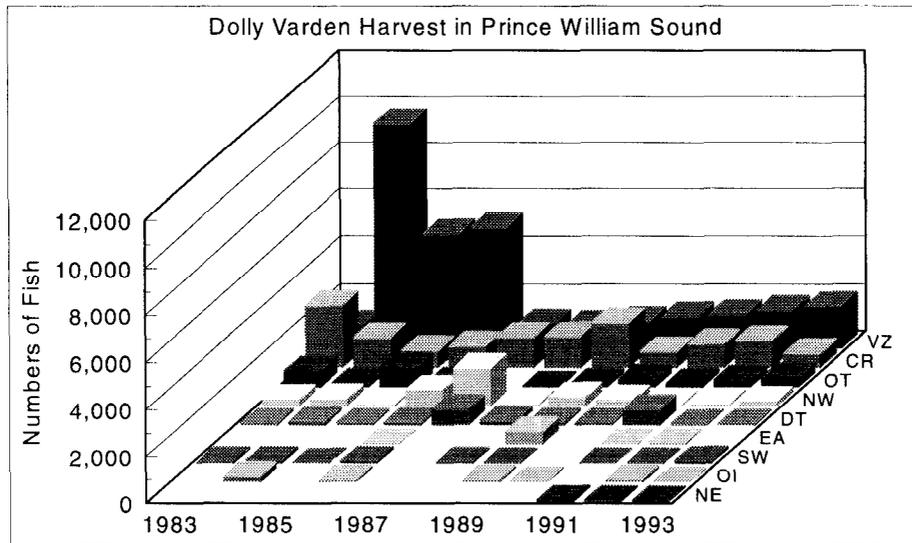


Figure 25.-Sport harvest of Dolly Varden in Prince William Sound, 1983-1993.

Table 26.-Sport harvest of Dolly Varden in the Valdez area of Prince William Sound, 1983-1993.

| YEAR | Saltwater | Lowe River | Robe Lake | Robe River | Other Freshwater | Grand Total |
|----------------------------------|-----------|------------|-----------|------------|------------------|-------------|
| 1983 | 262 | 315 | 84 | 315 | 0 | 976 |
| 1984 | 811 | 1,235 | 599 | 5,499 | 1,422 | 9,566 |
| 1985 | 1,300 | 139 | 121 | 3,104 | 139 | 4,803 |
| 1986 | 276 | 0 | 306 | 4,449 | 46 | 5,077 |
| 1987 | 434 | 36 | 0 | 525 | 54 | 1,049 |
| 1988 | 346 | 0 | 91 | 364 | 182 | 983 |
| 1989 | 735 | 0 | 97 | 290 | 19 | 1,141 |
| 1990 | 1,112 | 0 | 0 | 98 | 131 | 1,341 |
| 1991 | 956 | 94 | 0 | 391 | 0 | 1,441 |
| 1992 | 925 | 107 | 0 | 590 | 0 | 1,622 |
| 1993 | 1,256 | 68 | 0 | 370 | 107 | 1,801 |
| 1983-1992 | | | | | | |
| MEAN | 716 | 193 | 130 | 1,563 | 199 | 2,800 |
| % CHANGE of 1993 FROM MEAN | 75% | -65% | -100% | -76% | -46% | -36% |

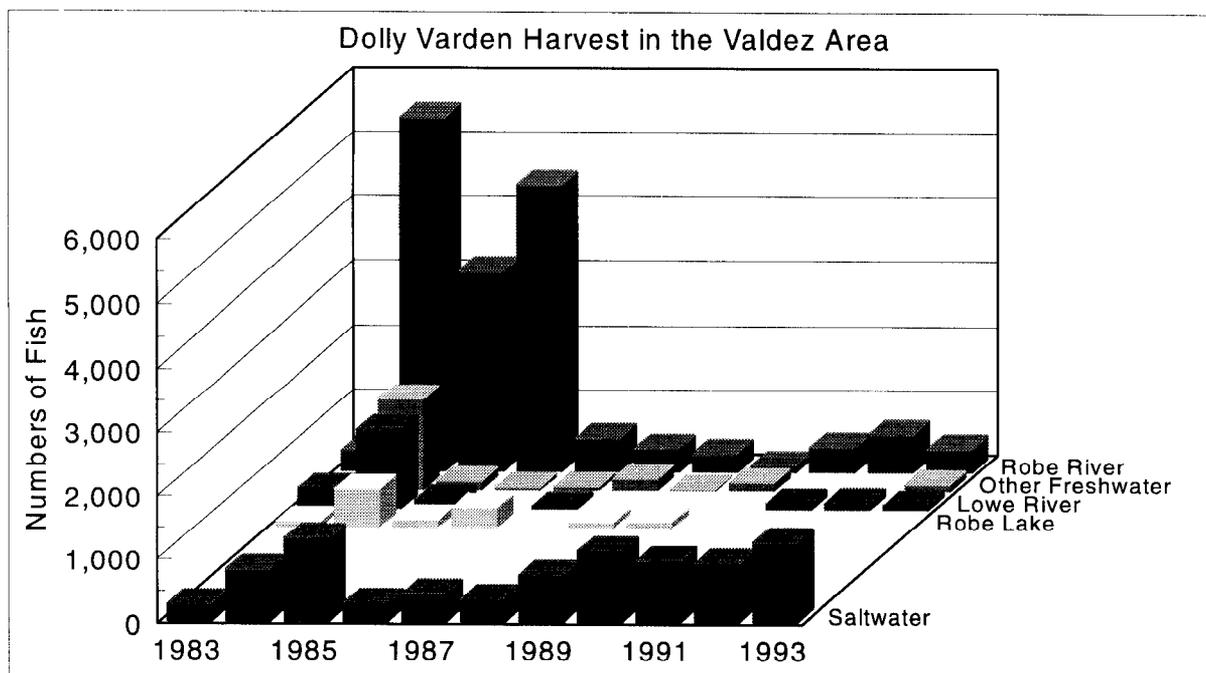


Figure 26.-Sport harvest of Dolly Varden in the Valdez area of Prince William Sound, 1983-1993.

Table 27.-Sport harvest of Dolly Varden in the Cordova area of Prince William Sound, 1983-1993.

| YEAR | Alaganik Slough | Clear Creek | Eyak Drainage ^a | Orca Inlet | Other Sites | Grand Total |
|-----------|-----------------|-------------|----------------------------|------------|-------------|-------------|
| 1983 | 63 | 157 | 2,140 | 0 | 272 | 2,632 |
| 1984 | 37 | 62 | 935 | 75 | 136 | 1,245 |
| 1985 | 0 | 52 | 575 | 35 | 52 | 714 |
| 1986 | 15 | 0 | 642 | 138 | 107 | 902 |
| 1987 | 0 | 272 | 290 | 706 | 0 | 1,268 |
| 1988 | 73 | 0 | 872 | 364 | 0 | 1,309 |
| 1989 | 68 | 136 | 1,123 | 368 | 193 | 1,888 |
| 1990 | 0 | 147 | 474 | 0 | 49 | 670 |
| 1991 | 108 | 175 | 512 | 202 | 0 | 997 |
| 1992 | 262 | 98 | 434 | 246 | 98 | 1,138 |
| 1993 | 86 | 57 | 346 | 9 | 88 | 586 |
| 1983-1992 | | | | | | |
| MEAN | 63 | 110 | 800 | 213 | 91 | 1,276 |
| % CHANGE | | | | | | |
| of 1993 | 37% | -48% | -57% | -96% | -3% | -54% |
| FROM MEAN | | | | | | |

^a Eyak drainage includes Eyak Lake, Eyak River and Power Creek.

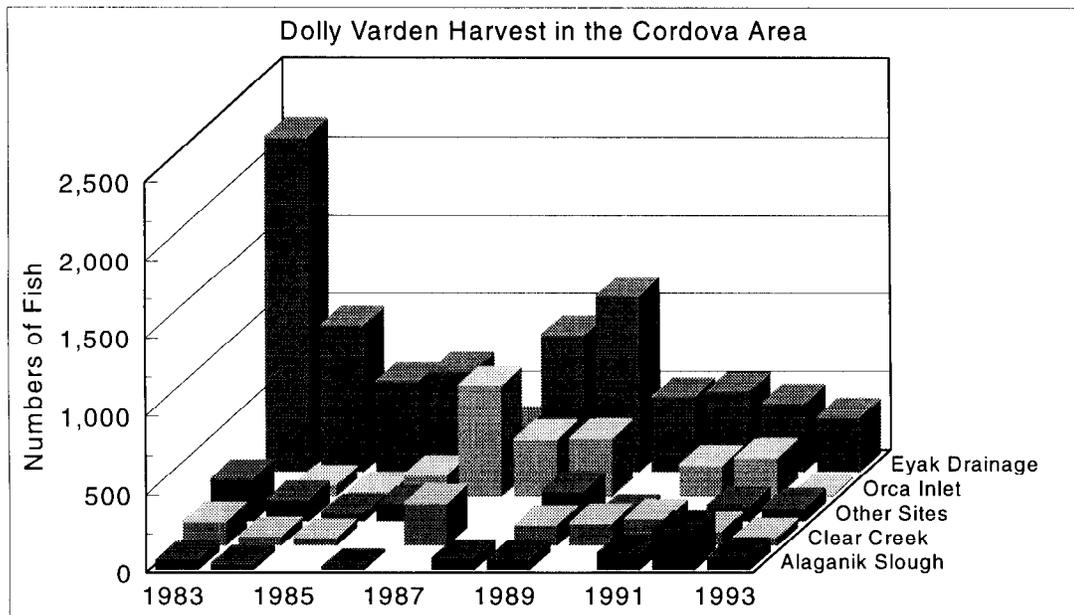


Figure 27.-Sport harvest of Dolly Varden in the Cordova area of Prince William Sound, 1983-1993.

Management Objective

No specific fishery objectives have been formally established for CGMA Dolly Varden fisheries to date. An assumption of past and current fisheries management, however, has been to assure for the sustained yield of the various Dolly Varden stocks that occur within the CGMA while assuring for continued and, where possible, expanded opportunity to participate in fisheries targeting these stocks.

Recent Board of Fisheries Actions

During the 1991 Board meeting, the PWS bag and possession limit for Dolly Varden was reduced from a daily bag and possession limit of 15 fish per day and 30 in possession to 10 fish daily and in possession.

Current Issues

The major concern for Dolly Varden in the CGMA is the rapidly declining harvest in the freshwater drainages of Valdez Arm. In 1984, the freshwater drainages of Valdez Arm supported a harvest of 9,566 Dolly Varden and by 1988 the harvest had declined to 983 fish (Table 26 and Figure 26) and has remained in the 1,000 to 1,500 fish range. There are limited data on Dolly Varden stocks in the Valdez area but it is assumed that Robe Lake is the major overwintering site for various spawning stocks in the Valdez Arm since it is the only large lake in the area. The Robe River drainage supported the largest harvest of Dolly Varden in the CGMA in the mid-1980s but only accounted for slightly over 3% of the CGMA harvest by 1990. It is hypothesized that the reason for the decline in harvest is that Robe Lake is rapidly becoming an eutrophic lake which is leading to a degradation of critical overwintering habitat.

Another area of concern regarding PWS Dolly Varden stocks is the proposed hydroelectric project on Power Creek near Cordova. As mentioned earlier this is a very popular fishery among the local anglers, especially children. Studies are being conducted to determine what the potential impacts may be if the project is constructed.

Ongoing Research and Management Activities

There are no ongoing department research projects for this fishery.

Recommended Research and Management Activities

Sport fish staff will continue to assist in assessment work currently being conducted on Power Creek. In addition, a detailed project description (DPD) will be prepared for FY97 for potential habitat evaluation and restoration in the Valdez area.

OTHER CENTRAL GULF MANAGEMENT AREA FISHERIES

Several smaller fisheries for other species also occur in the CGMA. These include fisheries for stocked Arctic grayling and rainbow trout, chum salmon, clams, and shellfish. Because these fisheries are generally small, little specific management or research is directed towards them nor have specific management or fishery objectives been set for the fisheries. A brief summary of these fisheries is provided below.

Chum Salmon

Chum salmon have not historically been targeted by recreational anglers in the CGMA, however, some have been taken incidental to other salmon species. In recent years returns of hatchery runs to the hatchery on Ester Island have been targeted. An average of 4,155 chum salmon have been

harvested by sport anglers from CGMA waters from 1983 through 1992 (Table 28 and Figure 28). Most (60%) of the annual chum salmon harvest from CGMA has occurred in PWS. Since 1983, an average of 65% of the chum harvest in PWS occurred at Valdez (Table 28 and Figure 28). Anglers have harvested an average of 1,700 chum salmon from Resurrection Bay from 1983 through 1992 (Table 28 and Figure 28) with the majority of the harvest from shoreline anglers.

Arctic Grayling and Rainbow Trout

There are no indigenous stocks of rainbow trout or Arctic grayling in the CGMA but these fish have been stocked in landlocked lakes near Valdez and Cordova in PWS to diversify opportunities for sport anglers.

Regulations governing the stocked lakes vary by species. The limit for rainbow trout is 5 fish per day and 10 in possession, only 1 per day and 2 in possession over 20 inches. Daily bag and possession limits for Arctic grayling are 10 fish with no size limits.

Arctic grayling have been stocked in as many as eight lakes along the Copper River Highway between Cordova and the Million Dollar Bridge since 1984, and in Thompson Lake near Valdez. The average harvest of Arctic grayling from 1985 through 1992 has been 188 fish and has ranged from a low of 52 fish in 1985 to a high of 497 in 1991 (Table 29 and Figure 29). Only 283 Arctic grayling were harvested in 1993. The stocking of grayling in the Copper River Highway lakes has been reduced in recent years and only one lake, Sheridan Dike Pond #2, will be stocked in 1995. Thompson Lake near Valdez will continue to be stocked.

The average harvest of rainbow trout from stocked lakes from 1983 through 1992 was 451 fish (Table 30 and Figure 30). The majority of this harvest was from Ruth, Blueberry, and Worthington lakes located near Valdez. Ruth Lake has been the only lake stocked with catchable sized rainbows, however Blueberry and Thompson will begin receiving catchable size fish in 1995. The remaining lake in PWS (Crater Lake) has been stocked with rainbow trout fingerlings (Table 4).

Eulachon (Smelt)

A small number of eulachon return to CGMA streams. The Resurrection Bay area produces the greatest harvest with an average of 2,427 fish being harvested; this accounts for 50% of the CGMA area harvest. Other harvests occur along the Copper River Highway and in the Valdez Arm area (Table 31 and Figure 31).

Clams and Shellfish

Limited fisheries occur for shellfish in the CGMA. Crab fisheries have been closed during recent years in all fisheries in much of the area. Limited harvests occur on shrimp and crab species in western PWS and in Resurrection Bay (Table 32 and Figure 32). Razor clams were at one time commercially harvested in the Cordova area, however environmental changes resulting from the 1964 earthquake have drastically reduced the razor clam populations. Razor clams can now only be harvested in a personal use fishery with permits being issued in Cordova. A small number of razor clams are harvested in the Resurrection Bay area (less than 10% of the total harvest). From 1983 through 1992, the average harvest of clams was about 11,500. The majority of the PWS harvest is taken in the eastern sound primarily along the Cordova road system and in the Copper River Delta (Table 33 and Figure 33).

Table 28.-Sport harvest of chum salmon in the Central Gulf Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 84 | 0 | 0 | 0 | 31 | 262 | 923 | 0 | 976 | 2,276 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 49 | 461 | 2,644 | 0 | 1,397 | 4,551 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 228 | 0 | 820 | 0 | 1,400 | 2,448 |
| 1986 | 15 | 15 | 0 | 31 | 0 | 749 | 183 | 1,958 | 0 | 1,865 | 4,816 |
| 1987 | 0 | 0 | 10 | 0 | 0 | 359 | 0 | 1,974 | 0 | 1,525 | 3,868 |
| 1988 | 73 | 236 | 0 | 54 | 0 | 1,818 | 728 | 3,947 | 127 | 4,201 | 11,184 |
| 1989 | 36 | 64 | 0 | 0 | 0 | 257 | 74 | 1,696 | 468 | 2,736 | 5,331 |
| 1990 | 113 | 45 | 0 | 0 | 57 | 236 | 147 | 427 | 89 | 1,258 | 2,372 |
| 1991 | 8 | 143 | 0 | 364 | 0 | 229 | 0 | 796 | 40 | 838 | 2,418 |
| 1992 | 0 | 38 | 0 | 8 | 8 | 91 | 15 | 1,321 | 0 | 804 | 2,285 |
| 1993 | 0 | 170 | 0 | 46 | 0 | 686 | 216 | 680 | 27 | 873 | 2,698 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 25 | 63 | 1 | 46 | 7 | 405 | 187 | 1,651 | 72 | 1,700 | 4,155 |
| % CHANGE of 1993 FROM MEAN | -100% | 172% | -100% | 1% | -100% | 70% | 16% | -59% | -63% | -49% | -35% |

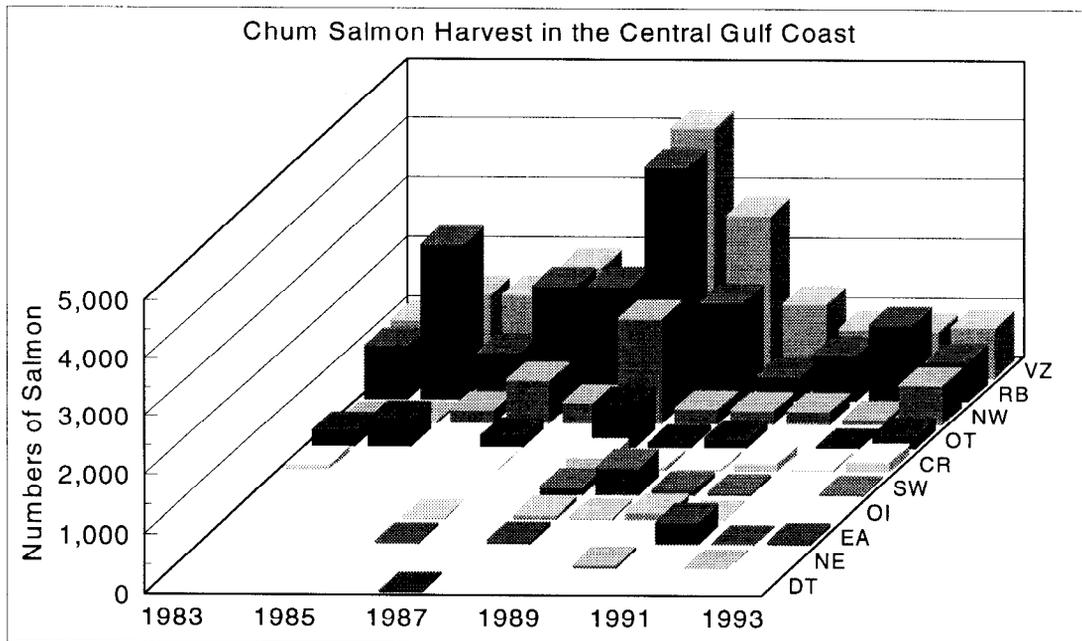


Figure 28.-Sport harvest of chum salmon in the Central Gulf Area, 1983-1993.

Table 29.-Sport harvest of Arctic grayling in the Central Gulf Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| YEAR | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 52 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 352 | 352 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54 | 54 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 182 | 182 |
| 1989 | 0 | 116 | 0 | 194 | 0 | 0 | 0 | 0 | 0 | 58 | 368 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 180 | 0 | 0 | 114 | 294 |
| 1991 | 0 | 0 | 0 | 0 | 0 | 0 | 166 | 0 | 0 | 331 | 497 |
| 1992 | 0 | 16 | 0 | 15 | 0 | 0 | 46 | 0 | 0 | 0 | 77 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 249 | 283 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 0 | 13 | 0 | 21 | 0 | 0 | 44 | 0 | 0 | 109 | 188 |
| % CHANGE of 1993 FROM MEAN | | -100% | | -100% | | | -23% | | | 128% | 51% |

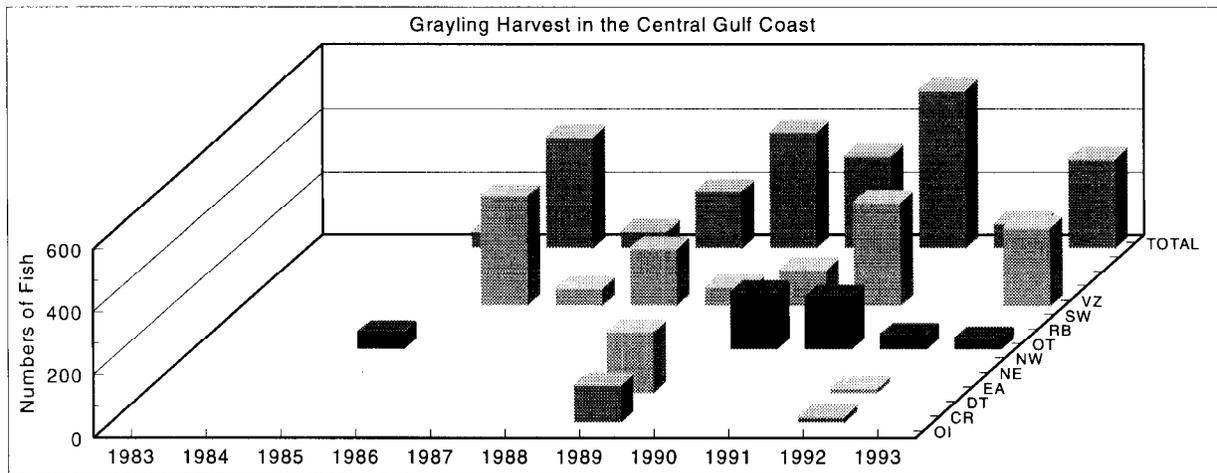


Figure 29.-Sport harvest of Arctic grayling in the Central Gulf Area, 1983-1993.

Table 30.-Sport harvest of rainbow trout in the Central Gulf Area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| YEAR | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 31 | 0 | 210 | 0 | 0 | 0 | 42 | 944 | 0 | 1,227 |
| 1984 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 499 | 548 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | 173 | 0 | 87 | 450 |
| 1986 | 0 | 15 | 0 | 0 | 0 | 46 | 31 | 31 | 0 | 15 | 138 |
| 1987 | 0 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 126 |
| 1988 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 109 |
| 1989 | 0 | 271 | 77 | 0 | 0 | 0 | 155 | 0 | 0 | 174 | 677 |
| 1990 | 0 | 82 | 16 | 16 | 0 | 0 | 16 | 0 | 0 | 262 | 392 |
| 1991 | 0 | 29 | 292 | 73 | 0 | 0 | 58 | 0 | 0 | 88 | 540 |
| 1992 | 32 | 95 | 32 | 0 | 0 | 0 | 56 | 16 | 0 | 71 | 302 |
| 1993 | 0 | 79 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 37 | 136 |
| 1983-1992 | | | | | | | | | | | |
| MEAN | 3 | 57 | 47 | 30 | 0 | 5 | 51 | 29 | 94 | 136 | 451 |
| % CHANGE of 1993 FROM MEAN | -100% | 40% | -100% | -100% | | -100% | -60% | -100% | -100% | -73% | -70% |

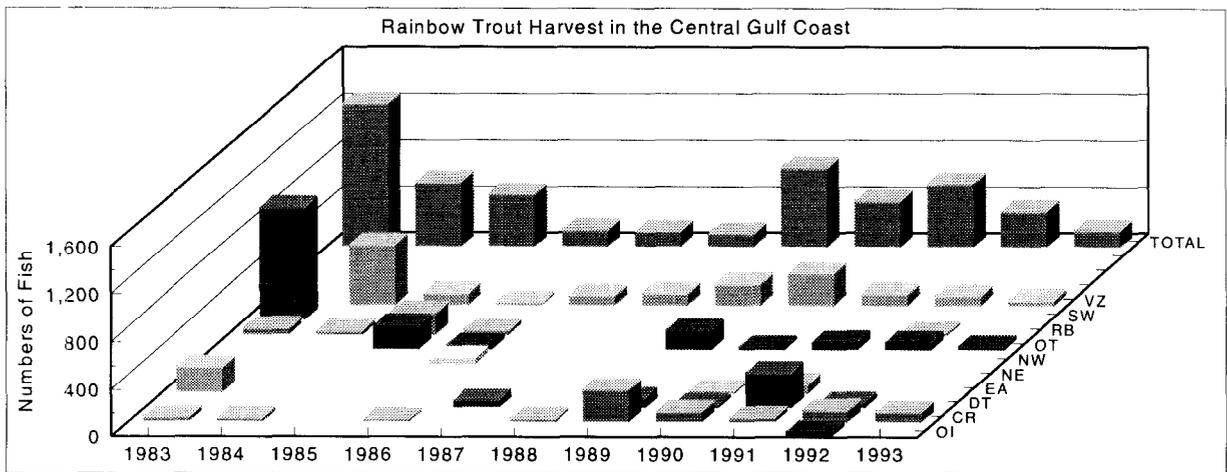


Figure 30.-Sport harvest of rainbow trout in the Central Gulf Area, 1983-1993.

Table 31.-Sport harvest of eulachon in the Central Gulf Area, 1983-1993.

| YEAR | Ouer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Northwest PWS | Other sites in PWS | Resurrection Bay | Southwest PWS | Valdez Arm Area | Grand Total |
|----------------------------|--------------|---------------------|--------------------|-------------|---------------|---------------|--------------------|------------------|---------------|-----------------|-------------|
| | OI | CR | DT | EA | NE | NW | OT | RB | SW | VZ | |
| 1983 | 0 | 3,672 | 0 | 0 | 0 | 0 | 4,721 | 3,672 | 0 | 0 | 12,065 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 0 | 1,871 | 9,980 | 0 | 499 | 12,350 |
| 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 730 | 0 | 15 | 745 |
| 1987 | 0 | 0 | 0 | 0 | 0 | 1,908 | 0 | 31 | 0 | 0 | 1,939 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | 0 | 3,713 | 3,806 |
| 1989 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 1,694 | 0 | 0 | 1,758 |
| 1990 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,752 | 0 | 3,386 | 7,138 |
| 1991 | 0 | 63 | 0 | 210 | 0 | 0 | 0 | 563 | 0 | 0 | 836 |
| 1992 | 1,623 | 2,077 | 0 | 11 | 0 | 0 | 0 | 3,753 | 33 | 379 | 7,876 |
| 1993 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 0 | 1,453 | 1,520 |
| 1983-1992 MEAN | 169 | 581 | 0 | 22 | 0 | 191 | 659 | 2,427 | 3 | 799 | 4,851 |
| % CHANGE of 1993 FROM MEAN | -100% | -100% | | -100% | | -100% | -100% | -97% | -100% | 82% | -69% |

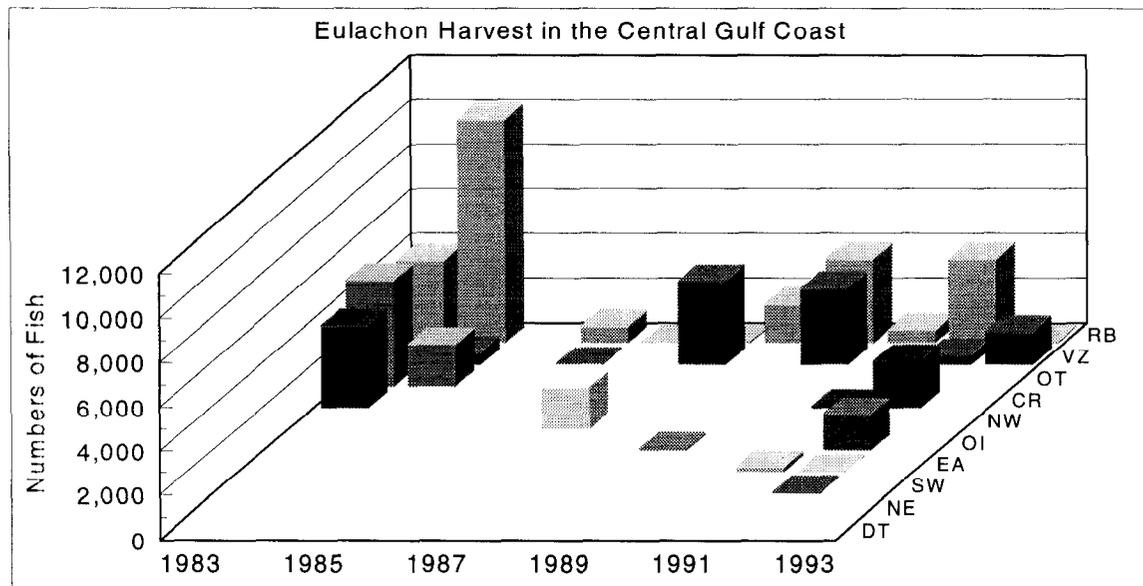


Figure 31.-Sport harvest of eulachon in the Central Gulf Area, 1983-1993.

Table 32.-Sport harvests of shellfish in the Resurrection Bay area, 1983-1993.

| YEAR | Dungeness Crab | Tanner Crab | King Crab | Hardshell Clams | Shrimp | Razor Clams | Other Clams |
|---------------------|----------------|-------------|-----------|-----------------|--------|-------------|-------------|
| | RB | RB | RB | RB | RB | RB | RB |
| 1983 | 0 | 2,098 | 52 | 336 | 63 | 0 | 21 |
| 1984 | 12 | 0 | 12 | 7,432 | 50 | 0 | 0 |
| 1985 | 1,127 | 35 | 0 | 69 | 0 | 0 | 0 |
| 1986 | 205 | 26 | 0 | 51 | 103 | 0 | 0 |
| 1987 | 616 | 185 | 0 | 0 | 92 | 0 | 0 |
| 1988 | 516 | 0 | 0 | 868 | 0 | 0 | 0 |
| 1989 | 257 | 0 | 0 | 14 | 14 | 0 | 0 |
| 1990 | 81 | 0 | 0 | 49 | 16 | 6,678 | 0 |
| 1991 | 0 | 0 | 0 | 228 | 0 | 328 | 0 |
| 1992 | 77 | 22 | 0 | 43 | 22 | 2,109 | 0 |
| 1993 | 22 | 0 | 0 | 118 | 63 | 3,136 | 0 |
| 1983-1992 | | | | | | | |
| MEAN | 289 | 237 | 6 | 909 | 36 | 912 | 2 |
| % CHANGE of 1993 | -92% | -100% | -100% | -87% | 75% | 244% | -100% |
| FROM MEAN | | | | | | | |

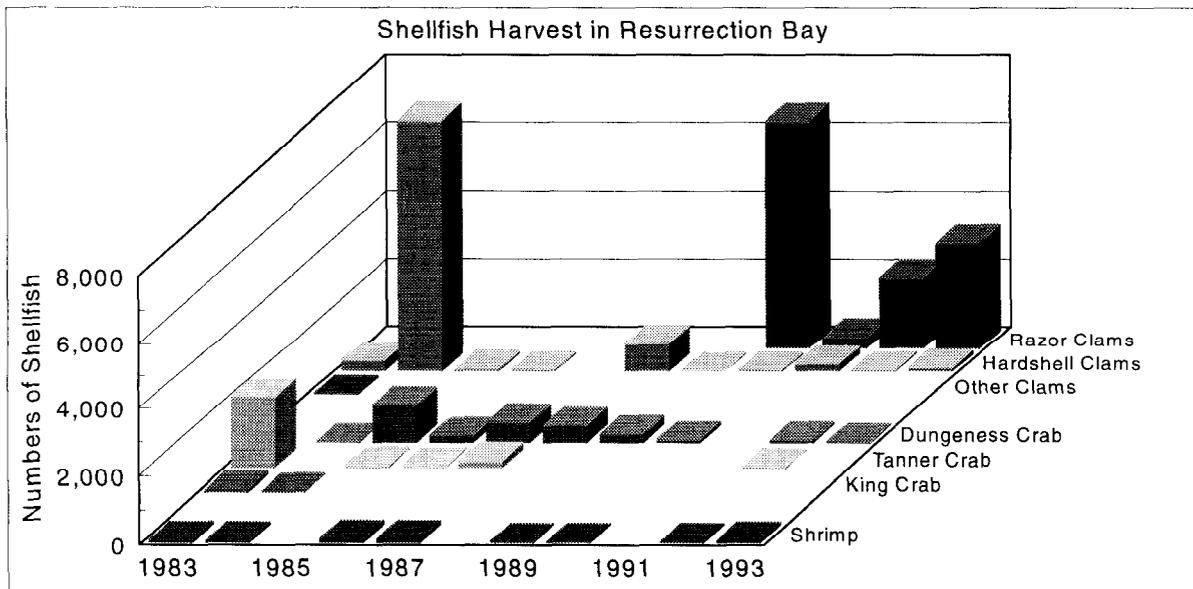


Figure 32.-Sport harvests of shellfish in the Resurrection Bay area, 1983-1993.

Table 33.-Sport harvests of razor clams in the Prince William Sound area, 1983-1993.

| YEAR | Outer Islands | Cordova Road System | Copper River Delta | Eastern PWS | Northeast PWS | Other Sites in PWS | Valdez Arm Area | Total |
|----------------------------|---------------|---------------------|--------------------|-------------|---------------|--------------------|-----------------|--------|
| | OI | CR | DT | EA | NE | OT | VZ | |
| 1983 | 0 | 0 | 0 | 0 | 0 | 16,640 | 0 | 16,640 |
| 1984 | 0 | 0 | 0 | 0 | 0 | 36,003 | 0 | 36,003 |
| 1985 | 0 | 1,680 | 0 | 0 | 0 | 0 | 0 | 1,680 |
| 1986 | 61 | 489 | 4,740 | 612 | 0 | 841 | 306 | 7,049 |
| 1987 | 0 | 9,234 | 0 | 0 | 0 | 0 | 154 | 9,388 |
| 1988 | 0 | 0 | 0 | 0 | 0 | 5,428 | 27 | 5,455 |
| 1989 | 0 | 0 | 3,988 | 0 | 0 | 191 | 64 | 4,243 |
| 1990 | 0 | 0 | 4,908 | 0 | 0 | 327 | 0 | 5,235 |
| 1991 | 0 | 769 | 1,923 | 0 | 0 | 0 | 0 | 2,692 |
| 1992 | 108 | 2,347 | 22,013 | 0 | 433 | 292 | 1,114 | 26,307 |
| 1993 | 0 | 2,020 | 3,491 | 1,118 | 0 | 0 | 0 | 6,629 |
| 1983-1992 | | | | | | | | |
| MEAN | 17 | 1,452 | 3,757 | 61 | 43 | 5,972 | 167 | 11,469 |
| % CHANGE of 1993 FROM MEAN | -100% | 39% | -7% | 1,727% | -100% | -100% | -100% | -42% |

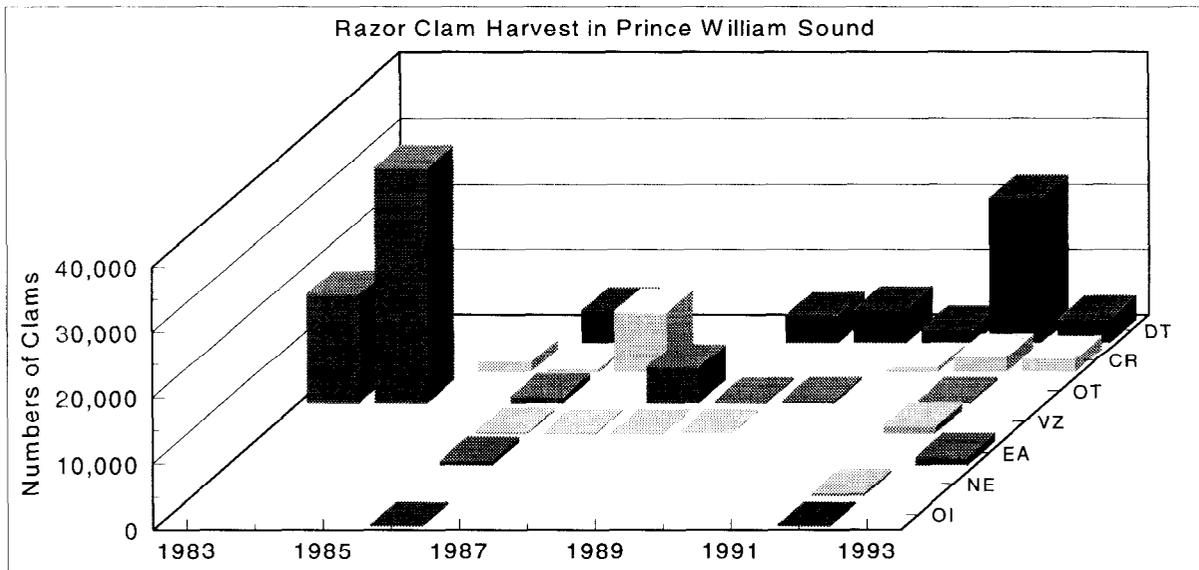


Figure 33.-Sport harvests of razor clams in the Prince William Sound area, 1983-1993.

Management Objective

No specific fishery objectives have been formally established for these fisheries to date. An assumption of past and current fisheries management, however, has been to maximize the opportunity to fish for hatchery supported stocks of fish that occur along the Valdez and Cordova road systems.

Recent Board of Fisheries Actions

In 1991, the Board of Fisheries reduced the limit for Arctic grayling from 15 fish per day and 30 fish in possession to 10 fish per day and in possession for all PWS waters. This action brought the PWS regulatory area in conformity with the surrounding regulatory areas.

Current Issues

There has been concern voiced by the department in recent years about the strength of the crab populations in Resurrection Bay waters. The department has placed restrictions on fisheries targeting those stocks in response to this concern including a complete closure of the king crab fishery. Surveys conducted during the winter of 1992 have identified several strong year classes of Tanner crab and the population is expected to remain strong in subsequent years. A single strong year class of Dungeness crab which has gone through two mating seasons has been identified. While survey techniques have been unsuccessful in identifying the strength of younger year classes of Dungeness crab, there is a harvestable surplus of this single year class. Survey results also indicate that many of the crab remain in a soft shelled condition longer than previously thought prompting a mid-April to mid-July closure to protect crab in this condition. Careful handling of the nonlegal segment of the catch should aide in assuring that these populations continue to increase. King crab stocks remain depressed so this fishery will remain closed until further notice.

Additionally, there is some concern on how accurate the harvest reporting is from the personal use and sport fish shellfish fisheries. The Homer Fish and Game Advisory Committee has submitted a proposal for BOF consideration that would require all personal use or sport fish participants in shellfish fisheries in Lower Cook Inlet (includes Resurrection Bay and outer gulf coast) to obtain a permit for recording harvest. The department has not finalized a position on this proposal yet but area staff in Homer are supportive.

Ongoing Research and Management Activities

There are no major research or management activities regarding these fisheries at present.

Recommended Research and Management Activities

Greater education of the fishing public is recommended to increase utilization of stocked fish. The staff will submit a proposal to the Board of Fisheries that recommends that all users regardless of whether they are personal use, sport, or commercial, use the same type gear for shrimp and Dungeness pots. No other specific research or management activities are recommended for this fishery at present.

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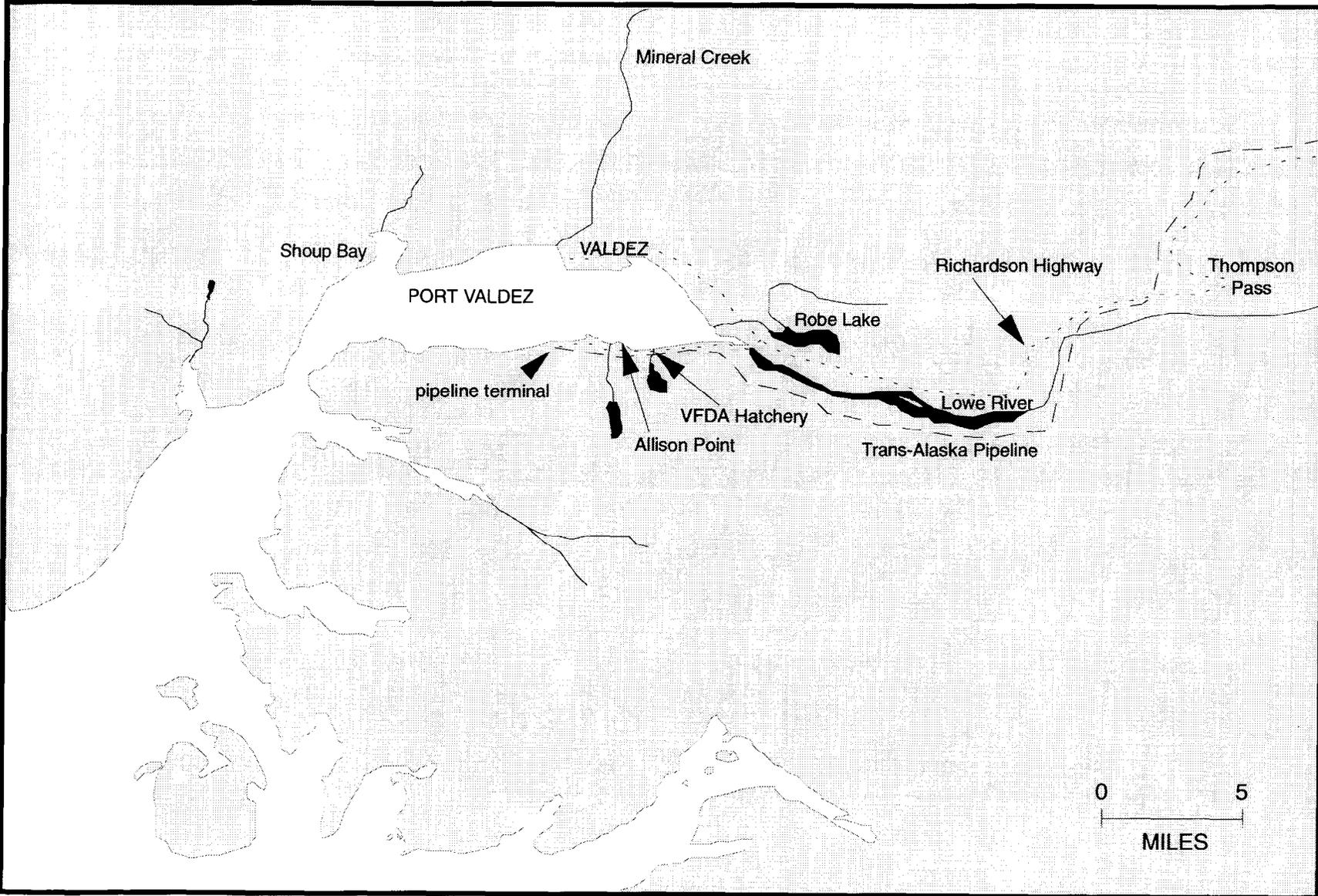
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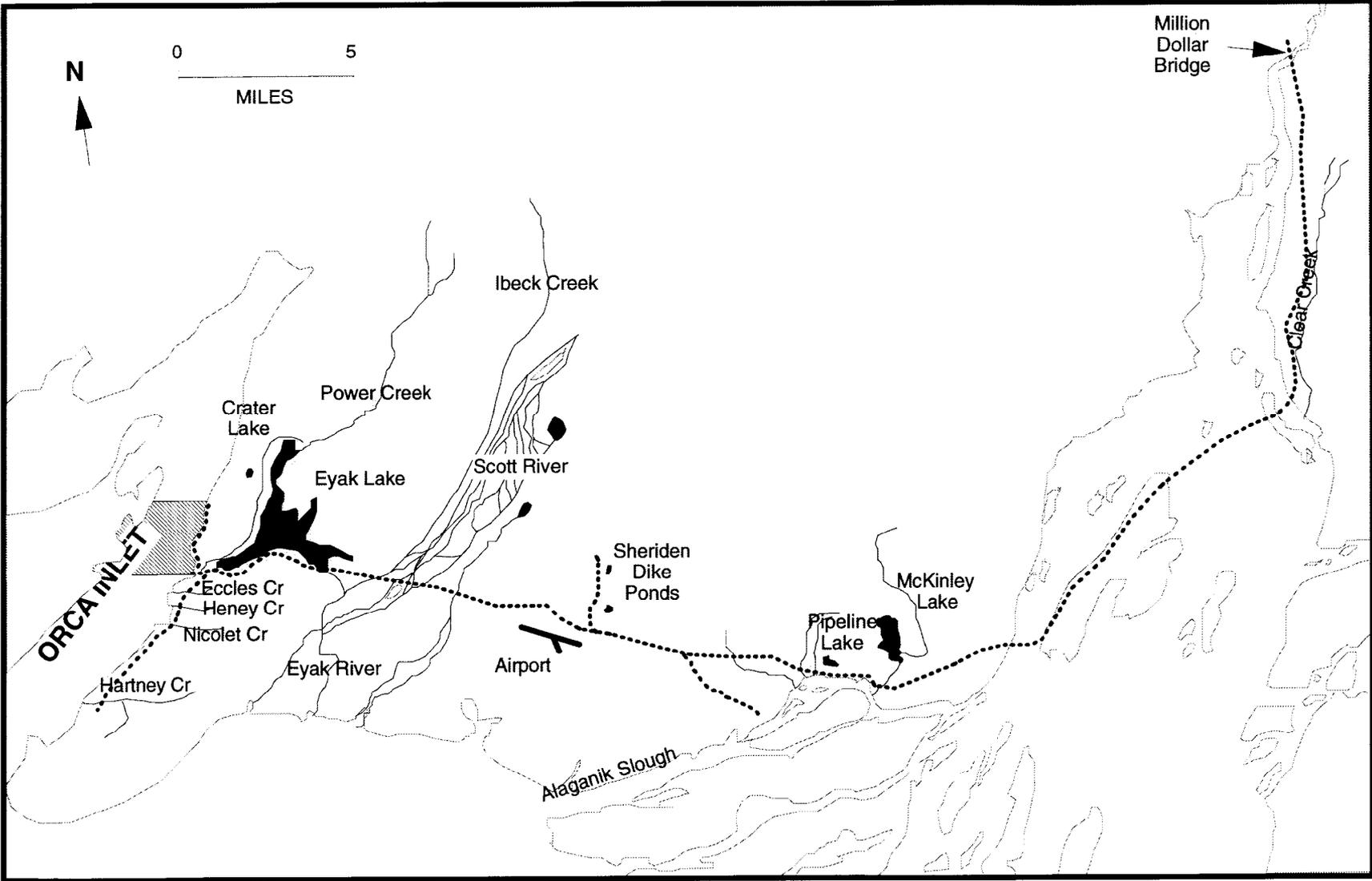
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APPENDIX A

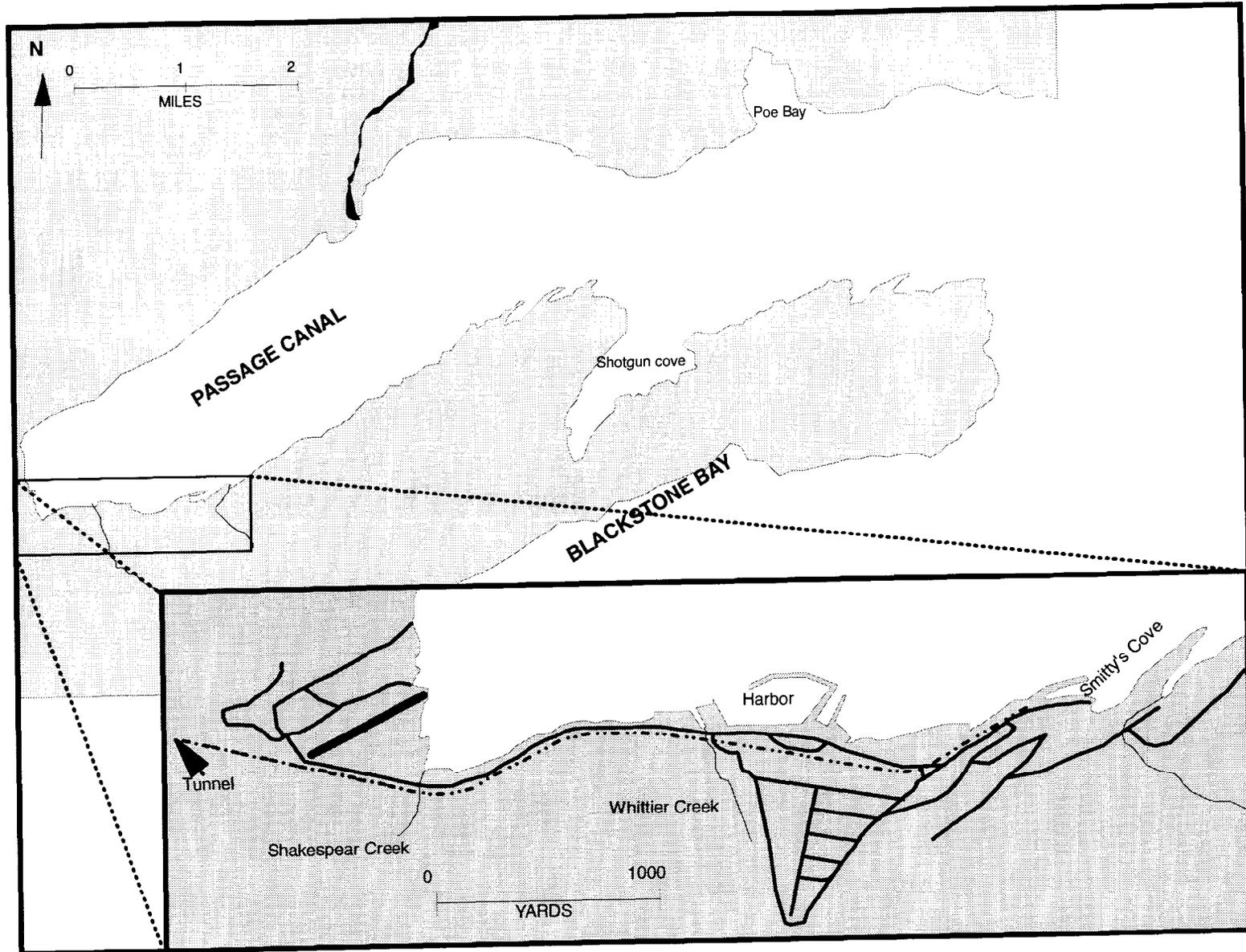
Appendix A1.-Map of the Valdez area.



Appendix A2.-Map of the Cordova area.



Appendix A3.-Map of the Whittier area.



Appendix A4.-Map of the Seward area.

