

**Fishery Management Report No. 11-47**

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**Annual Management Report for Pacific Cod  
Fisheries in the Prince William Sound and Cook  
Inlet Management Areas, 2010**

by

**Charles E. Trowbridge,**

**Elisa Russ,**

**and**

**Chris Russ**

September 2011

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



## Symbols and Abbreviations

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|   |                    |  |   |   |                         |
|---|--------------------|--|---|---|-------------------------|
| <b>Weights and measures (metric)</b>    |                    | <b>General</b>                                   |   | <b>Measures (fisheries)</b>   |                         |
| centimeter                              | cm                 | Alaska Administrative Code                       | AAC   | fork length   | FL                      |
| deciliter                               | dL                 | all commonly accepted abbreviations              | e.g., Mr., Mrs., AM, PM, etc.               | mid-eye to fork   | MEF                     |
| gram                                    | g                  | all commonly accepted professional titles        | e.g., Dr., Ph.D., R.N., etc.                | mid-eye to tail fork  | METF                    |
| hectare                                 | ha                 | at   | @   | standard length   | SL                      |
| kilogram                                | kg                 | compass directions:                              |   | total length  | TL                      |
| kilometer                               | km                 | east   | E   |   |                         |
| liter                                   | L                  | north  | N   | <b>Mathematics, statistics</b>  |                         |
| meter                                   | m                  | south  | S   | <i>all standard mathematical signs, symbols and abbreviations</i>             |                         |
| milliliter                              | mL                 | west   | W   | alternate hypothesis  | H <sub>A</sub>          |
| millimeter                              | mm                 | copyright  | ©   | base of natural logarithm   | e                       |
|   |                    | corporate suffixes:                              |   | catch per unit effort   | CPUE                    |
| <b>Weights and measures (English)</b>   |                    | Company  | Co.   | coefficient of variation  | CV                      |
| cubic feet per second                   | ft <sup>3</sup> /s | Corporation                                      | Corp.                                       | common test statistics  | (F, t, $\chi^2$ , etc.) |
| foot                                    | ft                 | Incorporated                                     | Inc.  | confidence interval   | CI                      |
| gallon                                  | gal                | Limited  | Ltd.  | correlation coefficient (multiple)  | R                       |
| inch                                    | in                 | District of Columbia                             | D.C.  | correlation coefficient (simple)  | r                       |
| mile                                    | mi                 | et alii (and others)                             | et al.                                      | covariance  | cov                     |
| nautical mile                           | nmi                | et cetera (and so forth)                         | etc.  | degree (angular)  | °                       |
| ounce                                   | oz                 | exempli gratia (for example)                     | e.g.  | degrees of freedom  | df                      |
| pound                                   | lb                 | Federal Information Code                         | FIC   | expected value  | E                       |
| quart                                   | qt                 | id est (that is)                                 | i.e.  | greater than  | >                       |
| yard                                    | yd                 | latitude or longitude                            | lat. or long.                               | greater than or equal to  | ≥                       |
|   |                    | monetary symbols (U.S.)                          | \$, ¢                                       | harvest per unit effort   | HPUE                    |
| <b>Time and temperature</b>             |                    | months (tables and figures): first three letters | Jan,...,Dec                                 | less than   | <                       |
| day                                     | d                  | registered trademark                             | ®   | less than or equal to   | ≤                       |
| degrees Celsius                         | °C                 | trademark  | ™   | logarithm (natural)   | ln                      |
| degrees Fahrenheit                      | °F                 | United States (adjective)                        | U.S.  | logarithm (base 10)   | log                     |
| degrees kelvin                          | K                  | United States of America (noun)                  | USA   | logarithm (specify base)  | log <sub>2</sub> , etc. |
| hour                                    | h                  | U.S.C.   | United States Code                          | minute (angular)  | '                       |
| hour                                    | h                  | U.S. state                                       | use two-letter abbreviations (e.g., AK, WA) | not significant   | NS                      |
| minute                                  | min                |  |   | null hypothesis   | H <sub>0</sub>          |
| second                                  | s                  |  |   | percent   | %                       |
|   |                    |  |   | probability   | P                       |
| <b>Physics and chemistry</b>            |                    |  |   | probability of a type I error (rejection of the null hypothesis when true)    | $\alpha$                |
| all atomic symbols                      |                    |  |   | probability of a type II error (acceptance of the null hypothesis when false) | $\beta$                 |
| alternating current                     | AC                 |  |   | second (angular)  | "                       |
| ampere                                  | A                  |  |   | standard deviation  | SD                      |
| calorie                                 | cal                |  |   | standard error  | SE                      |
| direct current                          | DC                 |  |   | variance  |                         |
| hertz                                   | Hz                 |  |   | population  | Var                     |
| horsepower                              | hp                 |  |   | sample  | var                     |
| hydrogen ion activity (negative log of) | pH                 |  |   |   |                         |
| parts per million                       | ppm                |  |   |   |                         |
| parts per thousand                      | ppt, ‰             |  |   |   |                         |
| volts                                   | V                  |  |   |   |                         |
| watts                                   | W                  |  |   |   |                         |

***FISHERY MANAGEMENT REPORT NO. 11-47***

**ANNUAL MANAGEMENT REPORT FOR PACIFIC COD FISHERIES IN  
THE PRINCE WILLIAM SOUND AND COOK INLET MANAGEMENT  
AREAS, 2010**

by

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September 2011

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## ABSTRACT

The Alaska Department of Fish and Game (ADF&G) Division of Commercial Fisheries manages commercial groundfish fisheries, including Pacific cod, in the Prince William Sound (PWS) and Cook Inlet (CI) management areas within state (or territorial) waters, which are defined from shore to 3 nautical miles. Pacific cod *Gadus macrocephalus* in PWS and CI are managed by ADF&G during two seasons: a parallel season concurrent and accounted with the Central Gulf of Alaska (CGOA) season in adjacent federal waters and during a state-waters season for specific guideline harvest levels (GHL). This report summarizes effort and harvest from parallel and state-waters commercial Pacific cod fisheries in PWS and CI areas through 2010 and includes preliminary 2011 data through July 31. The 2010 and 2011 PWS Pacific cod state-waters season harvests of 825,226 lb and 1,594,590 lb, respectively, are the two highest since the fishery began in 1997. The PWS GHLs have been achieved from 2009 to 2011, for the first time since the fishery began, due to the addition of longline as a legal gear type for the fishery in 2009. The 2010 and 2011 CI Pacific cod state-waters season harvests of 3,123,626 lb and 3,987,659 lb, respectively, also represent the two highest harvests since the fishery began in 1997, due in part to the 2011 GHL also being the highest since the fishery began. The 2011 CI state-waters fishery is ongoing; pot gear has achieved its allocation, but jig gear has not, although the jig harvest to date is the second highest since the fishery began and a ten-fold increase from the 2010 jig harvest. The combined fishery value for the parallel and state-waters seasons for 2010 were approximately \$256,000 for PWS and \$1,000,000 for CI. Regulatory changes, management actions, and a summary of fishery information are provided in this report.

Key words: Prince William Sound, Registration Area E, Cook Inlet, Registration Area H, commercial fisheries, groundfish, Pacific cod, *Gadus macrocephalus*, state waters, parallel, Annual Management Report.

## INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) Division of Commercial Fisheries manages all commercial groundfish fisheries within the territorial waters of the Prince William Sound (PWS) and Cook Inlet (CI) management areas, which are defined as those waters from the shoreline to 3 nautical miles (nmi) offshore (5 AAC 39.975). Under state regulation, groundfish are defined as all marine finfish except halibut, osmerids, herring, and salmonids, and includes Pacific cod, *Gadus macrocephalus*. For territorial waters, the Alaska Board of Fisheries (BOF) establishes management regulations and ADF&G uses its emergency order (EO) authority to make adjustments to fishing time and area. The BOF schedules regular meetings for PWS and CI groundfish on a triennial basis. Except for lingcod, black rockfish, and dark rockfish, the National Marine Fisheries Service (NMFS) manages groundfish resources in waters of the exclusive economic zone (EEZ), located from 3–200 nmi offshore, under fishery management plans (FMP) developed by the North Pacific Fishery Management Council (NPFMC). Gulf of Alaska (GOA) waters under federal jurisdiction and located adjacent to the PWS and CI areas are divided into two management units and named the Central Gulf of Alaska (CGOA) and Eastern Gulf of Alaska (EGOA).

In addition to area-specific plans that guide state management of Pacific cod within Alaska territorial waters (5 AAC 28.267 *Prince William Sound Pacific Cod Management Plan* and 5 AAC 28.367 *Cook Inlet Pacific Cod Management Plan*), numerous “general” statewide groundfish regulations affect Pacific cod fishing. These include a vessel registration requirement, legal gear definitions, bycatch allowances, and requirements for seabird avoidance measures to be used when fishing with longline gear. Vessel registration for Pacific cod may be nonexclusive, which allows a vessel to register with ADF&G to fish more than one management area (but not concurrently) within a calendar year, or exclusive, which restricts a vessel from fishing in another exclusive area, but would allow a vessel to fish in a nonexclusive area. Legal

gear for Pacific cod is restricted to trawl, longline, pot, or jig depending upon the fishery and area although use of nonpelagic trawl is prohibited. Groundfish pots must have a biodegradable escape mechanism as described in 5 AAC 39.145 and pot tunnels may not exceed 36 inches in perimeter. Bycatch retention is restricted to a maximum of 20%, by weight, of the directed groundfish and halibut aboard a vessel. Finally, vessels greater than 26 feet in overall length and fishing longline gear in state waters must employ seabird avoidance measures to reduce seabird mortality related to feeding attempts on baited longlines. Two areas, the PWS Inside District and the Cook Inlet District, have been exempted from this requirement.

Historically, commercial Pacific cod seasons in both PWS and CI were managed via EO to coincide with seasons and allowable gear set by NMFS in the adjacent federal CGOA. These fisheries were adopted into regulation as part of the CI and PWS Pacific cod management plans in November 1996, defined as “parallel seasons” and first implemented in 1997. Similar to historical seasons, parallel seasons are set by EO to coincide with the federal CGOA fishery for Pacific cod with respect to season dates and allowable gear types, provided those gear types are legal in state waters. Parallel season Pacific cod fishery harvests, as well as any bycatch to other directed fisheries in state waters, are accounted against the total allowable catch (TAC) set by NMFS for CGOA waters. Vessel registration for parallel seasons is nonexclusive.

The PWS and CI Pacific cod management plans also established a second type of Pacific cod season, a “state-waters season” which opens following the initial parallel season. This type of fishery is managed for a guideline harvest level (GHL) that is calculated annually as a fixed percentage of the total allowable harvest set by NMFS for adjacent federal waters. For example, the PWS GHL is calculated as 25% of the EGOA and CI as 3.75% of the CGOA total allowable harvest. State-waters Pacific cod seasons were adopted to provide a Pacific cod harvest opportunity for local communities, by local fleets with low halibut bycatch. Vessel registration for state-waters seasons is exclusive.

Finally, the Pacific cod management plans allow ADF&G to open and close fishing seasons by EO at times other than those specified in the plan if the GHL has been reached and a federal season is ongoing in adjacent federal waters, or if ADF&G determines it is necessary to adapt to unanticipated openings or closures of the federal season, maintain sustained yield management, or provide for orderly fisheries. The flexibility afforded by this plan element has allowed ADF&G to open a second parallel season on September 1, concurrent with the NMFS CGOA Pacific cod opening.

In 2001, the BOF recognized NMFS fishing gear closures for Pacific cod in critical habitat around haulouts and rookeries of endangered Steller sea lions (SSL) *Eumetopias jubatus* by giving the commissioner EO authority to adopt federal closures surrounding these areas. Beginning in 2002, the BOF also adopted the federal vessel monitoring system (VMS) requirement for all parallel fisheries. This action was adopted to provide more precise harvest location information in support of fishery enforcement efforts to protect SSL and some protected habitats.

Commercial Pacific cod harvests are primarily monitored inseason through ADF&G fish tickets (5 AAC 39.130) with additional information derived from dockside sampling of the commercial catch and dockside interviews. Dockside sampling involves collection of biological data such as species, size, sex, gonad condition, and age structures, as well as information on harvest location and effort. In PWS and CI, reporting requirements specify that all groundfish retained, but not

delivered for sale, such as catch that is retained for personal use or used as bait at sea, must be reported on an ADF&G fish ticket. One of the most reliable means of improving fisheries management is through complete and accurate documentation of fisheries mortality, particularly reporting of all harvest removals.

This report describes annual harvests and exvessel values for the commercial Pacific cod fisheries managed by ADF&G in the PWS and CI management areas through 2010, with an outlook for the 2011 season including preliminary data through July 31, 2011.

## **PRINCE WILLIAM SOUND AREA**

### **HISTORICAL BACKGROUND**

Prince William Sound Management Area boundaries have been adjusted several times since 1996. The PWS Area currently encompasses waters of Alaska from 144° 00' W. longitude, near Cape Suckling, to the longitude of Cape Fairfield at 148° 50.25' W. longitude (Figure 1). The area is divided into the Inside and Outside Districts. The Inside District is waters enclosed by lines from Point Whithshed to Point Bentinck, from Cape Hinchinbrook to Zaikof Point, and from Cape Cleare to Cape Puget. The Outside District, comprised of the Gulf of Alaska waters 0–3 miles from shore, is divided into the Eastern and Western sections. The Eastern Section includes waters between 144° 00' W. longitude and 147° 00' W. longitude and the Western Section includes waters between 147° 00' W. longitude and Cape Fairfield.

ADF&G has complemented NMFS closures to protect SSL at two locations in the Outside District annually by EO. All groundfish fishing was closed within 3 nmi of Seal Rocks in Hinchinbrook Entrance and Wooded Island along outer Montague Island (Figure 2).

Area regulations specify a groundfish pot closure area, to protect recovering Tanner crab stocks, in waters of eastern PWS, except Orca Bay and in waters greater than 75 fathoms deep in Hinchinbrook Entrance (Figure 3).

Groundfish pots may be stored in a designated area 10 days prior to and 10 days following a state-waters season. All groundfish pots must be removed from the water following the closure of the parallel season.

Although area regulations restricted nonpelagic trawl gear in 1997, shrimp trawl vessels may retain groundfish bycatch not to exceed 10% of the gross weight of the landed shrimp. In addition, there is a single bottom trawl permit in the limited entry sablefish *Anoplopoma fimbria* fishery. Area regulations also allow groundfish bycatch taken in the salmon gillnet fishery to be retained at specified levels.

Despite the statewide regulation setting a maximum aggregate 20% bycatch allowance, a PWS regulation was adopted in 2008 allowing a separate 20% bycatch allowance of Pacific cod, in addition to the aggregate allowance.

### **PRINCE WILLIAM SOUND PARALLEL PACIFIC COD FISHERY**

Early PWS Pacific cod seasons spanned January 1 to approximately mid-March and more recently, have shortened to approximately 1 month in duration (Berceli et al. 2008b; Table 1). During 1997–1999, NMFS reopened Pacific cod for a second directed fishing period in

September or October. These were typically short openings ranging from 4 days to 5 weeks in duration. In 2007, a fall season was reopened and remained open through December 31, although in 2008 and 2009, the season was approximately 1 month in duration.

Since 1988, annual catch and effort in the parallel Pacific cod fishery ranged from 11,204 lb from 38 landings by 24 vessels in 2005 to 2.2 million lb from 234 landings by 88 vessels in 1991 (Berceli et al. 2008a; Table 2; Figure 4). Peak harvests occurred during 1990–1995 and averaged 1.7 million lb annually. From 1996–2000, harvests declined to less than 1.0 million lb in all years, except 1999, when the harvest surpassed 1.3 million lb. In 2001 harvest declined to approximately 170,000 lb and during 2002–2006 averaged 15,185 lb. Recent harvests have increased somewhat since 2006 with nearly all taken by longline gear. Prior to 1990, nearly all Pacific cod was harvested by longline gear. Following expansion of the pot fishery for Pacific cod in 1991, the proportion harvested by pot gear increased to a high of 83% in 1994. However, since 2001, longline has again accounted for the majority of the parallel season harvest, ranging from 81–100%. The decline in parallel season catch and effort can be attributed to a variety of biological and economic factors, such as shortened season, loss of a directed yelloweye rockfish harvest opportunity due to restructuring of the PWS rockfish fishery to a bycatch-only fishery, high exvessel prices for halibut and sablefish relative to Pacific cod, and increased fixed costs.

Value of the PWS Pacific cod parallel fishery during the period 1988–2009 ranged from \$3,923 in 2002 to \$556,857 in 1991 and averaged of \$166,681 (Table 3).

## **PRINCE WILLIAM SOUND STATE-WATERS PACIFIC COD FISHERY**

When the state-waters season began in 1997, the fishery was prosecuted only in the PWS Inside District and was open to pot or jig gear. Acting on a department proposal in 2003, the BOF reduced the PWS state-waters Pacific cod GHL from 25% to 10% of the EGOA total allowable harvest of Pacific cod and provided for the allocation to increase to 15%, and then 25%, following years when the allocation is harvested. Reducing the regulatory allowance for Pacific cod aligned industry expectations with past fishery performance. Providing for an incremental percentage increase was also consistent with the initial structure of other state-waters Pacific cod fisheries. However, despite the adjustments in the fishery, the GHL was not achieved.

In 2000, regulations were modified to allow fishing in the Western Section of the Outside District of PWS. In 2009, new regulations expanded fishing into Eastern Section waters located west of Hook Point (146° 15.12 W. long) and added longline as a legal gear in the PWS state-waters Pacific cod fishery.

Current elements of the PWS state-waters Pacific cod fishery include:

- Season opens by EO 7 days following closure of the federal CGOA season;
- PWS is an exclusive registration area for Pacific cod;
- GHL calculated as 25% of the total allowable harvest of Pacific cod for the federal EGOA;
- Legal gear is 60 pots (buoy tag requirement), 5 jigging machines, or longline;
- Pot closure when 60% of the GHL is reached, or December 31;
- No allocation for jig or longline but longline closes May 1;

- Pacific cod may be taken in the waters of the PWS Area, except those waters east of 146° 15.12' W. long (Figure 3);
- Any GHL remaining on October 1 becomes available to both pot and jig gear;
- After October 30, ADF&G may relax gear limits and registration requirements to promote full utilization of the state-waters GHL (5 AAC 28.267 (g)); and
- Rockfish bycatch is limited to 5%.

Harvest and GHL varied inversely in the PWS state-waters Pacific cod fishery until recently. Total harvest for the PWS state-waters fishery ranged from 0 to 418,994 lb from the beginning of the fishery through 2008 (Table 4; Figure 4). During the same period, effort ranged from 0 to 12 vessels. The highest GHLs in 2000–2003 began a period of steady decline in harvest that continued with minimal catches during 2001–2006. However, most of the data are confidential due to low participation. The disparity between harvest and GHL was the result of a decline in Pacific cod fishing effort and an increase in Pacific cod allowable harvest in the EGOA. Although the pot limit and exclusive area registration requirement were relaxed on October 31 each year, as stipulated in the management plan, these changes had no apparent effect on the fishery. Pot gear harvested up to 75% of the pot allocation in the early years, peaked at 385,817 lb in 1998, and declined to zero in 2001. Jig harvest peaked in 1999 at 79,147 lb. In 2007, total harvest increased to 345,684 lb, or 38% of the GHL, before again declining to 1% in 2008 (Table 5). With the addition of longline gear in 2009, the GHL was achieved in 13 days, exclusively by this gear type, and marked the first time the GHL was achieved since the fishery began.

Value for the PWS state-waters Pacific cod fishery has ranged from \$0 to almost \$250,000 during the years 1997–2009 with value exceeding \$200,000 only in 2009 (Table 3).

## **2010 SEASON SUMMARY**

The 2010 PWS parallel Pacific cod season was open January 1 through noon January 31 and noon September 1 through noon September 13 for a total directed parallel season length of 43 days (Table 1). Total harvest for the 2010 parallel season, which also includes bycatch to other directed fisheries, was 89,026 lb from 93 landings by 40 vessels, and the majority was caught by vessels fishing longline gear (Table 2; Figure 4). The 2010 PWS parallel fishery value was \$24,927, nearly equal to the recent 10-year average of the fishery (Table 3).

The 2010 state waters season opened at noon February 7 with a GHL of 784,735 lb (Table 4). In 2010, the GHL was increased from 10% to 15% of the EGOA total allowable harvest due to attainment of the 2009 GHL. The state-waters Pacific cod season closed to all gear types at noon February 23, for a fishery duration of 16 days and a total 2010 harvest of 825,226 lb from 45 landings by 24 vessels predominantly fishing longline gear (Table 5). This marked the second year in a row the GHL was achieved and only the second time since the fishery began in 1997. This success is attributable to longline becoming an allowable gear type for the state-waters fishery beginning in 2009. Fishery value in 2010 was \$231,063 (Table 3). A reduction in price per pound made this the second highest year in value despite being the largest harvest in all years.

## **2011 SEASON OUTLOOK**

The 2011 Pacific cod season is in progress; however, the initial parallel and state-waters seasons have already closed (Table 1). The initial parallel season was open January 1 through noon January 29. Total preliminary harvest through July 31 for the 2011 parallel season, which also includes bycatch to other directed fisheries, is 97,875 lb from 42 landings by 22 vessels predominantly fishing longline gear (Table 2; Figure 4). The second parallel season will open September 1 and is expected to close in late September or early October.

The state-waters season opened at noon February 5, with a GHLL of 1,435,195 lb, which represented the final incremental increase to 25% of the EGOA total allowable harvest (Table 4). The state-waters season closed to all gear at noon February 23, with achievement of the GHLL in 18 days solely by longline gear. Harvest and effort totaled 1,594,590 lb from 68 landings by 25 vessels (Table 4; Figure 4). This marked the third consecutive year that the GHLL was achieved and the only time since the fishery began in 1997.

## **HARVEST MONITORING**

Dockside sampling of Pacific cod and fishermen interviews were conducted during the PWS state-waters season. Information collected by dockside samplers included fishing location and effort, as well as fish length, weight, sex, maturity stage, and age structures.

In 2010, 750 Pacific cod were sampled in the PWS fisheries, with most coming from the Cape Puget area. Pacific cod from PWS averaged 66 cm in fork length, which was larger than fish sampled from the CI Area (Figure 5). Length frequency data from the most recent 4 years, 2007–2010 are depicted in Figure 6 (2006 data are not shown due to the small sample size of 8 fish).

Otoliths were collected from approximately 50% of samples. Pacific cod age determination can be problematic and age accuracy has been unresolved in past years (Carlile 2005). Because Pacific cod in the GOA are managed by NMFS using a length, rather than age-structured model, a decision was made to reduce otolith sampling and archive otoliths for future age determination. However, recent indications of greater site fidelity in Pacific cod than was previously assumed suggest that further analysis and more focused assessment of state-waters Pacific cod may be warranted.

Ancillary information on Pacific cod age, sex, size, and distribution is also collected during the trawl surveys in Prince William Sound; survey results are reported under separate titles (Bechtol 2001).

## **COOK INLET AREA**

### **HISTORICAL BACKGROUND**

The CI Management Area, or Registration Area H, consists of all waters of Alaska enclosed by a line extending east from Cape Douglas (58° 51.10' N. lat.) and a line extending south from Cape Fairfield (148° 50.25' W. long.) (Figure 7). The CI Area is divided further into the CI and North Gulf districts. The CI District includes all waters of Alaska in the CI Area north of a line from Cape Douglas to Point Adam (59° 15.27' N. lat.). The North Gulf District includes all waters of Alaska in the CI Area north of Cape Douglas and west of the longitude of Cape Fairfield, excluding the CI District.

Similar to PWS, ADF&G has adopted fishing closures to complement NMFS actions to protect SSLs. Fishing with longline or pot gear within 10 nmi of Sugarloaf Island (within the Barren Islands group) and Outer Pye Island has been closed annually since 2001 via EO (Figure 8).

Legal gear types for groundfish fishing in the CI Area are longline, pelagic trawl, hand troll, mechanical jig, and pots. In most area fisheries, if more than one gear type is legal, only one gear type may be aboard at a time.

Area regulations specify localized closures to groundfish pots in portions of Kachemak and Kamishak bays to protect depressed king crab stocks and rebuild Tanner crab stocks (Bechtol et al. 2002) (Figures 9 and 10). Limited onboard observer data from vessels using pot gear in Kachemak Bay suggest this closure area achieves the goal of protecting crab in critical habitat.

Pot gear may be stored in the water following a closure of a parallel season with all bait and bait containers removed and all doors secured fully open if pots are rectangular, or doors not secured closed if pots are conical or pyramid. All groundfish pots must be removed from the water no later than 5 days after the closure of a season.

### **COOK INLET PARALLEL PACIFIC COD FISHERY**

Early seasons spanned January 1 to approximately mid-March and more recently, have ranged from 1 to 2 months duration (Table 6). During 1997–1999, NMFS reopened Pacific cod for a second directed fishing period in September or October (Trowbridge et al. 2008). These were typically short openings ranging from 4 days to 5 weeks in duration. Beginning in 2006, ADF&G opened a second parallel season on September 1 to coincide with the federal season. In both 2006 and 2007, these seasons remained open through December 31. In more recent years, seasons have lasted approximately one month.

Since 1988, annual catch and effort in the CI parallel Pacific cod fishery ranged from 36,846 lb from 21 landings by 9 vessels in 1989 to 5,441,421 lb from 868 landings by 190 vessels in 1992 (Table 7; Figure 11). Peak harvests occurred during 1991–2000, averaging 3.3 million lb with longline gear accounting for an average of 60% of the harvest and pot gear averaging 34%. After 2000, parallel season harvests declined to less than 1.0 million lb annually, primarily due to a shift to the Kodiak Area by the local longline fleet. Although pot gear took the larger percentage of the harvest during 2003–2006, longline has taken the majority during 2007–2009.

Fishery value for the CI Pacific cod parallel fishery has ranged from \$2,579 to \$1,254,527 during 1988–2009, with an average value of \$487,830 for those years (Table 8). The fishery value has only exceeded \$1 million in 4 of those years.

### **COOK INLET STATE-WATERS PACIFIC COD FISHERY**

Since adoption in 1997, the state-waters Pacific cod season has been modified numerous times. The plan originally specified a state-waters season that began 7 days following closure of the parallel season, and closing each time the federal CGOA directed Pacific cod season reopened (under parallel season rules), and a pot closure period of April 7 to June 15. This latter element addressed an industry concern for reduced quality of post-spawn product. Each of these original plan elements has been amended. In 2000, the 7-day closure between the parallel and state-waters seasons, meant to ensure separation of the fisheries and facilitate accurate seasonal catch accounting, was reduced to 24 hours and the plan was further modified to enable the state-waters season to remain open despite subsequent federal CGOA openings, which would have normally

resulted in a parallel season. Although the product quality concerns meant to be addressed by the pot closure period were not realized, the closure period was retained, but reduced to May 1 to June 15 by BOF action in 1999. The closure was retained due to user interest in ensuring a fall season Pacific cod fishing opportunity while providing an additional 3 weeks of pot fishing time.

Due to attainment of the 2003 GHL and consistent with the management plan, beginning in 2004, the state-waters Pacific cod allocation increased from 2.25% to 3% of the federal CGOA total allowable harvest. During its 2004 meeting cycle, the BOF adopted several changes to state-waters Pacific cod regulations that became effective during 2005. These changes included increasing the percent calculation for the GHL from 3.00% to 3.75%, setting a harvest cap of 25% of the GHL for vessels greater than 58 ft in length, and new gear allocations that changed from 50% each to 75% for pot and 25% for jig gear.

Current elements of the Cook Inlet state-waters season include:

- Season opens by EO 24 hours following closure of the initial federal season in the CGOA area by NMFS;
- Exclusive area registration: stipulates a vessel may not validly register for more than one exclusive Pacific cod registration area during a state-managed season;
- GHL calculated as 3.75% of the CGOA estimated total allowable harvest;
- Legal gear is 60 pots (buoy tag requirement) or 5 jigging machines;
- Allocated 75% to pot gear prior to October 1 and 25% to jig gear;
- A 25% cap on vessels longer than 58 ft and fishing pot gear;
- Pot gear closure from May 1 to June 15;
- If the jig allocation is not achieved before September 1, the balance of the allocation becomes available to pot gear; and
- Gear limits and the exclusive area registration requirement may be relaxed after October 30 if ADF&G judges the action necessary to achieve the GHL.

State-waters season Pacific cod harvests have ranged from 730,469 lb from 306 landings by 42 vessels in 1998 to just over 2.5 million lb from 222 landings by 18 vessels in 2009 (Table 9; Figure 11). Pot gear has remained the dominant gear in the fishery. Although jig gear harvested 67% of the 1997 season harvest total, this occurred during the “implementation year” in which regulations became effective on April 3, only 4 days prior to the spring pot closure. Jig harvest fell to 26% of the 1998 harvest and averaged less than 2% of the harvest during 2000–2002 and has never achieved its allocation. The CI state-waters Pacific cod GHL has only been achieved in 2003 (Table 10). However, the pot allocation has been achieved in all years since 2003, except 2006 and 2007 when catch rates were low despite relatively high estimates of Pacific cod abundance.

While fishing with both jig and pot gears can be productive from late winter through late spring, the most effective period for jig gear has been the March to May period. Although ADF&G has only limited data on spring Pacific cod distributions in the CI Area (Bechtol 2001), studies from other areas suggest that cod aggregate in major spawning areas during January through March,

then migrate to shallower, nearshore waters as part of a spring post spawning migration (Shimada and Kimura 1994).

Value for the CI Pacific cod state waters fishery has ranged from \$175,313 to just over \$1.4 million during the period 1997–2009, with an average value of \$598,655 for those years (Table 8). The highest values have occurred during the most recent 2 years.

## **2010 SEASON SUMMARY**

The 2010 CI parallel Pacific cod season was open January 1 through noon January 31 and noon September 1 through noon September 13 (Table 6). Total harvest for the 2010 parallel season, which also includes bycatch to other directed fisheries, was 426,223 lb from 124 landings by 50 vessels, with the catch split 46% to 54% between vessels fishing longline and pot gear (Table 7; Figure 11). The 2010 CI Pacific cod parallel fishery value was \$123,610, well below the average value for all years (Table 8).

The 2010 Cook Inlet state-waters season opened at noon January 30 with a GHF of 4,054,466 lb (Table 9). Harvest totaled 3,123,626 lb with pot gear landing 3,074,871 lb or 98% of the total. The state-waters season closed to all pot vessels at 4:00 PM March 28 due to achieving the pot allocation, although the season remained open to jig gear. Following the fall parallel season closure, the season reopened to pot and jig gear at noon September 13, when the remaining jig allocation became available to both gear types (Table 6). The season closed December 31 and unlike most previous years, there was no Pacific cod harvest by pot gear during the fall and early winter months. Total value of the 2010 harvest was estimated at \$905,852, the second highest since the fishery began (Table 8).

## **2011 SEASON OUTLOOK**

The 2011 CI Pacific cod season is in progress. The initial parallel season was open January 1 through noon January 29 (Table 6). Total preliminary harvest through July 31 for the 2011 parallel season, which also includes bycatch to other directed fisheries, is 590,938 lb from 77 landings by 32 vessels (Table 7; Figure 11), which is comparable to the recent 10-year average harvest of 517,339 lb. The second parallel season will open September 1 and is expected to close in late September or early October.

The 2011 CI Area state-waters season opened January 30 with a GHF of 4.45 million lb. This is the largest GHF in the fishery's history and is attributable to the high abundance of Pacific cod indicated by the NMFS stock assessment. Total harvest through July 31 is 3,987,659 lb and harvest by pot and jig gears is approximately 3.5 million lb and 492,020 lb respectively (Table 9; Figure 11). Both total harvest and harvest by pot gear are the highest since the fishery began. Jig harvest may surpass the previous season-high harvest of 561,947 lb set in 1997. Increased interest in this gear and fishery is attributable to recent success of jig gear, participation by vessels previously engaged in sport charter, and the overall economy. So far 29 jig vessels have participated in the 2011 fishery, the highest number since 1998 (Table 9). The season closed for pot vessels greater than 58 ft in overall length on March 13 and to pot vessels 58 ft or less at noon March 19. The jig season is ongoing. Currently, pot gear has harvested 79% of the GHF and jig gear 11% (Table 10). The remaining jig allocation will become available to both pot and jig gear September 1, although this action will take effect following closure of the second parallel season and reopening of the state-waters season.

## **HARVEST MONITORING**

Dockside sampling of Pacific cod and fishermen interviews were conducted during the CI parallel and state-waters seasons. Information collected by dockside samplers included fishing location and effort as well as fish length, weight, sex, maturity stage and age structures.

In 2010, 1,800 Pacific cod were sampled in the CI Area, composed of 1,100 from the CI District and 700 from the North Gulf District. Fish sampled from the North Gulf District have averaged consistently larger than those in the CI District historically, and that trend continued in 2010. Cook Inlet District fish averaged 62 cm in fork length, while fish from the North Gulf District averaged 65 cm (Figure 5). Length frequency data from the most recent 5 years, 2006–2010, are depicted in Figures 12 and 13 for the CI and North Gulf districts, respectively. Otoliths were collected from 20% of fish sampled and similar to PWS, are being archived at this time.

Ancillary information on Pacific cod age, sex, size, and distribution is also collected during the trawl surveys in Kachemak and Kamishak bays; survey results are reported under separate titles (Bechtol 2001).

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## **TABLES AND FIGURES**

Table 1.–Prince William Sound Pacific cod parallel and state waters season dates, 1997–2010, with available data for 2011.

| Year               | Dates and Times <sup>a</sup>  | Season and Gear                     |
|--------------------|---|-------------------------------------|
| 1997 <sup>b</sup>  | 1/1/97 - 3/11/97; 10/2/97 - 10/26/97                                  | Parallel season, all gear           |
|                    | 4/4/97 <sup>a</sup> - 10/2/97; 10/26/97 - 12/31/97                    | State season jig and pot            |
| 1998 <sup>b</sup>  | 1/1/98 - 3/10/98; 10/5/98 - 10/9/98                                   | Parallel season, all gear           |
|                    | 3/17/98 - 10/5/98; 10/9/98 - 12/31/98                                 | State season jig and pot            |
| 1999 <sup>b</sup>  | 1/1/99 - 3/14/99; 9/1/99 - 10/5/99                                    | Parallel season, all gear           |
|                    | 3/21/99 - 9/1/99; 10/5/99 - 12/31/99                                  | State season jig and pot            |
| 2000 <sup>bc</sup> | 1/1/00 - 3/4/00   | Parallel season, all gear           |
|                    | 3/11/00 - 12/31/00 (PWS Inside District)                              | State season jig and pot            |
|                    | 7/5/00 - 12/31/00, PWS Outside District, Western Section <sup>c</sup> | State season jig and pot            |
| 2001 <sup>b</sup>  | 1/1/01 - 2/26/01  | Parallel season, longline only      |
|                    | 1/1/01 - 3/4/01   | Parallel season, all remaining gear |
|                    | 3/11/01 - 12/31/01  | State season jig and pot            |
| 2002 <sup>b</sup>  | 1/1/02 - 3/9/02   | Parallel season, all gear           |
|                    | 3/16/02 - 12/31/02  | State season jig and pot            |
| 2003 <sup>b</sup>  | 1/1/03 - 2/9/03; bycatch until 9/9 then closed to retention           | Parallel season, all gear           |
|                    | 2/16/03 - 12/31/03  | State season jig and pot            |
| 2004 <sup>b</sup>  | 1/1/04 - 1/31/04  | Parallel season, all gear           |
|                    | 2/07/04 - 12/31/04  | State season jig and pot            |
| 2005 <sup>b</sup>  | 1/1/05 - 1/26/05  | Parallel season, all gear           |
|                    | 2/02/05 - 12/31/05  | State season jig and pot            |
| 2006 <sup>b</sup>  | 1/1/06 - 2/28/06  | Parallel season, all gear           |
|                    | 3/7/06 - 12/31/06   | State season jig and pot            |
| 2007               | 1/1/07 - 2/27/07; 9/1/07 - 12/31/07                                   | Parallel season, all gear           |
|                    | 3/6/07 - 9/1/07   | State season jig and pot            |
| 2008 <sup>b</sup>  | 1/1/09 - 2/20/08; 9/1/08 - 10/3/08                                    | Parallel season, all gear           |
|                    | 2/27/08 - 9/1/08; 10/4/08 - 12/31/08                                  | State season jig and pot            |
| 2009 <sup>d</sup>  | 1/1/09 - 1/27/09; 9/1/09 - 10/1/09                                    | Parallel season, all gear           |
|                    | 2/3/09 - 3/27/09  | State season jig and pot            |
|                    | 12:01 AM 3/14/09 - 3/27/09 <sup>d</sup>                               | State season longline <sup>d</sup>  |
| 2010               | 1/1/10 - 1/31/10; 9/1/10 - 9/13/10                                    | Parallel season, all gear           |
|                    | 2/7/10 - 2/23/10  | State season jig, pot, and longline |
| 2011               | 1/1/11 - 1/29/11; <i>expected to reopen September 1<sup>e</sup></i>   | Parallel season, all gear           |
|                    | 2/5/11 - 2/23/11  | State season jig, pot, and longline |

a Opening and closure times occurred at noon unless otherwise noted; except that openings on January 1 occurred at 12:01 am and closures on December 31 occurred at midnight.

<sup>b</sup> Gear and area registration requirements relaxed on October 31.

<sup>c</sup> New regulations became effective allowing fishing in PWS Western Section of Outside District.

<sup>d</sup> New regulations became effective allowing longline as a legal gear for state waters season; fishing allowed in Eastern District to west of Hook Point.

<sup>e</sup> 2011 Season ongoing; state waters season closed; parallel season expected to open September 1.

Table 2.—Annual effort and harvest by gear type of Pacific cod from the Prince William Sound parallel fisheries, 1988–2010, and preliminary 2011 data through July 31.

| Year              | Vessels | Landings | Harvest (lb) <sup>a</sup> |           |           |                  | Total                  |
|-------------------|---------|----------|---------------------------|-----------|-----------|------------------|------------------------|
|                   |         |          | Other <sup>b</sup>        | Longline  | Pot       | Jig <sup>c</sup> |                        |
| 1988              | 39      | 87       |                           | 330,718   |           |                  | 330,718                |
| 1989              | 23      | 45       | d                         | 71,845    |           | d                | 73,600                 |
| 1990              | 84      | 307      | d                         | 1,203,118 | d         | d                | 1,219,979              |
| 1991              | 88      | 234      | 17,074                    | 1,248,217 | 961,912   | d                | 2,227,204 <sup>e</sup> |
| 1992              | 140     | 524      | d                         | 1,359,176 | 594,741   | d                | 1,972,969              |
| 1993              | 57      | 205      | d                         | 810,831   | 466,202   | d                | 1,304,977              |
| 1994              | 46      | 197      |                           | 316,550   | 1,584,722 | d                | 1,901,272 <sup>e</sup> |
| 1995              | 75      | 205      | 24,539                    | 359,765   | 1,204,451 | 6,982            | 1,595,736              |
| 1996              | 50      | 135      | 218,170                   | 214,021   | 420,183   | 1,663            | 854,037                |
| 1997              | 60      | 172      | 1,506                     | 334,086   | 582,325   | 4,333            | 922,249                |
| 1998              | 50      | 150      | 5,879                     | 534,553   | 138,243   |                  | 678,675                |
| 1999              | 54      | 196      | 1,909                     | 687,169   | 641,523   | d                | 1,330,601 <sup>e</sup> |
| 2000              | 58      | 175      | d                         | 403,230   | 332,310   |                  | 735,540 <sup>e</sup>   |
| 2001              | 23      | 63       | d                         | 143,641   | d         |                  | 170,445                |
| 2002              | 22      | 51       | d                         | 17,700    |           |                  | 17,700 <sup>e</sup>    |
| 2003              | 26      | 45       | 234                       | 14,051    |           | d                | 14,285 <sup>e</sup>    |
| 2004              | 17      | 45       | d                         | 13,247    |           |                  | 13,247 <sup>e</sup>    |
| 2005              | 24      | 38       | 221                       | 10,983    |           |                  | 11,204                 |
| 2006              | 30      | 59       | 587                       | 18,407    |           |                  | 18,994                 |
| 2007              | 31      | 82       | d                         | 64,807    | d         | d                | 80,417                 |
| 2008              | 35      | 78       |                           | 66,563    |           |                  | 66,563                 |
| 2009              | 41      | 90       | d                         | 166,190   |           |                  | 166,190 <sup>e</sup>   |
| 2010              | 40      | 93       | 326                       | 88,700    |           |                  | 89,026                 |
| 2011 <sup>f</sup> | 22      | 42       | 345                       | 97,530    | d         |                  | 97,875 <sup>e</sup>    |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> “Other” includes trawl and gillnet gear.

<sup>c</sup> Includes mechanical jig and hand troll.

<sup>d</sup> Confidential data due to limited number of participants.

<sup>e</sup> Total harvest does not include confidential data.

<sup>f</sup> Preliminary data through July 31, 2011.

Table 3.—Annual harvest and value for the Prince William Sound Area Pacific cod parallel and state-waters seasons, 1988–2010.

| Year              | Price per lb | Parallel Season Harvest (lb) <sup>ab</sup> | Parallel Season Value | State-waters Season Harvest (lb) <sup>a</sup> | State-waters Season Value | Total Combined Pacific cod Fishery Value |
|-------------------|--------------|--|-----------------------|---|---------------------------|--|
| 1988              | \$0.21       | 330,718                                    | \$69,451              |   |                           | \$69,451                                 |
| 1989              | \$0.19       | 73,600                                     | \$13,984              |   |                           | \$13,984                                 |
| 1990              | \$0.20       | 1,219,979                                  | \$243,996             |   |                           | \$243,996                                |
| 1991              | \$0.25       | 2,227,428                                  | \$556,857             |   |                           | \$556,857                                |
| 1992              | \$0.13       | 1,972,969                                  | \$256,486             |   |                           | \$256,486                                |
| 1993              | \$0.18       | 1,304,977                                  | \$234,896             |   |                           | \$234,896                                |
| 1994              | \$0.19       | 1,902,336                                  | \$361,444             |   |                           | \$361,444                                |
| 1995              | \$0.24       | 1,595,736                                  | \$382,977             |   |                           | \$382,977                                |
| 1996              | \$0.22       | 854,037                                    | \$187,888             |   |                           | \$187,888                                |
| 1997 <sup>c</sup> | \$0.26       | 922,249                                    | \$239,785             | 200,520                                       | \$52,135                  | \$291,920                                |
| 1998              | \$0.24       | 678,675                                    | \$162,882             | 418,994                                       | \$100,559                 | \$263,441                                |
| 1999              | \$0.34       | 1,330,710                                  | \$452,441             | 394,134                                       | \$134,006                 | \$586,447                                |
| 2000              | \$0.38       | 735,963                                    | \$279,666             | 291,142                                       | \$110,634                 | \$390,300                                |
| 2001              | \$0.35       | 170,445                                    | \$59,656              | 228   | \$80                      | \$59,736                                 |
| 2002              | \$0.22       | 17,831                                     | \$3,923               | 0   | \$0                       | \$3,923                                  |
| 2003              | \$0.33       | 14,292                                     | \$4,716               | d   | d                         | d  |
| 2004              | \$0.46       | 13,604                                     | \$6,258               | d   | d                         | d  |
| 2005              | \$0.44       | 11,204                                     | \$4,930               | d   | d                         | d  |
| 2006              | \$0.42       | 18,994                                     | \$7,977               | d   | d                         | d  |
| 2007              | \$0.48       | 80,417                                     | \$38,600              | 345,684                                       | \$165,928                 | \$204,528                                |
| 2008              | \$0.60       | 66,563                                     | \$39,938              | 7,557   | \$4,534                   | \$44,472                                 |
| 2009              | \$0.35       | 166,401                                    | \$58,240              | 704,866                                       | \$246,703                 | \$304,943                                |
| 2010              | \$0.28       | 89,026                                     | \$24,927              | 825,226                                       | \$231,063                 | \$255,991                                |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes Pacific cod bycatch to other directed groundfish and halibut fisheries in state waters.

<sup>c</sup> State-waters season implemented in 1997.

<sup>d</sup> Confidential data due to limited number of participants.

Table 4.—Annual effort, guideline harvest level (GHL), and harvest by gear type of Pacific cod from the Prince William Sound state-waters season, 1997–2010, and preliminary 2011 data.

| Year              | Vessels      | Landings | GHL       | Harvest (lb) <sup>a</sup> |              |                  | Total        |
|-------------------|--------------|----------|-----------|---------------------------|--------------|------------------|--------------|
|                   |              |          |           | Longline                  | Pot          | Jig <sup>b</sup> |              |
| 1997              | 9            | 36       | 880,000   |                           | 192,142      | 8,378            | 200,520      |
| 1998              | 9            | 33       | 860,000   |                           | 385,817      | 33,177           | 418,994      |
| 1999              | 7            | 27       | 930,000   |                           | 314,987      | 79,147           | 394,134      |
| 2000              | 12           | 36       | 2,950,000 |                           | 268,765      | 22,377           | 291,142      |
| 2001              | 3            | 3        | 2,620,000 |                           | 0            | 228              | 228          |
| 2002              | 0            | 0        | 1,900,000 |                           | 0            | 0                | 0            |
| 2003              | <sup>c</sup> | 4        | 750,000   |                           | <sup>c</sup> | 0                | <sup>c</sup> |
| 2004              | <sup>c</sup> | 6        | 970,000   |                           | <sup>c</sup> | 0                | <sup>c</sup> |
| 2005              | <sup>c</sup> | 3        | 897,000   |                           | <sup>c</sup> | 0                | <sup>c</sup> |
| 2006              | <sup>c</sup> | 7        | 911,000   |                           | <sup>c</sup> | <sup>c</sup>     | <sup>c</sup> |
| 2007              | 3            | 20       | 911,000   |                           | <sup>c</sup> | <sup>c</sup>     | 345,684      |
| 2008              | 4            | 6        | 586,000   |                           | <sup>c</sup> | <sup>c</sup>     | 7,557        |
| 2009 <sup>d</sup> | 19           | 37       | 487,746   | 704,866                   | 0            | 0                | 704,866      |
| 2010              | 24           | 45       | 784,735   | 822,747                   | <sup>c</sup> | <sup>c</sup>     | 825,226      |
| 2011 <sup>e</sup> | 25           | 68       | 1,435,195 | 1,594,590                 | 0            | 0                | 1,594,590    |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes mechanical jig and hand troll.

<sup>c</sup> Confidential data due to limited number of participants.

<sup>d</sup> Longline became an allowable gear type for the PWS state-waters season.

<sup>e</sup> Preliminary data; state-waters season closed February 23, 2011.

Table 5.—Annual guideline harvest level (GHL), harvest by gear type, and percent of GHL harvested by gear type of Pacific cod from the Prince William Sound state-waters season, 1997–2010, and preliminary 2011 data.

| Year              | GHL       | Harvest (lb) <sup>a</sup> |                |           |                   |         |              |                  |              |
|-------------------|-----------|---------------------------|----------------|-----------|-------------------|---------|--------------|------------------|--------------|
|                   |           | Total                     | Total %<br>GHL | Longline  | Longline<br>% GHL | Pot     | Pot %<br>GHL | Jig <sup>b</sup> | Jig %<br>GHL |
| 1997              | 880,000   | 200,520                   | 23%            |           |                   | 192,142 | 22%          | 8,378            | 1%           |
| 1998              | 860,000   | 418,994                   | 49%            |           |                   | 385,817 | 45%          | 33,177           | 4%           |
| 1999              | 930,000   | 394,134                   | 42%            |           |                   | 314,987 | 34%          | 79,147           | 9%           |
| 2000              | 2,950,000 | 291,142                   | 10%            |           |                   | 268,765 | 9%           | 22,377           | 1%           |
| 2001              | 2,620,000 | 228                       | <1%            |           |                   | 0       | 0%           | 228              | <1%          |
| 2002              | 1,900,000 | 0                         | 0%             |           |                   | 0       | 0%           | 0                | 0%           |
| 2003              | 750,000   | c                         | c              |           |                   | c       | c            | 0                | 0%           |
| 2004              | 970,000   | c                         | c              |           |                   | c       | c            | 0                | 0%           |
| 2005              | 897,000   | c                         | c              |           |                   | c       | c            | 0                | 0%           |
| 2006              | 911,000   | c                         | c              |           |                   | c       | c            | c                | c            |
| 2007              | 911,000   | 345,684                   | 38%            |           |                   | c       | c            | c                | c            |
| 2008              | 586,000   | 7,557                     | 1%             |           |                   | 0       | 0%           | 7,557            | 1%           |
| 2009 <sup>d</sup> | 487,746   | 704,866                   | 145%           | 704,866   | 145%              | 0       | 0%           | 0                | 0%           |
| 2010              | 784,735   | 825,226                   | 105%           | 822,747   | 105%              | c       | c            | c                | c            |
| 2011 <sup>e</sup> | 1,435,195 | 1,594,590                 | 111%           | 1,594,590 | 111%              | 0       | 0%           | 0                | 0%           |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes mechanical jig and hand troll.

<sup>c</sup> Confidential data due to limited number of participants.

<sup>d</sup> Longline became an allowable gear type for the PWS state-waters season.

<sup>e</sup> Preliminary data; state-waters season closed February 23, 2011.

Table 6.–Cook Inlet Area Pacific cod parallel and state-waters season dates, 1997–2010, with available data for 2011.

| Year                | Dates and Times <sup>a</sup>  | Season and Gear                |
|---------------------|---|--------------------------------|
| 1997 <sup>b</sup>   | 1/1/97 - 3/11/97; 10/2/97 - 10/26/97  | Parallel season, all gear      |
|                     | 4/4/97 - 10/2/97; 10/26/97 - 12/31/97   | State season jig               |
|                     | 4/4/97 - 4/7/97; 6/15/97 - 10/2/97; 10/26/97 - 12/31/97                                 | State season pot               |
| 1998 <sup>b</sup>   | 1/1/98 - 3/1/98; 10/5/98 - 10/9/98  | Parallel season, all gear      |
|                     | 3/17 - 10/5/98; 10/9/98 - 12/31/98  | State season jig               |
|                     | 3/17/98 - 4/7/98; 6/15/98 - 10/5/98; 10/9/98 - 12/31/98                                 | State season pot               |
| 1999 <sup>b</sup>   | 1/1/99 - 3/14/99; 9/1/99 - 10/5/99  | Parallel season, all gear      |
|                     | 3/21/99 - 9/1/99; 10/5/99 - 12/31/99  | State season jig               |
|                     | 3/21/99 - 5/1/99; 6/15/99 - 9/1/99; 10/5/99 - 12/31/99                                  | State season pot               |
| 2000 <sup>b</sup>   | 1/1/00 - 3/4/00   | Parallel season, all gear      |
|                     | 3/5/00 - 12/31/00   | State season jig               |
|                     | 3/5/00 - 5/1/00; 6/15/00 - 12/31/00   | State season pot               |
| 2001 <sup>b</sup>   | 1/1/01 - 2/26/01  | Parallel season, longline gear |
|                     | 1/1/01 - 3/4/01   | Parallel season, pot/jig gears |
|                     | 3/5/01 - 12/31/01   | State season jig               |
| 2002 <sup>b</sup>   | 3/5/01 - 5/1/01; 6/15/01 - 12/31/01   | State season pot               |
|                     | 1/1/02 - 3/9/02   | Parallel season, all gear      |
|                     | 3/10/02 - 12/31/02  | State season jig               |
| 2003 <sup>b</sup>   | 3/10/02 - 5/1/02; 6/15/02 - 8/5/02; 9/1/02 - 12/31/02                                   | State season pot               |
|                     | 1/1/03 - 2/9/03; bycatch until 9/9 then closed to retention                             | Parallel season, all gear      |
|                     | 2/10/03 - 5:00 PM 12/8/03   | State season jig               |
| 2004 <sup>b</sup>   | 2/10/03 - 5:00 PM 2/27/03; 9/1/03 - 5:00 PM 12/8/03                                     | State season pot               |
|                     | 1/1/04 - 1/31/04  | Parallel season, all gear      |
|                     | 2/1/04 - 12/31/04   | State season jig               |
| 2005 <sup>bed</sup> | 2/1/04 - 5:00 PM 2/23/04; 9/1/04 - 12/31/04   | State season pot               |
|                     | 1/1/05 - 1/26/05  | Parallel season, all gear      |
|                     | 1/27/05 - 12/31/05  | State season jig               |
| 2006                | 1/27/05 - 3/16/05 <sup>d</sup> ; 3/16/05 <sup>d</sup> - 3 PM 3/26/05; 9/1/05 - 12/31/05 | State season pot vessels <58   |
|                     | 1/27/05 - 3/16/05 <sup>d</sup> ; 3/16/05 <sup>d</sup> - 3 PM 3/26/05; 9/1/05 - 12/31/05 | State season pot vessels >58   |
|                     | 1/1/06 - 2/28/06; 10/2/06 - 12/31/06  | Parallel season, all gear      |
|                     | 3/1/06 - 10/2/06  | State season jig               |
|                     | 3/1/06 - 5/1/06; 6/15/06 - 10/2/06  | State season pot vessels <58   |
|                     | 3/1/06 - 5/1/06; 6/15/06 - 10/2/06  | State season pot vessels >58   |

-continued-

Table 6.–Page 2 of 2.

| Year              | Dates and Times <sup>a</sup>                                      | Season and Gear                |
|-------------------|---|--------------------------------|
| 2007              | 1/1/07 - 2/27/07; 9/1/07 - 12/31/07                               | Parallel season, all gear      |
|                   | 2/28/07 - 12/31/07  | State season jigs              |
|                   | 2/28/07 - 5/1/07; 6/15/07 - 9/1/07                                | State season pot vessels <58   |
|                   | 2/28/07 - 5/1/07; 6/15/07 - 9/1/07                                | State season pot vessels >58   |
| 2008 <sup>b</sup> | 1/1/08 - 2/20/08; 9/1/08 - 10/3/08                                | Parallel season, all gear      |
|                   | 2/21/08 - 9/1/08; 10/4/08 - 12/31/08                              | State season jig               |
|                   | 2/21/08 - 5/1/08; 6/15/08 - 9/1/08; 10/4/08 - 12/31/08            | State season pot vessels <58   |
|                   | 2/21/08 - 10 AM 4/1/08; 10/4/08 - 12/31/08                        | State season pot vessels >58   |
| 2009 <sup>b</sup> | 1/1/09 - 1/27/09; 9/1/09 - 10/1/09                                | Parallel season, all gear      |
|                   | 1/28/09 - 9/1/09; 10/1/09 - 12/13/09                              | State season jig               |
|                   | 1/28/09 - 3/18/09; 10/1/09 - 12/31/09                             | State season pot vessels <58   |
|                   | 1/28/09 - 6:00 AM 3/18/09; 10/1/09 - 12/31/09                     | State season pot vessels >58   |
| 2010 <sup>b</sup> | 1/1/10 - 1/31/10; 9/1/10 - 9/13/10                                | Parallel season, all gear      |
|                   | 2/1/10 - 9/1/10; 9/13/10 - 12/31/10                               | State season jig               |
|                   | 2/1/10 - 4 PM 3/28/10; 9/13/10 - 12/31/10                         | State season pot (all vessels) |
| 2011              | 1/1/11 - 1/29/11; <i>expected to open September 1<sup>e</sup></i> | Parallel season, all gear      |
|                   | 1/30/11 - ongoing <sup>c</sup>                                    | State season jig               |
|                   | 1/30/11 - 3/19/11   | State season pot vessels <58   |
|                   | 1/30/11 - 3/13/11   | State season pot vessels >58   |

<sup>a</sup> Opening and closure times occurred at noon unless otherwise noted; except that openings on January 1 occurred at 12:01 am and closures on December 31 occurred at midnight.

<sup>b</sup> Gear and area registration requirements relaxed on October 31.

<sup>c</sup> New regulations became effective in 2005 limiting vessels >50' to 25% of the GHL.

<sup>d</sup> New regulations became effective 3/16/05 changing the allocation from 3% to 3.75% of the federal ABC.

<sup>e</sup> 2011 Season ongoing; state waters season open to jig gear; parallel season expected to open September 1.

Table 7.—Annual effort and harvest by gear type of Pacific cod from the Cook Inlet Area parallel fisheries, 1988–2010, and preliminary 2011 data through July 31.

| Year              | Vessels | Landings | Harvest (lb) <sup>a</sup> |           |              |                  | Total                  |
|-------------------|---------|----------|---------------------------|-----------|--------------|------------------|------------------------|
|                   |         |          | Other <sup>b</sup>        | Longline  | Pot          | Jig <sup>c</sup> |                        |
| 1988              | 59      | 213      | <sup>d</sup>              | 482,365   | <sup>d</sup> | <sup>d</sup>     | 517,497                |
| 1989              | 9       | 21       |                           | 35,978    | <sup>d</sup> | <sup>d</sup>     | 36,846                 |
| 1990              | 52      | 127      | 107,505                   | 250,888   | 20,244       | <sup>d</sup>     | 378,637 <sup>e</sup>   |
| 1991              | 122     | 489      | 25,819                    | 1,347,759 | 525,774      | 17,284           | 1,916,636              |
| 1992              | 190     | 868      |                           | 3,553,709 | 1,873,717    | 13,995           | 5,441,421              |
| 1993              | 109     | 427      | 8,454                     | 2,316,492 | 1,336,799    |                  | 3,661,744              |
| 1994              | 74      | 386      | <sup>d</sup>              | 1,386,775 | 1,290,860    | 5,487            | 2,685,562              |
| 1995              | 140     | 669      | 433,528                   | 2,250,472 | 1,721,079    | 3,572            | 4,408,651              |
| 1996              | 106     | 567      | 1,411,726                 | 2,219,948 | 987,626      | 25,645           | 4,644,945              |
| 1997              | 137     | 576      | 72,354                    | 2,049,394 | 1,114,131    | 37,362           | 3,273,240              |
| 1998              | 116     | 519      | 211,406                   | 1,900,375 | 529,355      | 42,453           | 2,683,589              |
| 1999              | 112     | 457      | 8,296                     | 2,171,877 | 981,674      | 21,331           | 3,183,178              |
| 2000              | 101     | 417      |                           | 815,742   | 770,298      | <sup>d</sup>     | 1,586,041 <sup>e</sup> |
| 2001              | 86      | 243      |                           | 301,654   | 314,098      |                  | 615,752                |
| 2002              | 65      | 222      |                           | 582,635   | 307,937      | <sup>d</sup>     | 890,573 <sup>e</sup>   |
| 2003              | 45      | 142      |                           | 126,168   | 294,630      |                  | 420,798                |
| 2004              | 62      | 133      |                           | 27,026    | 360,637      | <sup>d</sup>     | 387,662 <sup>e</sup>   |
| 2005              | 44      | 118      |                           | 25,720    | 167,320      | <sup>d</sup>     | 193,040 <sup>e</sup>   |
| 2006              | 51      | 171      |                           | 70,507    | 520,613      |                  | 591,121                |
| 2007              | 47      | 202      |                           | 364,427   | 328,878      |                  | 693,305                |
| 2008              | 52      | 161      |                           | 267,991   | 145,473      |                  | 413,464                |
| 2009              | 57      | 172      |                           | 452,796   | 88,657       |                  | 541,453                |
| 2010              | 50      | 124      |                           | 197,795   | 228,429      | <sup>d</sup>     | 426,223 <sup>e</sup>   |
| 2011 <sup>f</sup> | 32      | 77       |                           | 140,307   | 450,631      |                  | 590,938                |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> “Other” includes trawl and gillnet gear.

<sup>c</sup> Includes mechanical jig and hand troll.

<sup>d</sup> Confidential data due to limited number of participants.

<sup>e</sup> Total harvest does not include confidential data.

<sup>f</sup> Preliminary data through July 31, 2011.

Table 8.—Annual harvest and value for the Cook Inlet Area Pacific cod parallel and state-waters seasons, 1988–2010.

| Year              | Price per lb | Parallel Season Harvest (lb) <sup>ab</sup> | Parallel Season Value | State-waters Season Harvest (lb) <sup>a</sup> | State-waters Season Value | Total Combined Pacific cod Fishery Value |
|-------------------|--------------|--|-----------------------|---|---------------------------|--|
| 1988              | \$0.21       | 517,497                                    | \$108,674             |   |                           | \$108,674                                |
| 1989              | \$0.07       | 36,846                                     | \$2,579               |   |                           | \$2,579                                  |
| 1990              | \$0.13       | 378,799                                    | \$49,244              |   |                           | \$49,244                                 |
| 1991              | \$0.27       | 1,916,636                                  | \$517,492             |   |                           | \$517,492                                |
| 1992              | \$0.23       | 5,441,421                                  | \$1,251,527           |   |                           | \$1,251,527                              |
| 1993              | \$0.24       | 3,661,744                                  | \$878,819             |   |                           | \$878,819                                |
| 1994              | \$0.19       | 2,685,562                                  | \$510,257             |   |                           | \$510,257                                |
| 1995              | \$0.24       | 4,408,651                                  | \$1,058,076           |   |                           | \$1,058,076                              |
| 1996              | \$0.24       | 4,644,945                                  | \$1,114,787           |   |                           | \$1,114,787                              |
| 1997 <sup>c</sup> | \$0.27       | 3,273,240                                  | \$883,775             | 838,913                                       | \$226,507                 | \$1,110,281                              |
| 1998              | \$0.24       | 2,683,589                                  | \$644,061             | 730,469                                       | \$175,313                 | \$819,374                                |
| 1999              | \$0.37       | 3,183,178                                  | \$1,177,776           | 1,517,907                                     | \$561,625                 | \$1,739,401                              |
| 2000              | \$0.40       | 1,587,390                                  | \$634,956             | 1,149,788                                     | \$459,915                 | \$1,094,871                              |
| 2001              | \$0.39       | 615,752                                    | \$240,143             | 895,351                                       | \$349,187                 | \$589,330                                |
| 2002              | \$0.33       | 891,970                                    | \$294,350             | 1,328,847                                     | \$438,520                 | \$732,869                                |
| 2003              | \$0.37       | 420,798                                    | \$155,695             | 1,453,538                                     | \$537,809                 | \$693,504                                |
| 2004              | \$0.32       | 387,902                                    | \$124,129             | 2,111,685                                     | \$675,739                 | \$799,868                                |
| 2005              | \$0.31       | 193,075                                    | \$59,853              | 2,318,151                                     | \$718,627                 | \$778,480                                |
| 2006              | \$0.43       | 591,121                                    | \$254,182             | 1,477,521                                     | \$635,334                 | \$889,516                                |
| 2007              | \$0.49       | 693,305                                    | \$339,720             | 1,442,349                                     | \$706,751                 | \$1,046,471                              |
| 2008              | \$0.60       | 413,464                                    | \$248,079             | 2,393,541                                     | \$1,436,125               | \$1,684,203                              |
| 2009              | \$0.34       | 541,453                                    | \$184,094             | 2,532,535                                     | \$861,062                 | \$1,045,156                              |
| 2010              | \$0.29       | 426,241                                    | \$123,610             | 3,123,626                                     | \$905,852                 | \$1,029,461                              |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes Pacific cod bycatch to other directed groundfish and halibut fisheries in state waters.

<sup>c</sup> State-waters season implemented in 1997.

Table 9.—Annual effort, guideline harvest level (GHL), and harvest by gear type of Pacific cod from the Cook Inlet Area state-waters season, 1997–2010, and preliminary 2011 data.

| Year              | All Gear |          |                        |           | Pot          |              |              | Jig          |              |                           |
|-------------------|----------|----------|------------------------|-----------|--------------|--------------|--------------|--------------|--------------|---------------------------|
|                   | Vessels  | Landings | Harvest (lb)           | GHL (lb)  | Vessels      | Landings     | Harvest (lb) | Vessels      | Landings     | Harvest (lb) <sup>b</sup> |
| 1997              | 55       | 367      | 838,913                | 2,549,646 | 10           | 136          | 276,966      | 46           | 233          | 561,947                   |
| 1998              | 42       | 306      | 730,469                | 2,434,565 | 13           | 183          | 542,260      | 29           | 123          | 188,209                   |
| 1999              | 38       | 329      | 1,517,907              | 2,637,445 | 24           | 278          | 1,390,678    | 14           | 51           | 127,229                   |
| 2000              | 21       | 331      | 1,149,788              | 2,160,255 | 17           | 219          | 1,135,903    | 5            | 12           | 13,885                    |
| 2001              | 14       | 209      | 895,351                | 1,917,195 | 9            | 196          | 875,923      | 5            | 13           | 19,428                    |
| 2002              | 15       | 321      | 1,328,847              | 1,571,455 | 9            | 306          | 1,310,684    | 6            | 15           | 18,163                    |
| 2003              | 19       | 300      | 1,453,538              | 1,438,516 | 10           | 140          | 1,023,854    | 15           | 160          | 429,684                   |
| 2004              | 25       | 290      | 2,111,685              | 2,367,765 | 12           | 170          | 1,785,386    | 18           | 120          | 326,298                   |
| 2005              | 17       | 233      | 2,318,151              | 2,737,893 | 10           | 205          | 2,227,417    | 8            | 28           | 90,734                    |
| 2006              | 12       | 149      | 1,476,115 <sup>d</sup> | 3,131,088 | <sup>c</sup> | <sup>c</sup> | 1,476,115    | <sup>c</sup> | <sup>c</sup> | <sup>c</sup>              |
| 2007              | 17       | 152      | 1,442,349              | 3,131,088 | 13           | 145          | 1,436,804    | 4            | 7            | 5,545                     |
| 2008              | 16       | 234      | 2,393,541              | 3,133,403 | 13           | 227          | 2,379,085    | 3            | 7            | 14,456                    |
| 2009              | 18       | 222      | 2,532,535              | 2,606,393 | 13           | 181          | 2,393,574    | 9            | 41           | 138,960                   |
| 2010              | 15       | 148      | 3,123,626              | 4,054,466 | 9            | 128          | 3,074,871    | 6            | 20           | 48,754                    |
| 2011 <sup>e</sup> | 35       | 315      | 3,987,659              | 4,449,911 | 9            | 124          | 3,495,639    | 29           | 187          | 492,020                   |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes mechanical jig and hand troll.

<sup>c</sup> Confidential data due to limited number of participants.

<sup>d</sup> Total harvest does not include confidential data.

<sup>e</sup> Preliminary data through July 31, 2011; state-waters season currently open to jig gear.

Table 10.—Annual guideline harvest level (GHL), harvest by gear type, and percent of GHL harvested by gear type of Pacific cod from Cook Inlet Area state-waters season, 1997–2010, and preliminary 2011 data.

| Year              | GHL       | Harvest (lb) <sup>a</sup> |              |           |           |                  |              |
|-------------------|-----------|---------------------------|--------------|-----------|-----------|------------------|--------------|
|                   |           | Total                     | Total % GHL  | Pot       | Pot % GHL | Jig <sup>b</sup> | Jig % GHL    |
| 1997              | 2,549,646 | 838,913                   | 33%          | 276,966   | 11%       | 561,947          | 22.0%        |
| 1998              | 2,434,565 | 730,469                   | 30%          | 542,260   | 22%       | 188,209          | 7.7%         |
| 1999              | 2,637,445 | 1,517,907                 | 58%          | 1,390,678 | 53%       | 127,229          | 4.8%         |
| 2000              | 2,160,255 | 1,149,788                 | 53%          | 1,135,903 | 53%       | 13,885           | 0.6%         |
| 2001              | 1,917,195 | 895,351                   | 47%          | 875,923   | 46%       | 19,428           | 1.0%         |
| 2002              | 1,571,455 | 1,328,847                 | 85%          | 1,310,684 | 83%       | 18,163           | 1.2%         |
| 2003              | 1,438,516 | 1,453,538                 | 101%         | 1,023,854 | 71%       | 429,684          | 29.9%        |
| 2004              | 2,367,765 | 2,111,685                 | 89%          | 1,785,386 | 75%       | 326,298          | 13.8%        |
| 2005              | 2,737,893 | 2,318,151                 | 85%          | 2,227,417 | 81%       | 90,734           | 3.3%         |
| 2006              | 3,131,088 | <sup>c</sup>              | <sup>c</sup> | 1,476,115 | 47%       | <sup>c</sup>     | <sup>c</sup> |
| 2007              | 3,131,088 | 1,442,349                 | 46%          | 1,436,804 | 46%       | 5,545            | 0.2%         |
| 2008              | 3,133,403 | 2,393,541                 | 76%          | 2,379,085 | 76%       | 14,456           | 0.5%         |
| 2009              | 2,606,393 | 2,532,535                 | 97%          | 2,393,574 | 92%       | 138,960          | 5.3%         |
| 2010              | 4,054,466 | 3,123,626                 | 77%          | 3,074,871 | 76%       | 48,754           | 1.2%         |
| 2011 <sup>d</sup> | 4,449,911 | 3,987,659                 | 90%          | 3,495,639 | 79%       | 492,020          | 11.1%        |

<sup>a</sup> Harvest is reported in round pounds.

<sup>b</sup> Includes mechanical jig and hand troll.

<sup>c</sup> Confidential data due to limited number of participants.

<sup>d</sup> Preliminary data through July 31, 2011; state-waters season currently open to jig gear.

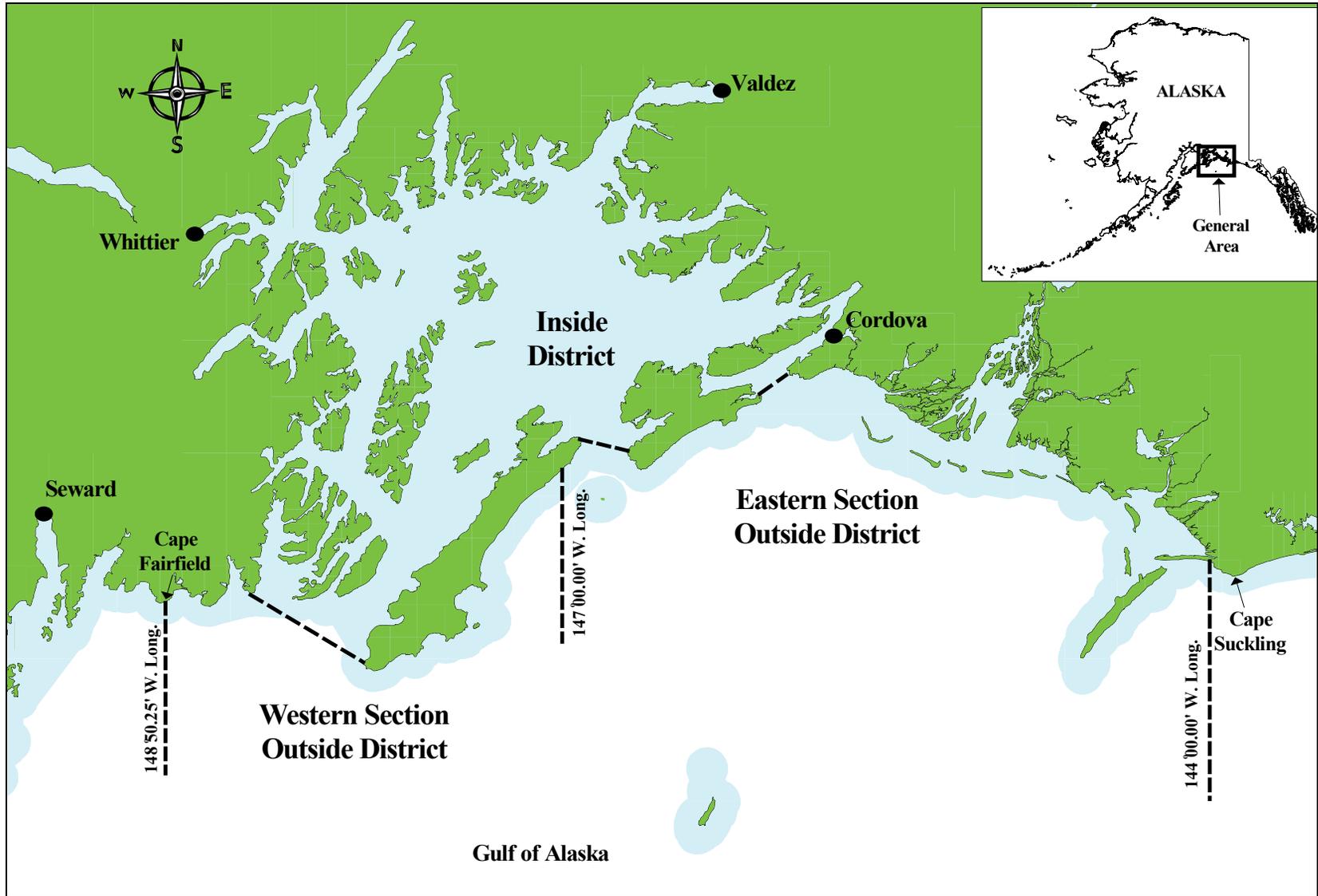


Figure 1.—Groundfish fishing districts of the Prince William Sound Management Area.

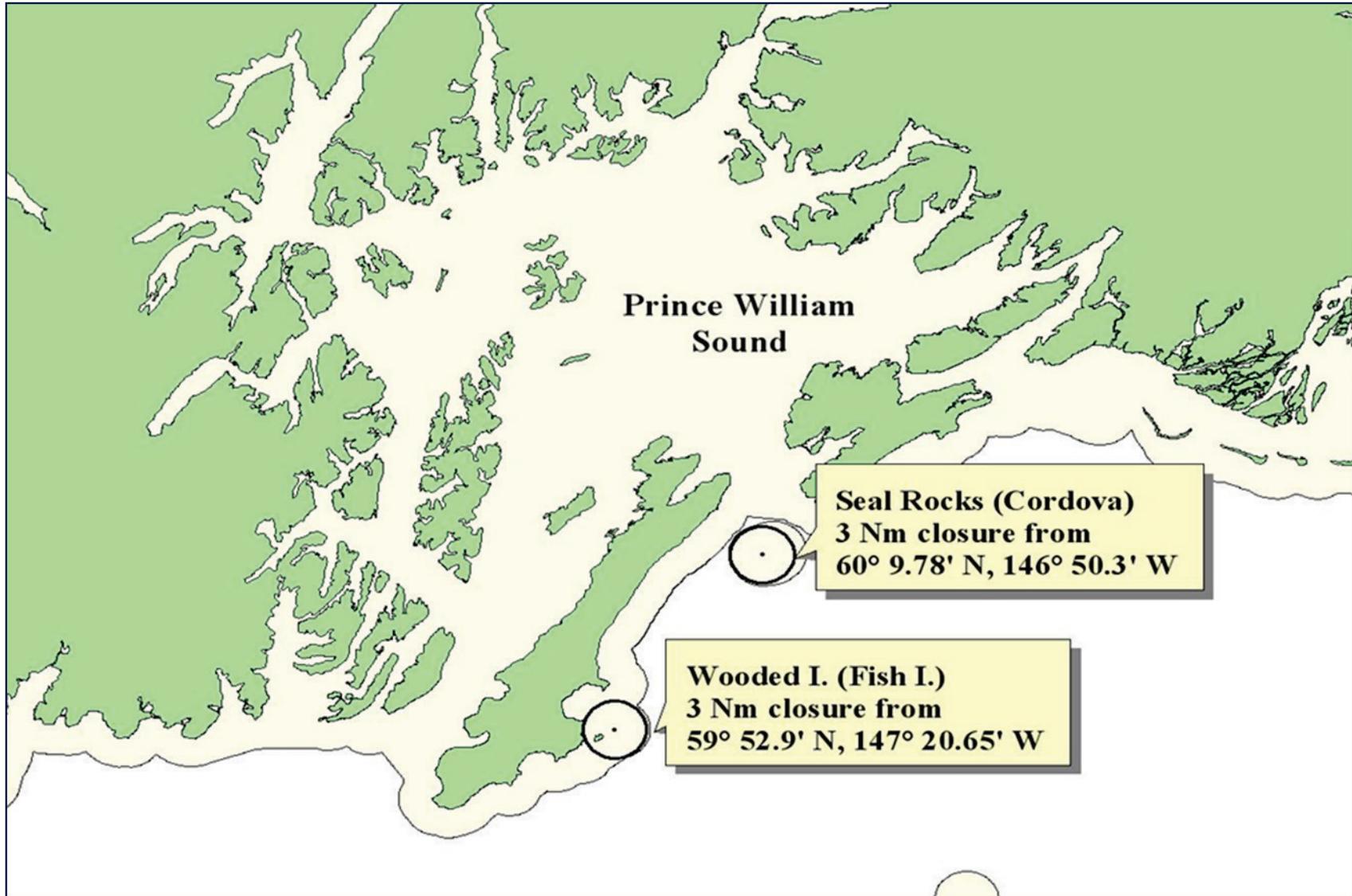


Figure 2.—Prince William Sound groundfish fishing closures implemented for Steller sea lion protection.

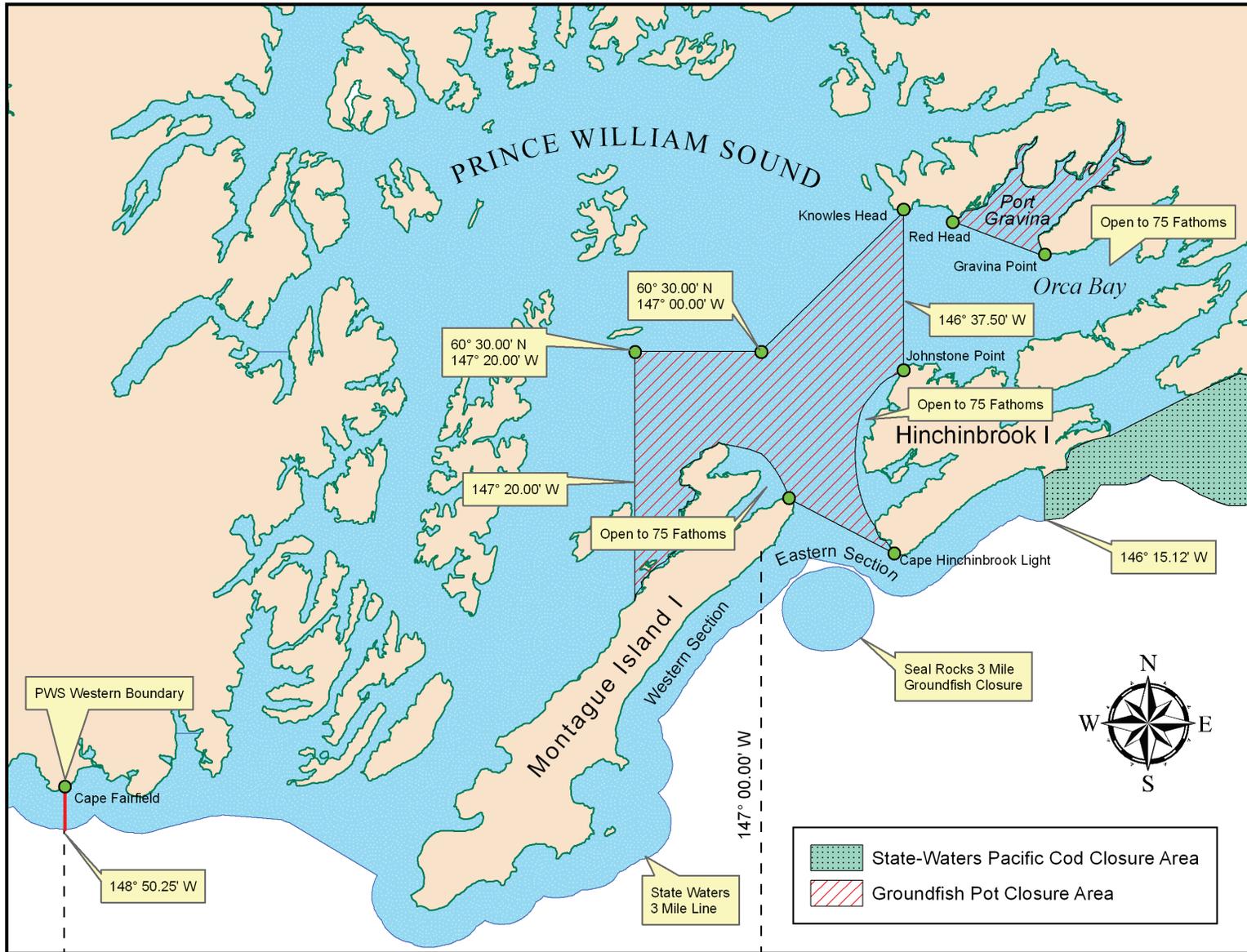


Figure 3.—Groundfish pot closure areas in the Prince William Sound Management Area.

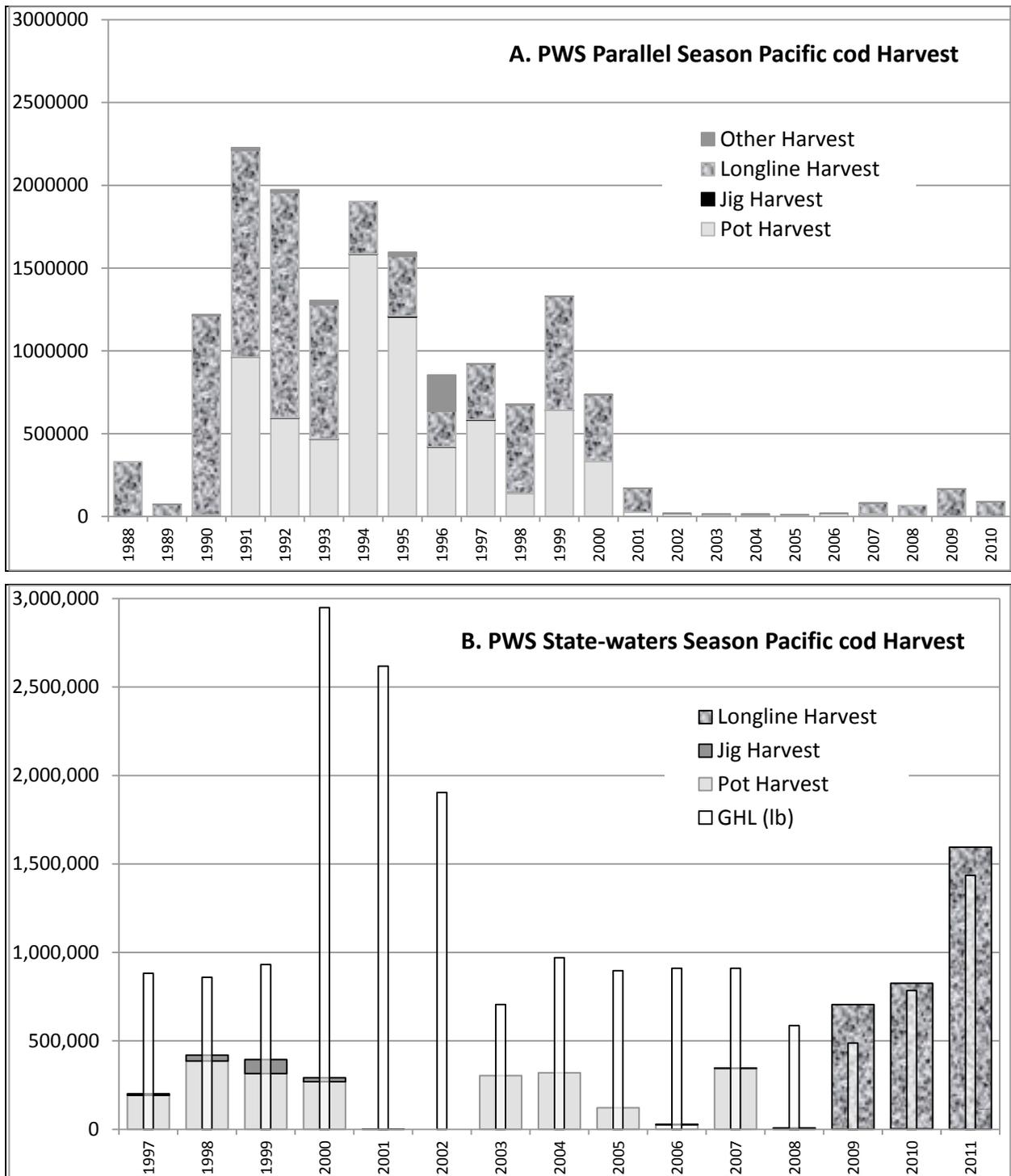


Figure 4.—Pacific cod harvest (in round pounds) by gear type in the Prince William Sound (PWS) parallel season, 1988–2010 (A), and PWS state-waters season with GHLs, 1997–2011 (B).

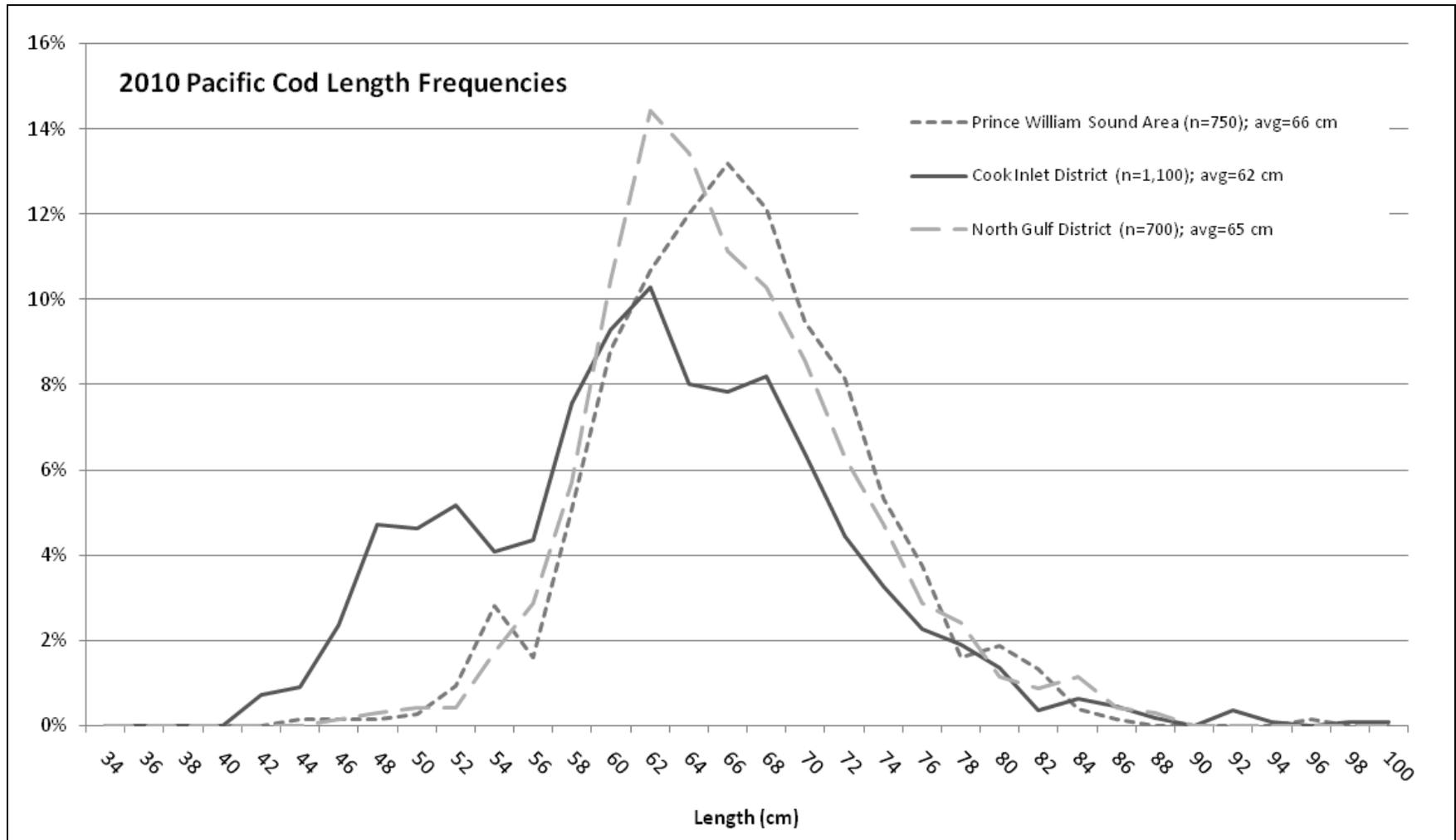
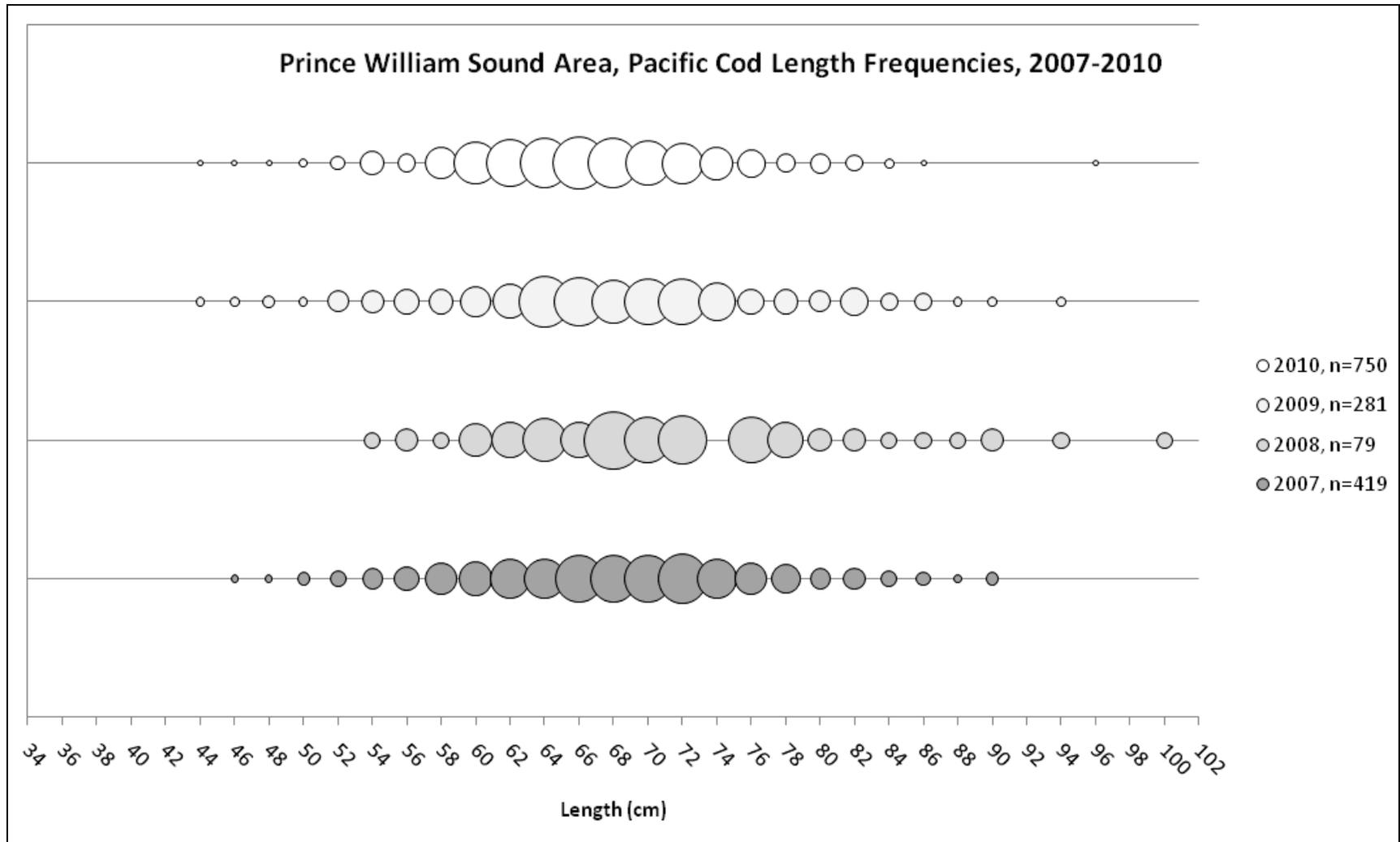


Figure 5.—Pacific cod lengths from the 2010 state-waters fisheries in the Prince William Sound Area, and the Cook Inlet and North Gulf districts of the Cook Inlet Area.



*Note:* Percent represented by bubble area.

Figure 6.—Pacific cod length frequencies from the Prince William Sound Area, 2007–2010.

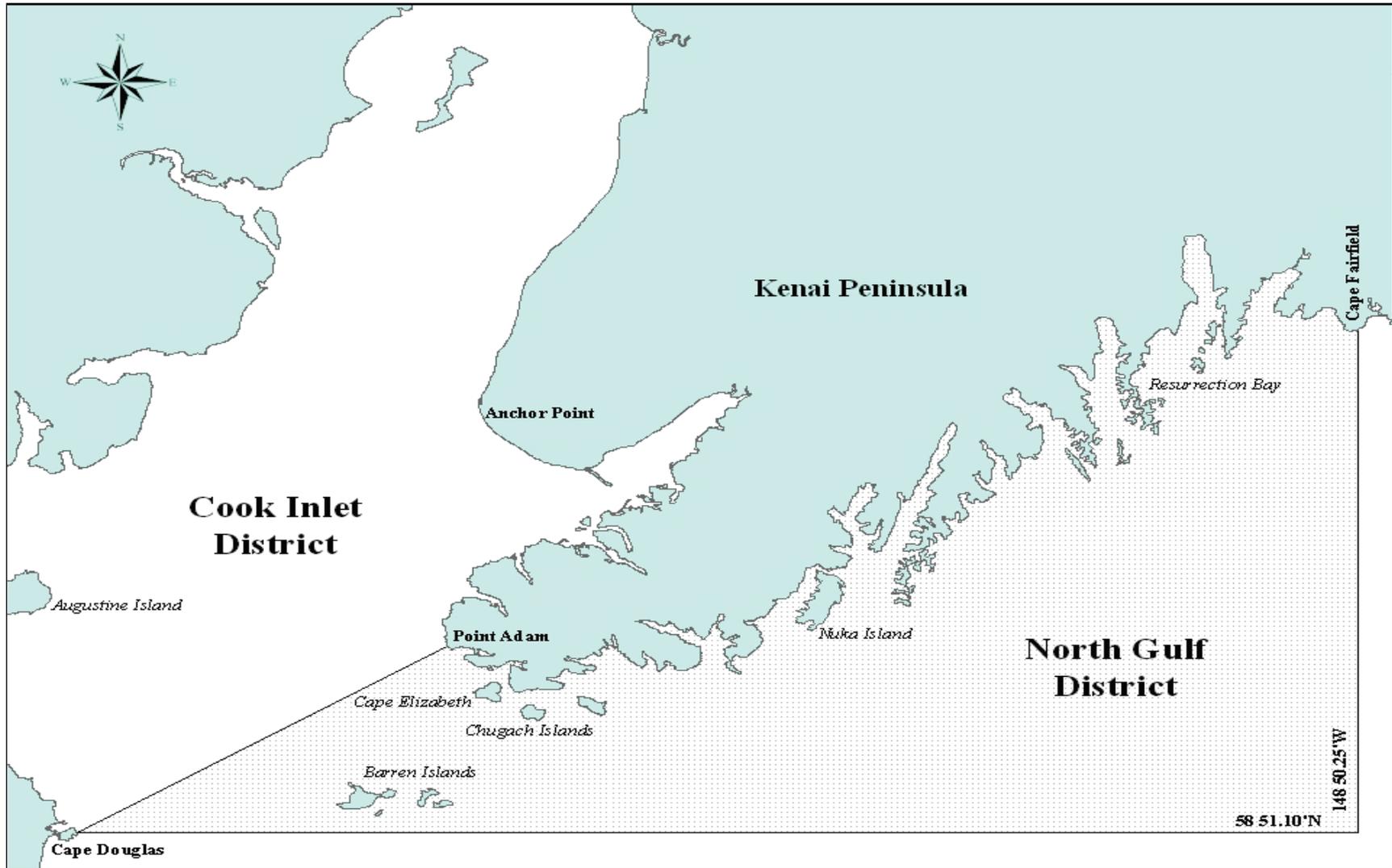


Figure 7.—Cook Inlet Area commercial groundfish area and district boundaries from 1997 to present.

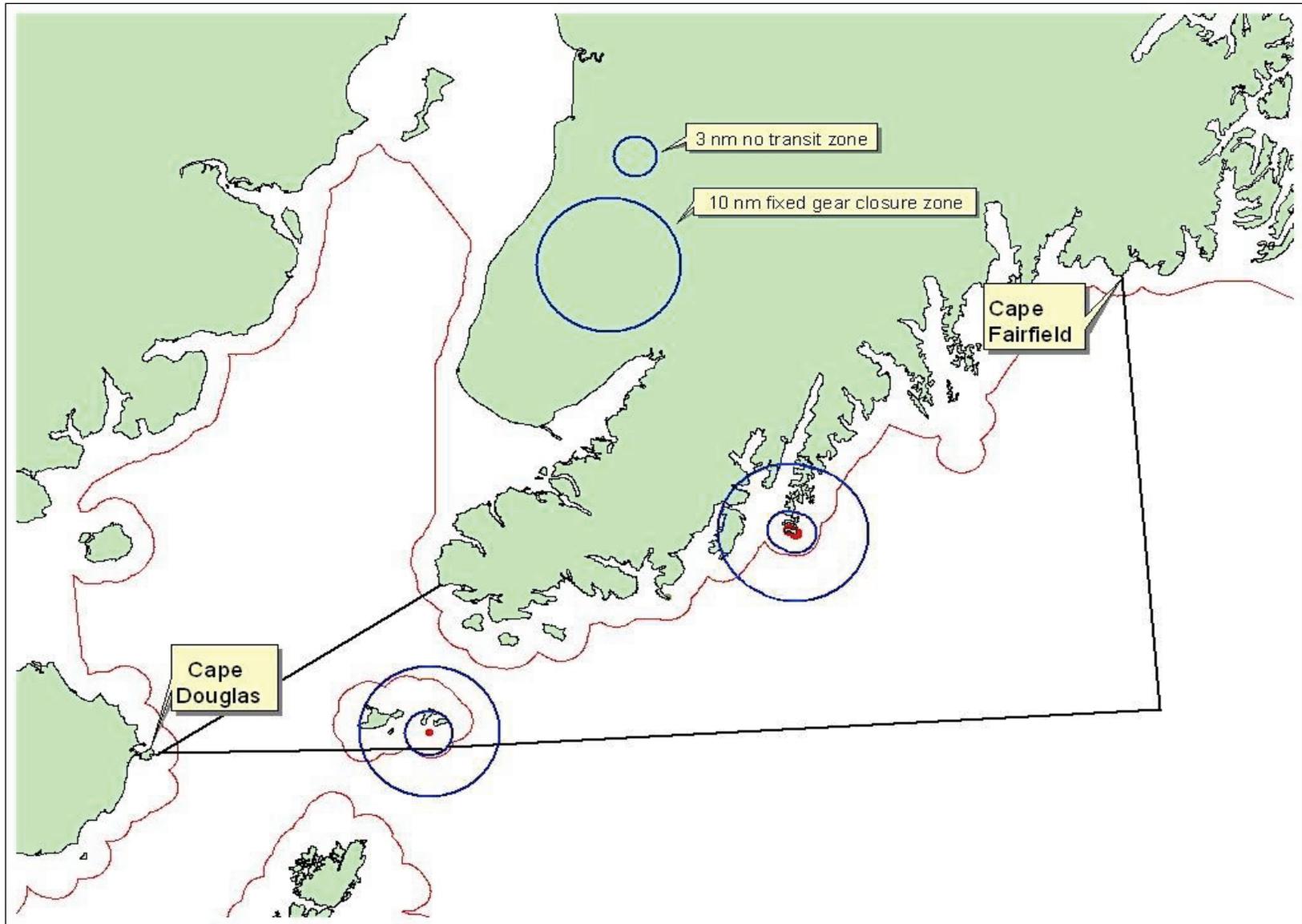


Figure 8.—Vessel no-transit and fixed gear Pacific cod fishing closure zones around Steller sea lion rookeries within the Cook Inlet Management Area.



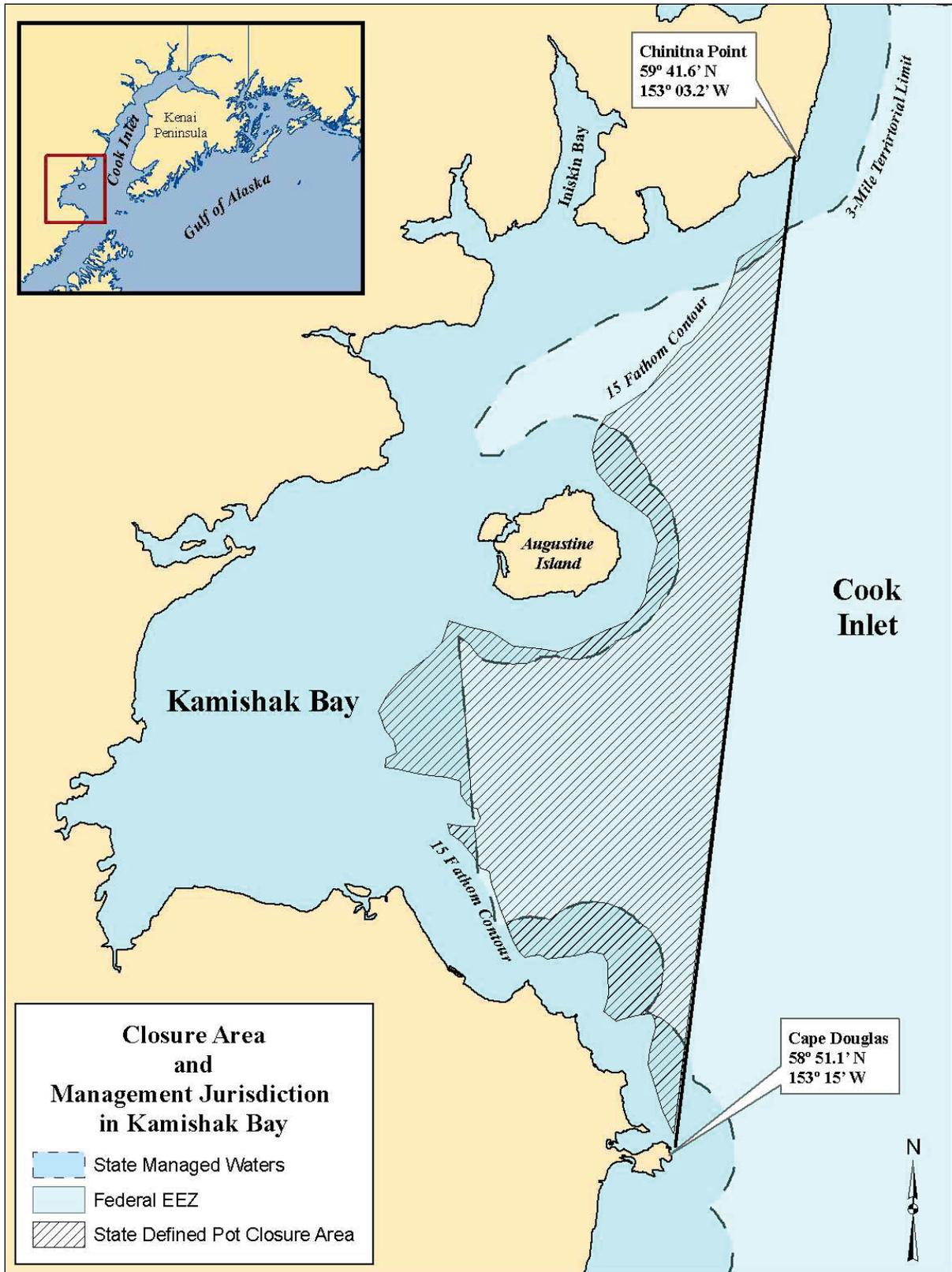
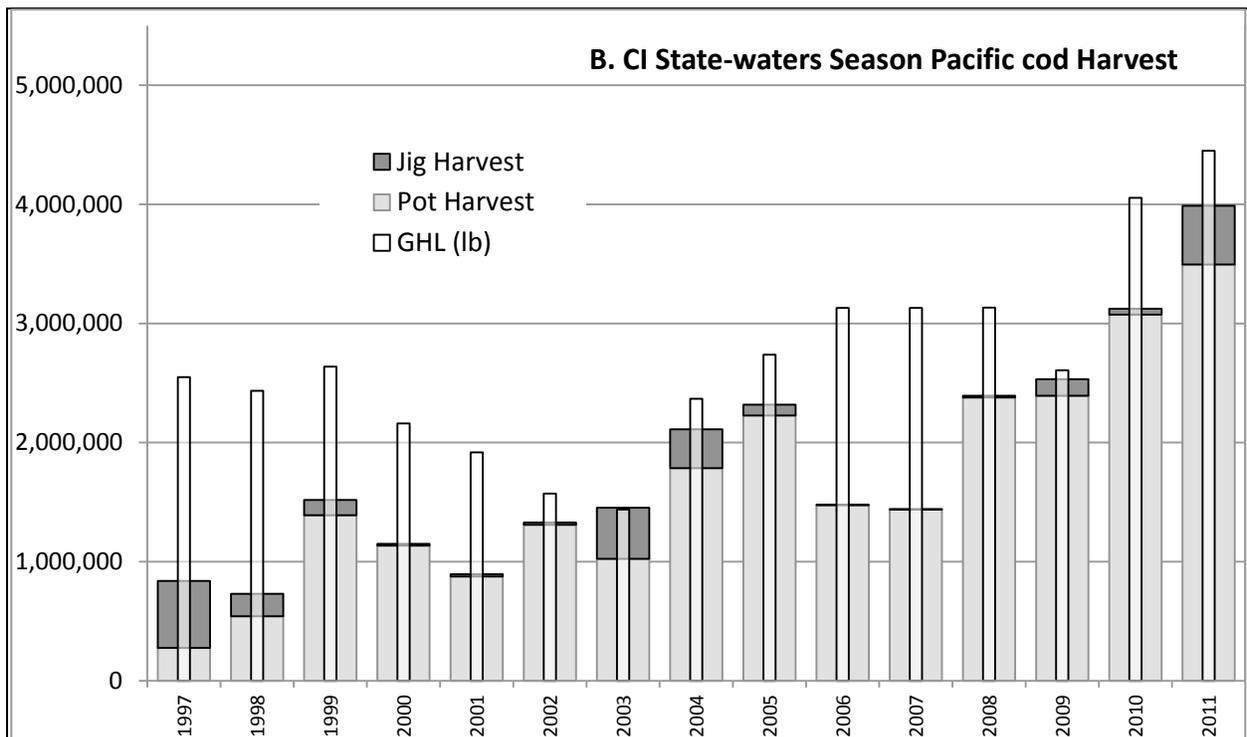
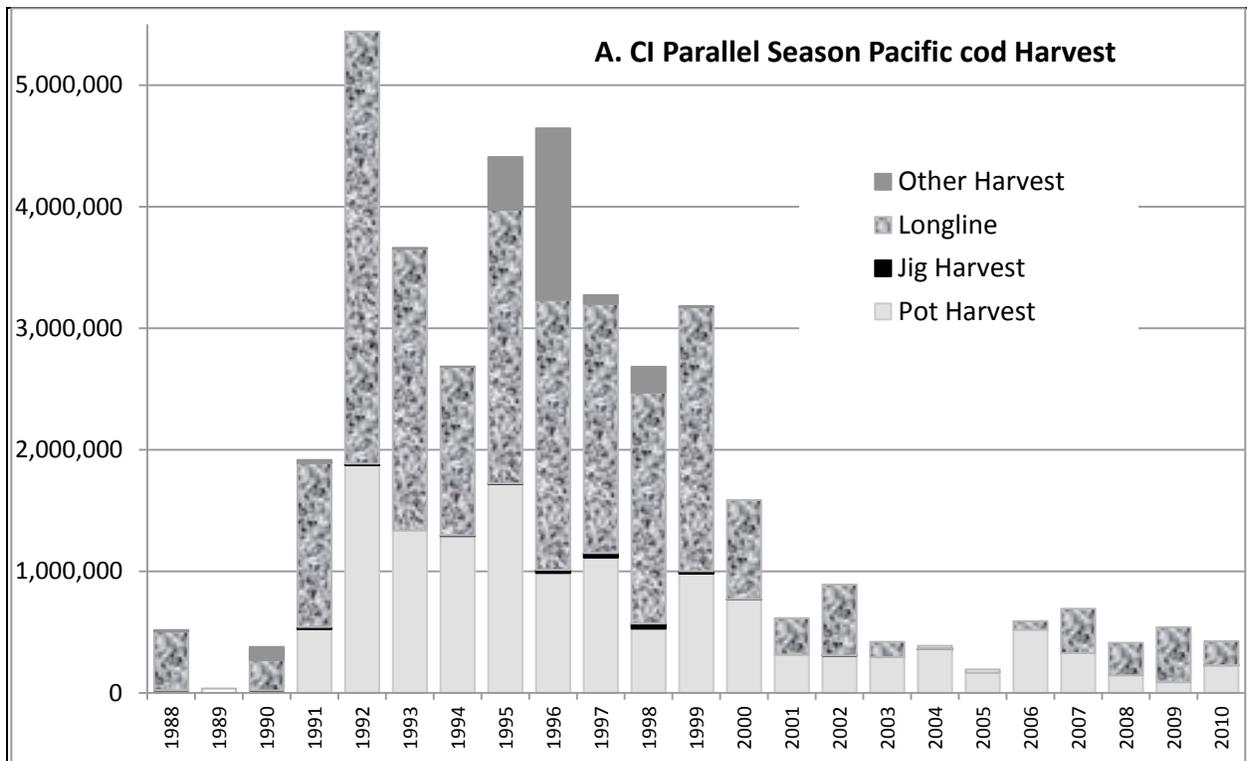
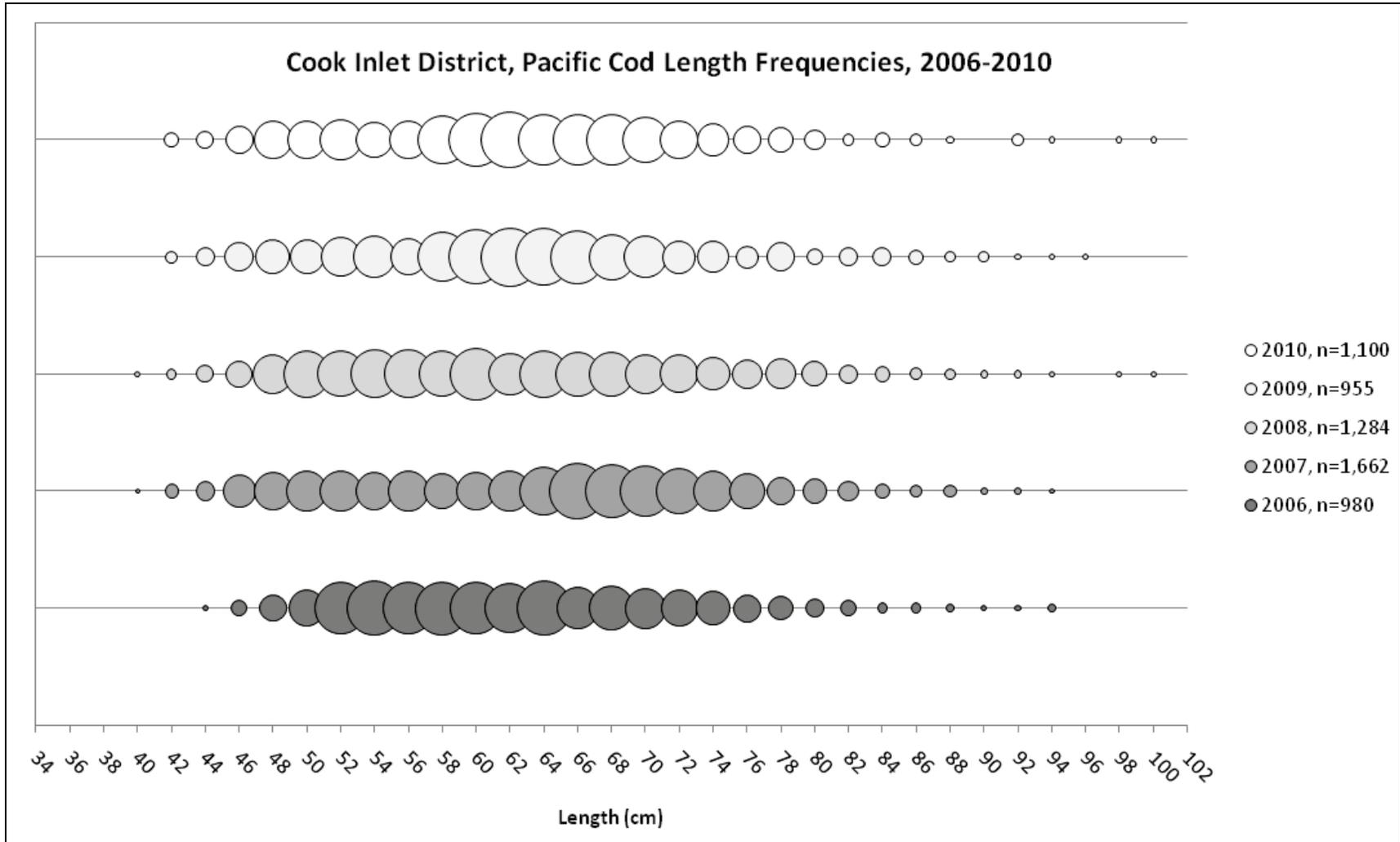


Figure 10.—Kamishak Bay groundfish pot closure area.



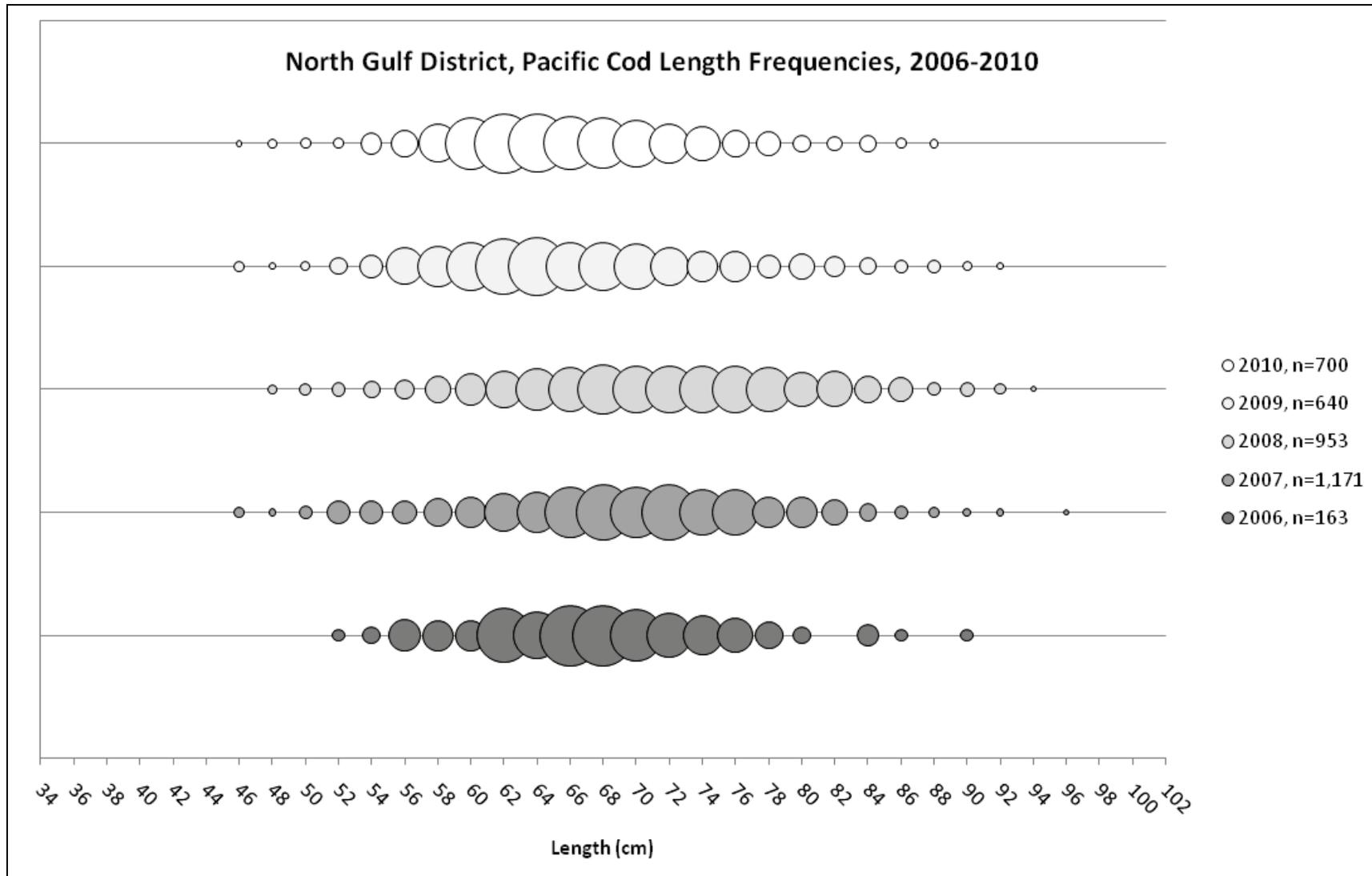
Note: 2011 data are preliminary.

Figure 11.—Pacific cod harvest (in round pounds) by gear type in the Cook Inlet (CI) parallel season, 1988–2010 (A), and CI state-waters season with GHLs, 1997–2011 (B).



*Note:* Percent represented by bubble area.

Figure 12.—Pacific cod length frequencies from the Cook Inlet District of the Cook Inlet Area, 2006–2010.



*Note:* Percent represented by bubble area.

Figure 13.—Pacific cod length frequencies from the North Gulf District of the Cook Inlet Area, 2006–2010.

## **APPENDIX A.**

Appendix A1.–Frequently used acronyms and key words.

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| Acronym              | Definition   |
|----------------------|--|
| ABC                  | Acceptable biological catch, stock specification as set annually by the NPFMC.   |
| ADF&G                | Alaska Department of Fish and Game   |
| BOF                  | The Alaska Board of Fisheries  |
| CGOA                 | Central Gulf of Alaska; management areas 620 and 630   |
| EGOA                 | Eastern Gulf of Alaska; management area 640  |
| EEZ                  | Exclusive economic zone; from 3 to 200 nautical miles offshore   |
| EO                   | Emergency order, management action taken by ADF&G to effect regulatory change  |
| GHL                  | Guideline harvest level  |
| GOA                  | Gulf of Alaska   |
| mt                   | Metric tons (equal to 2,204.62 pounds)   |
| nmi                  | Nautical mile (equal to 6,076 feet)  |
| NMFS                 | National Marine Fisheries Service  |
| NPFMC                | North Pacific Fishery Management Council   |
| Parallel fishery     | State waters from 0 to 3 nautical miles opened via EO but with the same gear and seasons that apply to the federal fishery in the adjacent EEZ |
| State waters         | Territorial sea from shore to 3 nautical miles offshore  |
| State-waters fishery | Fishery occurring from shore to 3 nautical miles, open under state rules and managed exclusively by ADF&G                                      |
| TAC                  | Total allowable catch, final federal harvest specification as recommended by NPFMC and set by NMFS   |

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