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**Updated Overview of State-Managed Fisheries in the  
Central and Western Gulf Of Alaska, Aleutian  
Islands, and Southeastern Bering Sea with Reference  
to Steller Sea Lions**

by

**Doug Woodby**

and

**Lee Hulbert**

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September 2006

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



## Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

<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	<i>e</i>
		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	e.g.	degrees of freedom	df
pound	lb	(for example)		expected value	<i>E</i>
quart	qt	Federal Information Code	FIC	greater than	>
yard	yd	id est (that is)	i.e.	greater than or equal to	≥
		latitude or longitude	lat. or long.	harvest per unit effort	HPUE
<b>Time and temperature</b>		monetary symbols		less than	<
day	d	(U.S.)	\$, ¢	less than or equal to	≤
degrees Celsius	°C	months (tables and figures): first three letters	Jan, ..., Dec	logarithm (natural)	ln
degrees Fahrenheit	°F	registered trademark	®	logarithm (base 10)	log
degrees kelvin	K	trademark	™	logarithm (specify base)	log <sub>2</sub> , etc.
hour	h	United States (adjective)	U.S.	minute (angular)	'
minute	min	United States of America (noun)	USA	not significant	NS
second	s	U.S.C.	United States Code	null hypothesis	H <sub>0</sub>
		U.S. state	use two-letter abbreviations (e.g., AK, WA)	percent	%
<b>Physics and chemistry</b>				probability	P
all atomic symbols				probability of a type I error (rejection of the null hypothesis when true)	$\alpha$
alternating current	AC			probability of a type II error (acceptance of the null hypothesis when false)	$\beta$
ampere	A			second (angular)	"
calorie	cal			standard deviation	SD
direct current	DC			standard error	SE
hertz	Hz			variance	
horsepower	hp			population	Var
hydrogen ion activity (negative log of)	pH			sample	var
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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SEA LIONS**

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## ABSTRACT

This report provides an update of a document prepared by Kruse et al. (2000) to provide information to the National Marine Fisheries Service on state-managed fisheries for consideration in National Marine Fisheries Service's analysis of the potential cumulative impacts of all fisheries on the endangered status of the western population of Steller sea lions. Specifically, this report updates the information provided in the 2000 report to answer 11 questions posed by the National Marine Fisheries Service: (1) what fisheries occur? (2) when does each fishery occur? (3) where does each fishery occur? (4) what are the status and trends of the fished stock? (5) what is the biomass available? (6) what are the stock assessment methods? (7) what is the landed harvest? (8) what methods are used to monitor and assess landings? (9) what is the harvest rate? (10) what gear types are used? and (11) what interactions occur with Steller sea lions?

This update highlights changes in the past 6 years and provides harvest amounts and location information for the 2005 season (2005/2006 for shellfish where appropriate). Sideboards and caveats regarding the data and their interpretation remain the same in this report as for the 2000 report: the scope is largely confined to fisheries occurring in the Gulf of Alaska west of 144° W longitude and in the Aleutian Islands and southeastern Bering Sea, encompassing the primary region of the National Marine Fisheries Service concern about Steller sea lions. The primary source of data was the fish ticket database, which in most cases provides information on landed catch and not catch discarded prior to landing. Hence, the term catch as used in this report means landed catch. In a departure from the 2000 report, this update includes information on the "parallel" groundfish fisheries prosecuted in state waters during federal groundfish openings.

Herring fishery harvests have declined somewhat from levels in the previous decade but were otherwise largely unchanged from those described in the 2000 report. Alaskan herring harvests west of 144° W longitude have stabilized around an average of about 22 thousand metric tons in the past 5 years. Harvests are mostly by purse seines (73%) and to a lesser extent by gillnets (27%) in fisheries occurring in brief periods in the spring when herring move to shorelines to spawn. There has been no trawling for herring since 1997.

Salmon harvests reached an all time high in 2005, marking an upward trend beginning in the late 1970s following the imposition of limited entry and the 1977 ecosystem regime shift. This latest peak was driven largely by increased catches of pink salmon in the central and eastern Gulf of Alaska, and coincides with improving markets.

The status of invertebrate fisheries has changed in a few notable ways in recent years. Management of Bering Sea and Aleutian Islands crab came under rationalization in 2005, with the effect of designating quota shares of crab to individual harvesters and to processors. Status of stocks has changed as well, with several Tanner crab fisheries reopening, including fisheries in Kodiak, Chignik, South Alaska Peninsula, eastern Aleutian Islands, and eastern Bering Sea management areas. The Bering Sea hair crab fishery was closed in 2005, and crab fisheries in Prince William Sound and Cook Inlet remained closed, as did the Kodiak and Pribilof Islands red king crab fisheries, and blue king crab fisheries near the Pribilof Islands and St. Matthew Island. Fisheries for other invertebrates, including shrimp, scallops, sea cucumbers, and clams continued at modest levels, as reported in 2000.

Several state-managed groundfish fisheries have seen a declining trend in the last 6 years, including the Prince William Sound pollock fishery and fisheries for sablefish and rockfish. A new Pacific cod fishery, allowing trawl gear, began in March, 2006 in the central Aleutians.

Overall, there is little new information on direct interactions between state-managed fisheries and Steller sea lions, including information on incidental mortality. Outside of the scallop fishery, observers are not required on vessels participating in these fisheries. By virtue of the nearshore designation of Steller sea lions critical habitat, much of state waters coincide with that habitat. The degree of overlap between state-managed fisheries and critical habitat varies among fisheries and areas, but in general, the most extensive overlap occurs in waters from Kodiak westward to the Alaska Peninsula, including primarily groundfish fisheries for cod and rockfish and pot fisheries for crab.

Key words: Steller sea lions; biomass, stock assessment; harvest; shellfish; Gulf of Alaska; Aleutian Islands; Bering Sea; groundfish; herring; salmon; crab; Pollock; sablefish; rockfish; critical habitat; pot fishery

# INTRODUCTION

## PURPOSE AND SCOPE OF REPORT

The purpose of this document is to provide an update of a report prepared by the Alaska Department of Fish and Game in October, 2000, on state-managed commercial fisheries with information on potential impacts on Steller sea lion (SSL) populations. The citation of that report is:

Kruse, G. H., F. C. Funk, H. J. Geiger, K. R. Mabry, H. M. Savikko, and S. M. Siddeek. 2000. Overview of state-managed marine fisheries in the central and western Gulf of Alaska, Aleutian Islands, and Southeastern Bering Sea, with reference to Steller sea lions. Regional Information Report 5J00-10, Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

The 2000 report was prepared to provide information to the National Marine Fisheries Service (NMFS) on state-managed fisheries for consideration in NMFS's analysis of the potential cumulative impacts of all fisheries on the endangered status of the western population of SSL. Specifically, the 2000 report provided answers to 11 questions posed by NMFS:

- (1) what fisheries occur?
- (2) when does each fishery occur?
- (3) where does each fishery occur?
- (4) what are the status and trends of the fished stock?
- (5) what is the biomass available?
- (6) what are the stock assessment methods?
- (7) what is the landed harvest?
- (8) what methods are used to monitor and assess landings?
- (9) what is the harvest rate?
- (10) what gear types are used? and
- (11) what interactions occur with SSL?

This update document addresses those same 11 questions, and highlights noteworthy changes in the answers to those questions. There are several types of information that were presented adequately in the 2000 report that are not repeated here: fishery history, overview description of the fishery, fishery management strategy, and fishing gear, except where there have been notable changes (e.g., the 2006 Pacific cod fishery in the Aleutians). It is expected that readers will refer to the original review by Kruse et al. (2000<sup>1</sup>), including the numerous graphs and several tables, to best understand the commentary provided here regarding changes.

All of the limitations and caveats identified in the introduction to the 2000 report apply here, and are included by reference. Principal among these are the following. The scope of this report is limited to a focus on commercial fisheries in the region of concern for the western population of the SSL: the central and western Gulf of Alaska, west of 144° W longitude, the Aleutian Islands

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<sup>1</sup> available online at <http://www.cf.adfg.state.ak.us/geninfo/pubs/rir/5j00-10/5j00-10.pdf>

and the southeastern Bering Sea. Most fisheries south and east of Cape Suckling in the Yakutat and Southeast Alaska regions are not included, and most fisheries north and west of Bristol Bay are also excluded. Also not included or not dealt with in detail are fisheries with only small landings and those fisheries for which landings data are confidential (having three or fewer participants<sup>2</sup>). In contrast to the 2000 report, this update includes information on the “parallel” groundfish fisheries prosecuted in state waters during federal groundfish openings.

As was done for the 2000 report, the statewide fish ticket database was queried to produce the data and graphs for this update. This database provides information on landed catch and not catch that is discarded prior to landing. Therefore, although the term catch is used in this report, this really means the landed catch. Recent status of fisheries is given for the 2005 season. For shellfish fisheries the recent status is generally for the summer 2005 to spring 2006 season.

The reported information is organized with chapters for each of the four major fishery groups: herring, salmon, invertebrates, and groundfish and there is a summary table for each group prepared in a manner similar to those in the 2000 report for ease of comparison. These tables answer the “what” questions 1 and 4 to 10. Question 2, pertaining to “when”, is answered graphically for the past fishing season for each major fishery, and question 3, pertaining to “where,” is answered for those same fisheries with maps of the distribution of catches. The accompanying text identifies noteworthy changes in fisheries that have occurred in the past 6 years, including those changes that may have implications for interactions with populations of SSL. The chapters, tables, and figures on each of the main fishery groups contain cross references to the numbers used in the 2000 report, referred to here as “historical.” This was done to facilitate comparisons of information between the two reports. There are various figures in the 2000 report historical sequence (e.g., Figure 4.4) for which the information is static and an update was not needed; hence, those figures were not included in this update.

With regard to designations of SSL critical habitat, the particular restrictions on individual fisheries varies considerably within the broader designation of critical habitat<sup>3</sup>. Commercial fishing is allowed in state waters within critical habitat, but only where there are no specific prohibitions on fishing for the stock in question or other prohibitions that would preclude fishing (e.g., no transit zones). Also, the maps provided here show fishing locations by statistical areas, the boundaries for which generally do not coincide with the boundaries of critical habitats. This mismatch may result in the appearance of fishing occurring in designated critical habitat when in fact the catch locations may have been in a portion of the statistical area outside of the critical habitat.

The graphics and tables for this report were prepared primarily by Lee Hulbert and the text was written by Doug Woodby, borrowing from the 2000 report where appropriate.

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<sup>2</sup> The 2000 report used a slightly different confidentiality criterion of fewer than 3 participants.

<sup>3</sup> See <http://www.fakr.noaa.gov/sustainablefisheries/2003hrvstspecssl.htm> for details on area restrictions.

## STELLER SEA LION BIOLOGY

The 2000 report included a condensed version of a summary of SSL biology from chapter 3 of *Endangered Species Act Section 7 Consultation – Biological Opinion* by NMFS (1999). Additional and extensive research since that time has been published by a wide spectrum of individuals and institutions. A compendium of this research was prepared under contract for the National Pacific Fisheries North Pacific Fishery Management Council (NPFMC) by Loughlin and Tagart (2006), available on the NPFMC web site<sup>4</sup>. A draft revision of the SSL recovery plan (NMFS 2006<sup>5</sup>) provides a comprehensive review of SSL status and ecology relevant to assessing threats and to devising a recovery program. A description of the historical development of SSL research programs through 2002 was prepared by Ferrero and Fritz (2002<sup>6</sup>). The reader is directed to these sources for the latest research results and information on SSL biology.

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<sup>4</sup> [http://www.fakr.noaa.gov/npfmc/current\\_issues/ssl/Compendium606.pdf](http://www.fakr.noaa.gov/npfmc/current_issues/ssl/Compendium606.pdf)

<sup>5</sup> <http://www.fakr.noaa.gov/protectedresources/stellers/recovery/sslrpdraft0506.pdf>

<sup>6</sup> <http://www.afsc.noaa.gov/Stellers/NOAA-TM-AFSC-129.pdf>

# 1. HERRING FISHERIES (HISTORICAL CHAPTER 4)

## 1.1. OVERVIEW AND TRENDS

The status of Pacific herring fisheries in Alaska has been fairly stable with catches averaging around 22 thousand metric tons (mt) in the past 5 years in state waters west of 144° W longitude (Figure 1.1). Harvests continue to be dominated by landings from purse seines (73%) and gillnets (27%) with no additional trawl effort since 1997 (Figure 1.2).

## 1.2. FISHERY STATUS IN 2005

Prince William Sound (PWS) has remained closed to herring fisheries since 1999 due to low abundance (Figure 1.3). Continued high rates of infection with viral hemorrhagic septicemia (VHS) and interactions of the virus with the fungus like organism *Icthyophonus hoferi* are considered to be contributing factors. There has been increased interest by local communities in restoring herring populations in PWS and in 2006 the Exxon Valdez Oil Spill Trustee Council has initiated planning of a long-term herring restoration program.

Herring populations in Cook Inlet remain low. Small harvests of herring for sac roe using gillnets took place from 2001 to 2005 in upper Cook Inlet, averaging about 11 mt (Figures 1.4 and 1.5). Harvests in 2005 peaked in mid to late July (amounts are confidential). Populations in Lower Cook Inlet (Kamishak Bay) have yet to recover from recent low levels and that fishery has remained closed since 1998.

Herring populations and harvests in Kodiak area waters have increased somewhat from levels in 2000 (Figure 1.6). Small catches for the food and bait market were taken in the fall and winter on the west side of the island in 2005 (Figure 1.7) Sac roe catch locations were more widely distributed in 2005 as compared to 1999 and are largely within SSL critical habitat zones (Figure 1.8). Sac roe herring harvests peaked in the second half of April, 2005. Sac roe catches from all gear types averaged about 2,165 mt from 2001–2005.

The bait fishery near Dutch Harbor has continued at slightly reduced levels in the past 6 years (Figure 1.9). Landings in the 2005 fishery were made in mid-July and are confidential (Figure 1.10). There was only one commercial opening for sac roe harvest on the Alaska Peninsula shoreline in the past 6 years, and this was at Port Moller in May, 2005 and was not in SSL critical habitat (Figure 1.11). The Togiak sac roe fishery has stabilized at an average of approximately 18,000 mt in the past 6 years (Figure 1.12), with harvests by both purse seine (71%) and gillnets (29%). Landings in 2005 came primarily from 3 spawning areas in late April and early May, including areas within SSL critical habitat (Figure 1.13; Historical Title 4.20).

## 1.3 OVERLAP OF HERRING FISHERIES AND STELLER SEA LION CRITICAL HABITAT

The locations of herring fisheries in 2005 was similar if not identical to the locations in 1999, and the summary of potential interaction presented in the 2000 report are still valid. Much of the herring harvest activity in 2005 in Kodiak and the Alaska Peninsula areas were within areas defined as SSL critical habitat (Figures 1.7, 1.8 and 1.10), except for the sac roe fishery on the north side of the Alaska Peninsula. Harvests in Cook Inlet were also outside of critical habitat (Figure 1.5), and only a small portion of the Bristol Bay fishery overlapped critical habitat (Figure 1.13).

#### **1.4 DIRECT FISHERY INTERACTIONS**

There is no new information on direct interactions between herring fisheries and SSL. There are no observers on board herring fishing vessels and therefore, as reported in 2000, there is no information formally recorded on direct interactions with SSL in these fisheries.



**Table 1.1 (Historical Table 4.1).**—Status of 2005 herring fisheries in Alaska west of 144° W. Long.

Fishery Area	Season	Gear <sup>a</sup>	Assessment Method <sup>b</sup>	Biomass <sup>c</sup> (mt)	Stock Status		Harvest Policy		Threshold (mt)	2005 Fishery		
					Level	Trend	Exploitation Rate Framework <sup>d</sup>	2005		Duration	Catch (mt)	
Prince William Sound		PS,Gn,Pd,Hp	ASA	19,109	Low	Stable	0–20%	0%	19,958	-	0	
Cook Inlet (Upper)	Sac Roe	Gn	None	No est.	Low	Stable	N/A	N/A	N/A	6 weeks	*	
Cook Inlet (Kamishak)	Sac Roe	PS	ASA	2,128	Low	Stable	0–15%	0%	5,443	-	0	
Kodiak	Sac Roe	PS,Gn,Tr	Catch, age comp.	Uncertain	Moderate	Increasing	0–20%			30 days	3,376	
Alaska Peninsula - Aleutian Islands Area	Food/Bait	PS, GN	<i>(Harvest policy specified as 7% allocation of 2005 Bristol Bay allowable catch, 1174 short tons)</i>								57 days	*
Alaska Peninsula	Sac Roe	PS	Annual Survey	4,600	no data	no data	0–20%	*	1,000	2 days	*	
Bristol Bay (Togiak)	Sac Roe	PS,Gn	ASA	117,912	Moderate	Stable	20% max.	20%	31,752	149 hrs Gn	17,915	
Kuskokwim Area	Sac Roe	Gn	Annual Survey	22,937	Moderate	Declining	15–20% max. 0–20% by area			Varies by area	2,626	
Cape Romanzof	Sac Roe	Gn	Annual Survey	3,073	Moderate	Declining	20% max.	*	1,361	158 hrs.	*	
Norton Sound	Sac Roe	Gn	Annual Survey	37,428	High	Stable	20% max.	*	6,350	7 days	*	

<sup>a</sup> Gears: Gillnet (Gn), purse seine (PS), pound spawn-on-kelp (Pd), hand-picked spawn-on-kelp (Hp), beach seine (BS), trawl (Tr).

<sup>b</sup> Assessment methods: Age-structured assessment models (ASA), synthesize several sources of abundance information.

<sup>c</sup> Run biomass is defined as the proportion of the population which will return to spawn.

<sup>d</sup> Framework” is 20% minus 181 mt for subsistence.

\*Confidential catch.

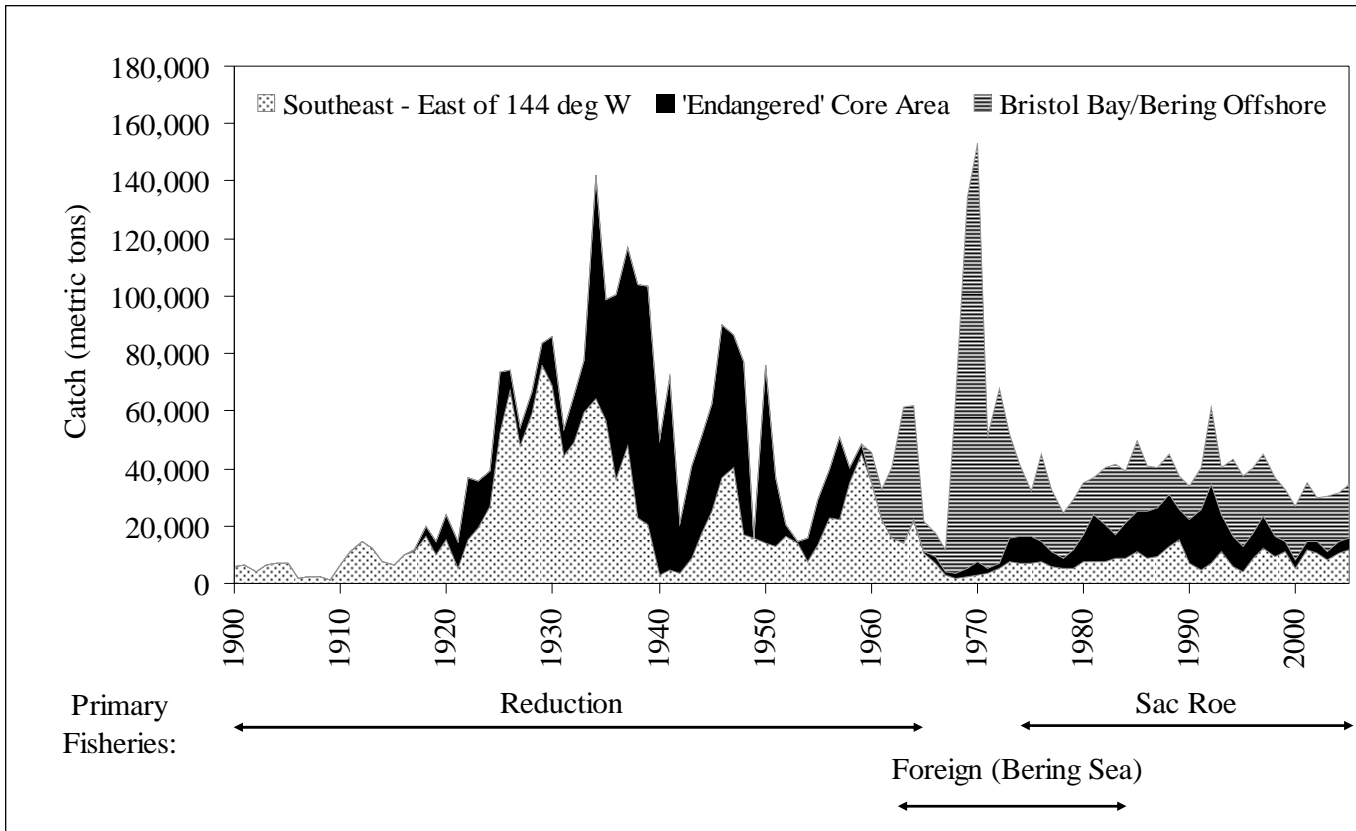
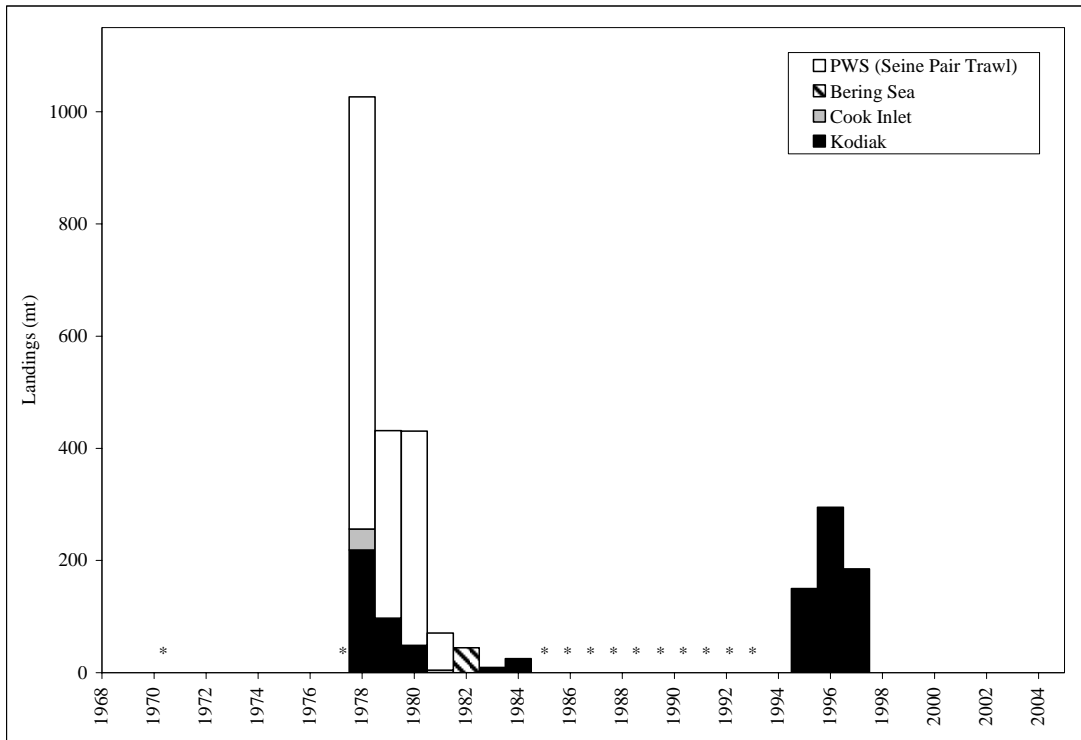
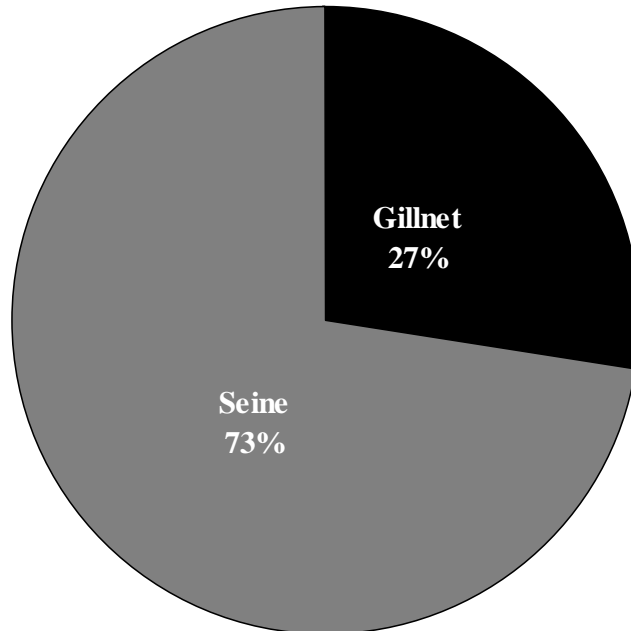


Figure 1.1 (Historical Figure 4.2).—Historical Pacific herring landings in Alaska.

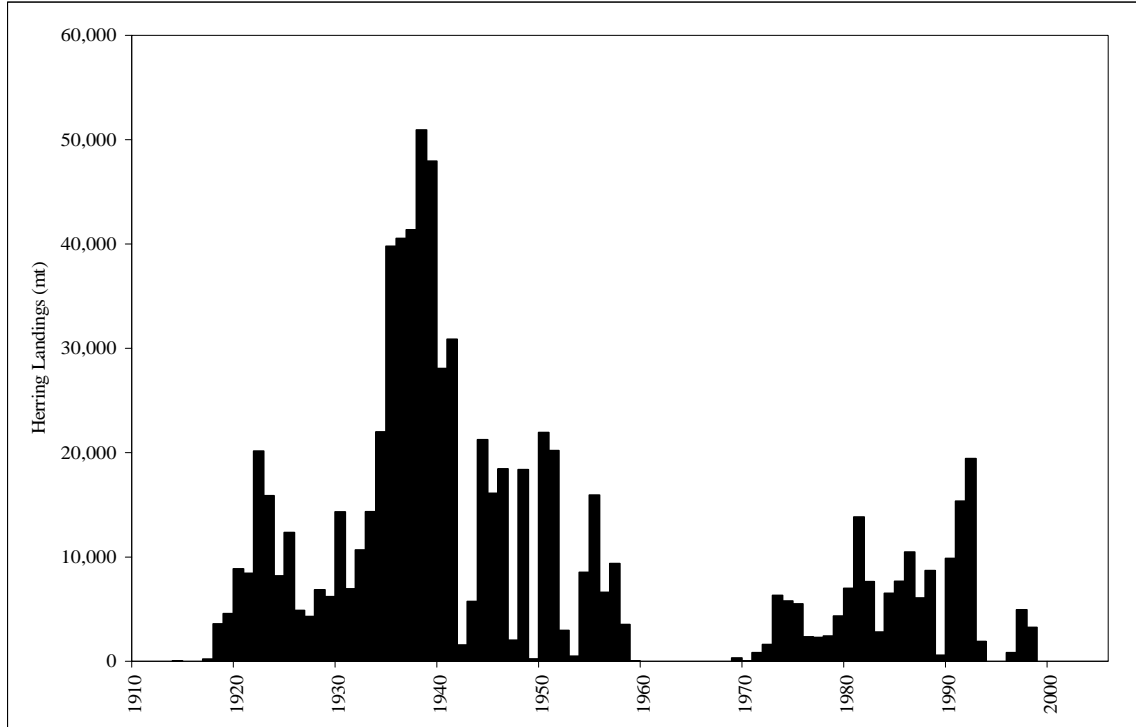
A) Trawl food/bait herring landings, 1968–2005.



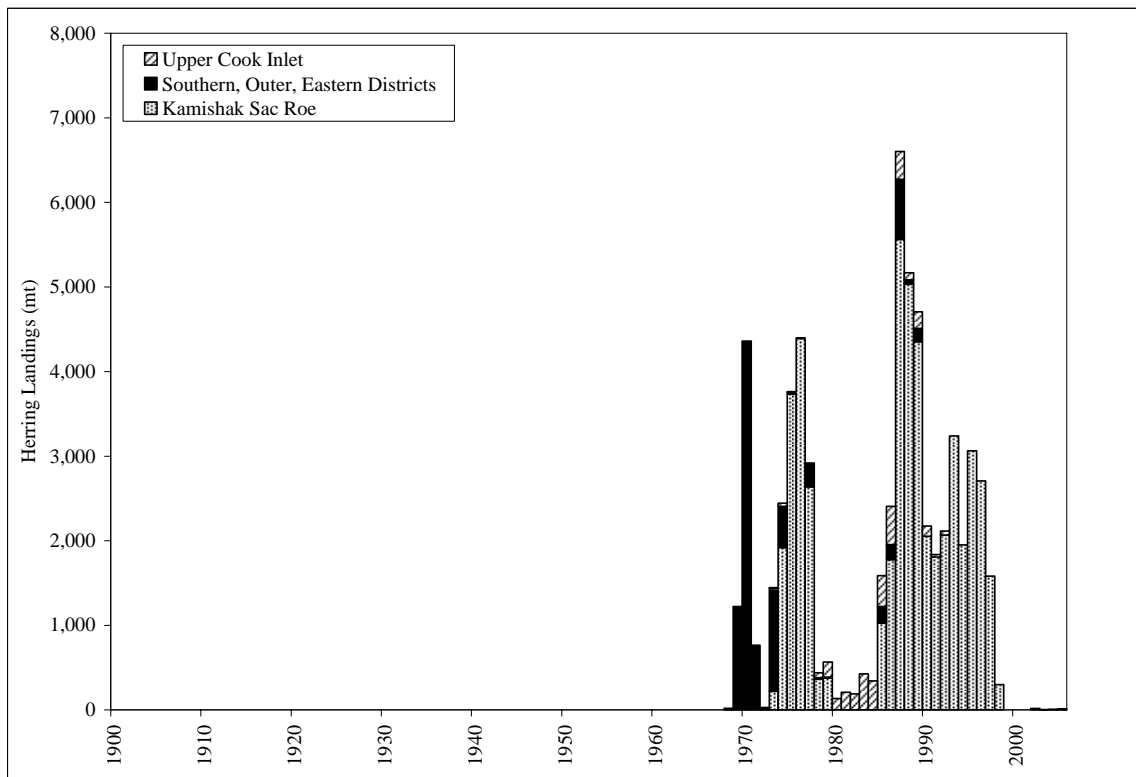
B) Average herring landings by gear, 2000–2005.



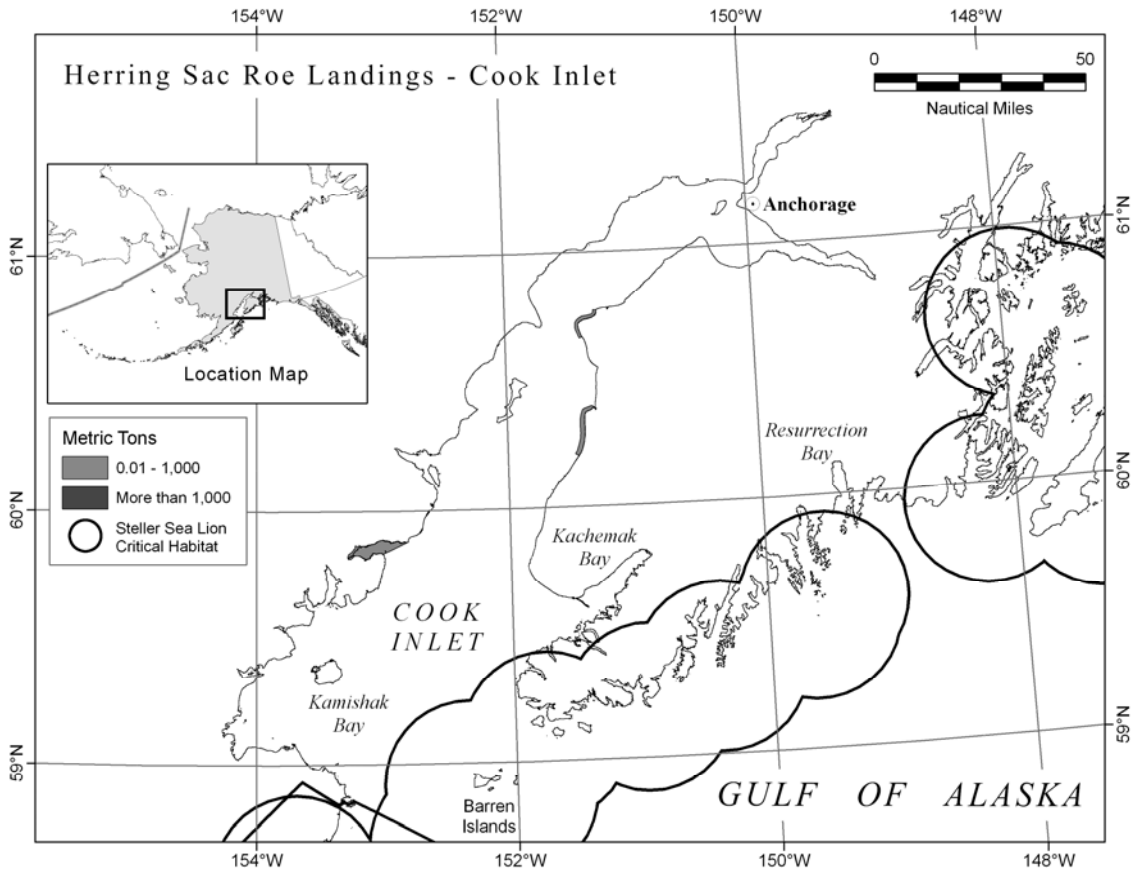
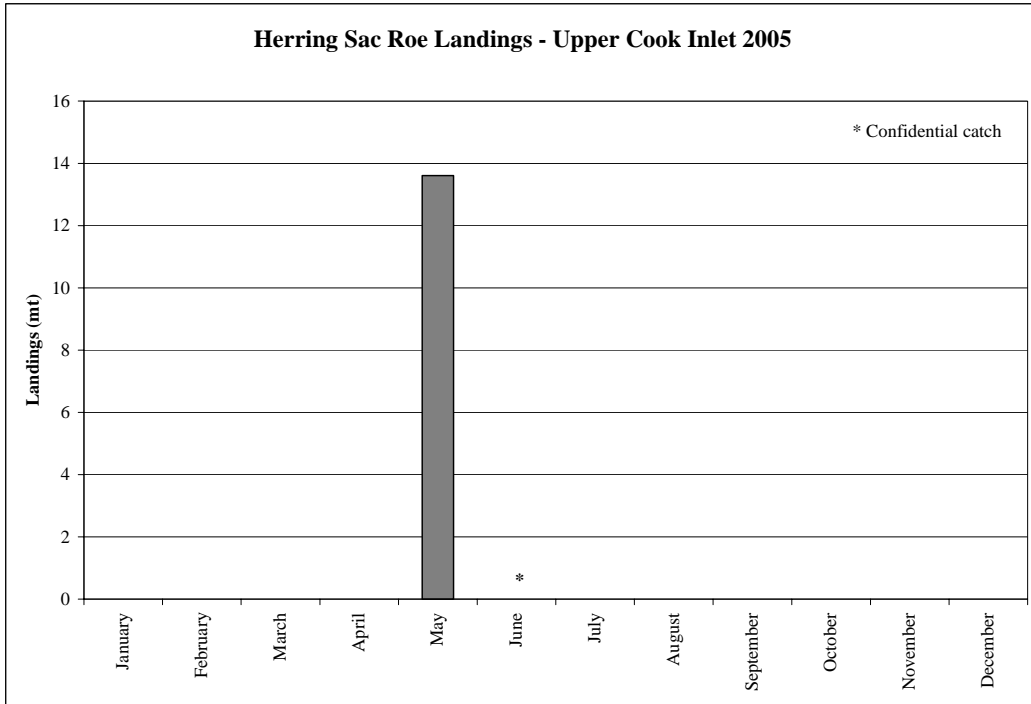
**Figure 1.2 (Historical Figure 4.3).**—Pacific herring trawl landings in Alaska by area (A) Trawl food/bait herring landings, 1968-2005) and (B) 2000–2005 average percent harvested by gear. Harvests from the 1960–1980 foreign trawl fishery are not included. Asterisks in Figure 1.2A indicate confidential data.



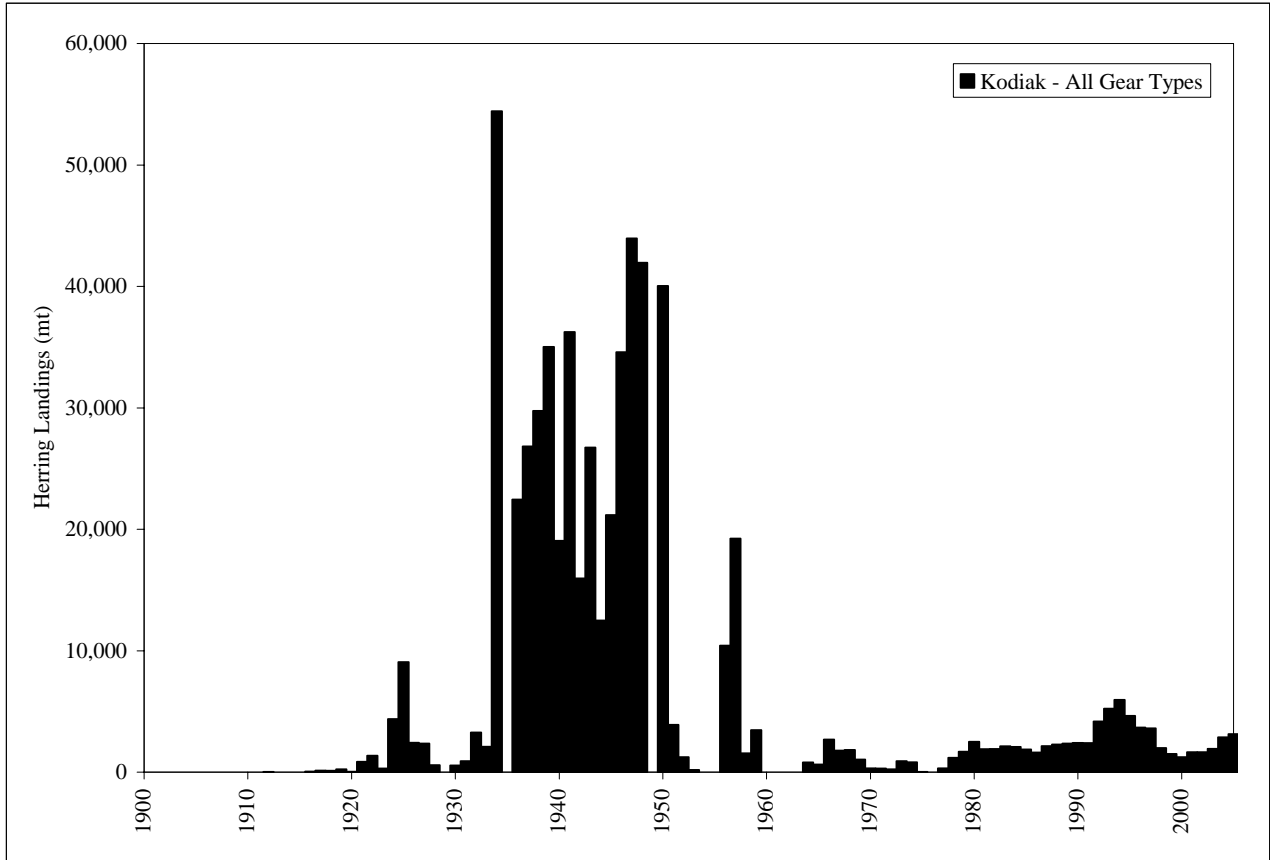
**Figure 1.3 (Historical Figure 4.5).**—Historical herring landings in Prince William Sound (mt), 1910–2005. There have been no additional herring harvests since 1999.



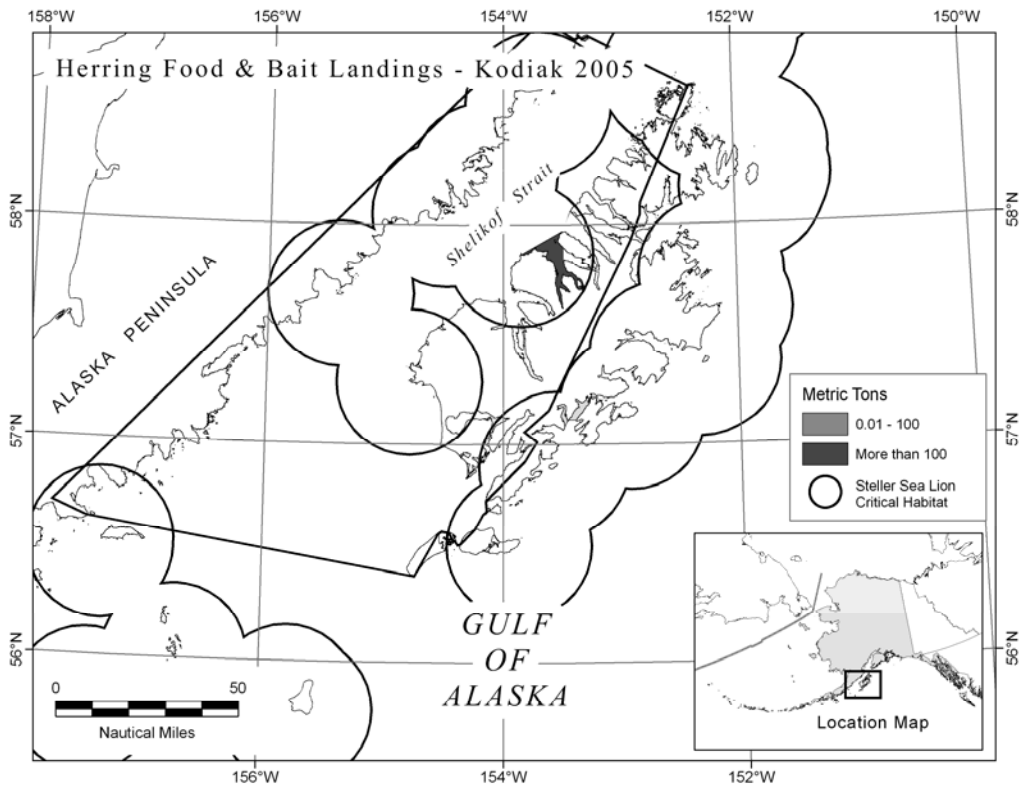
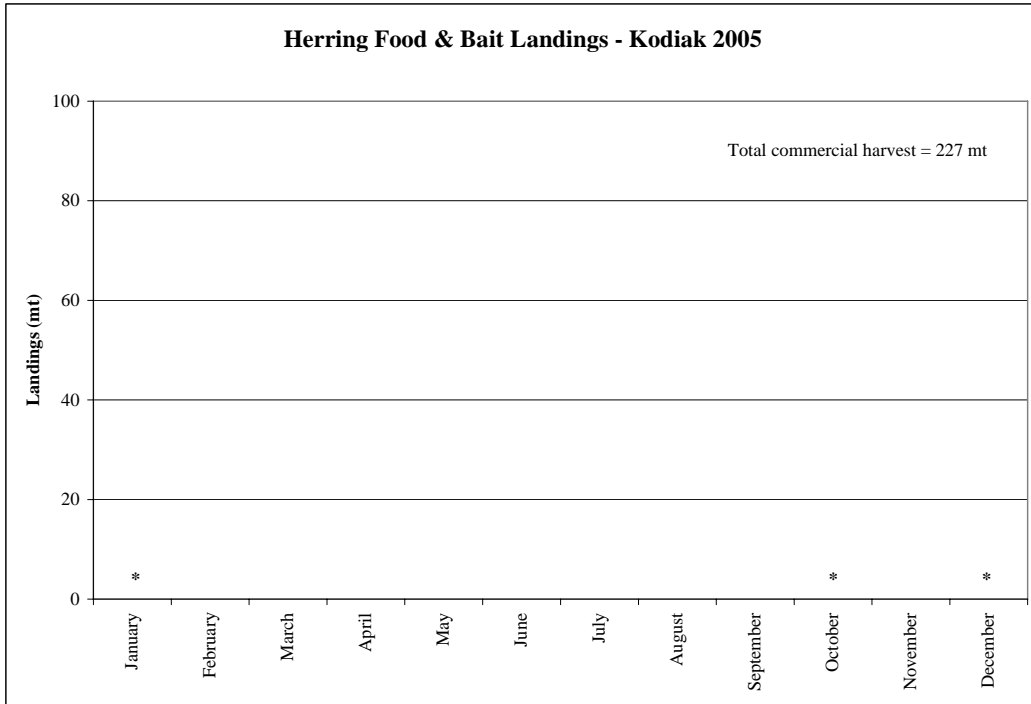
**Figure 1.4 (Historical Figure 4.10).**—Cook Inlet herring landings (mt), 1900–2005.



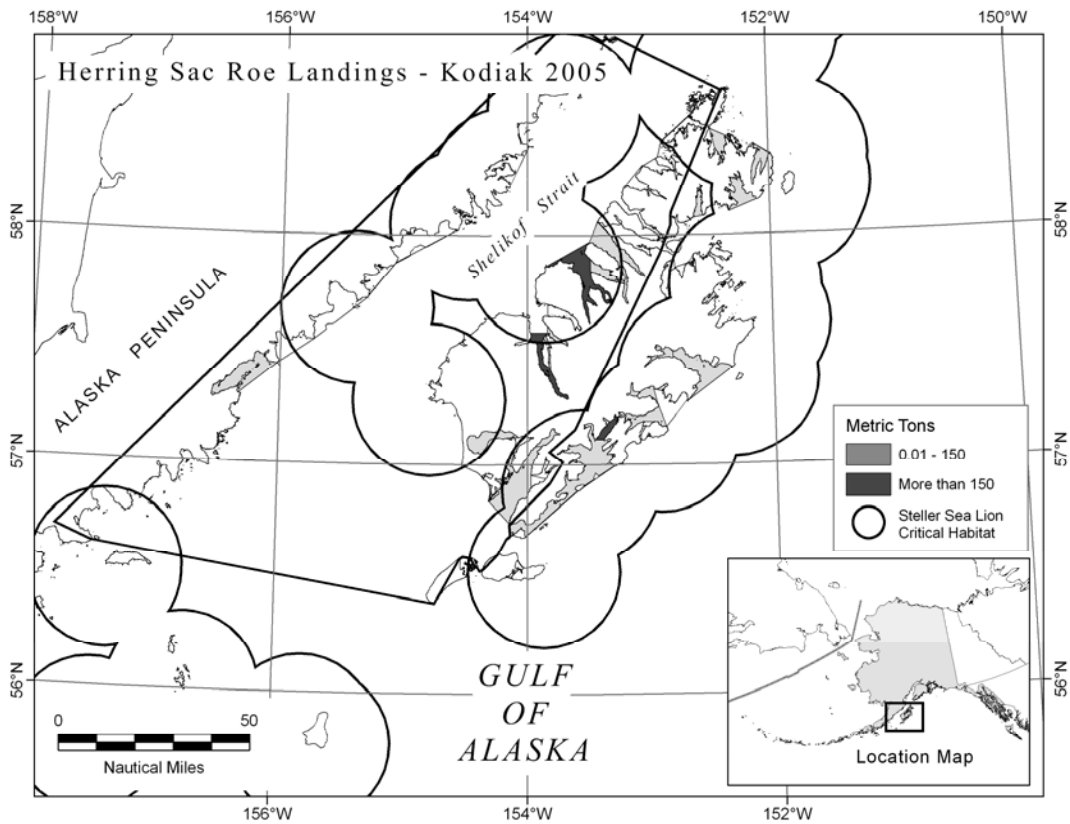
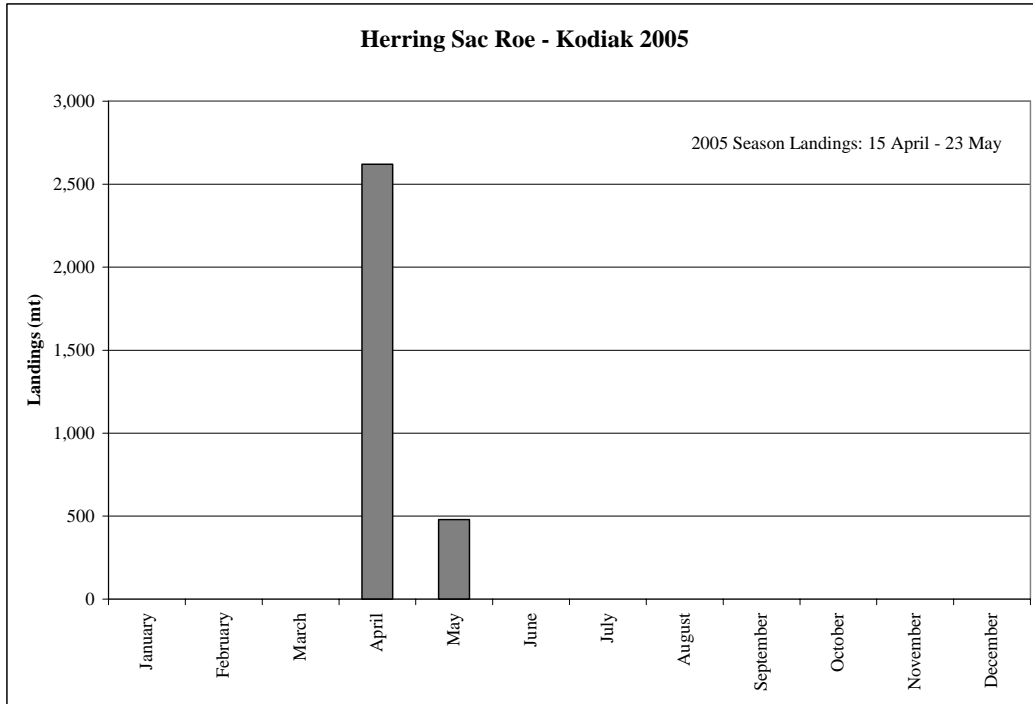
**Figure 1.5 (Historical Figure 4.11)**—Monthly distribution of herring sac roe landings in Cook Inlet, 2005 (top), and spatial distribution of herring sac roe landings in Cook Inlet, 2005 (bottom). \* indicates confidential landings.



**Figure 1.6 (Historical Figure 4.12).**—Historical herring landings (mt) in the Kodiak area, 1900–2005.

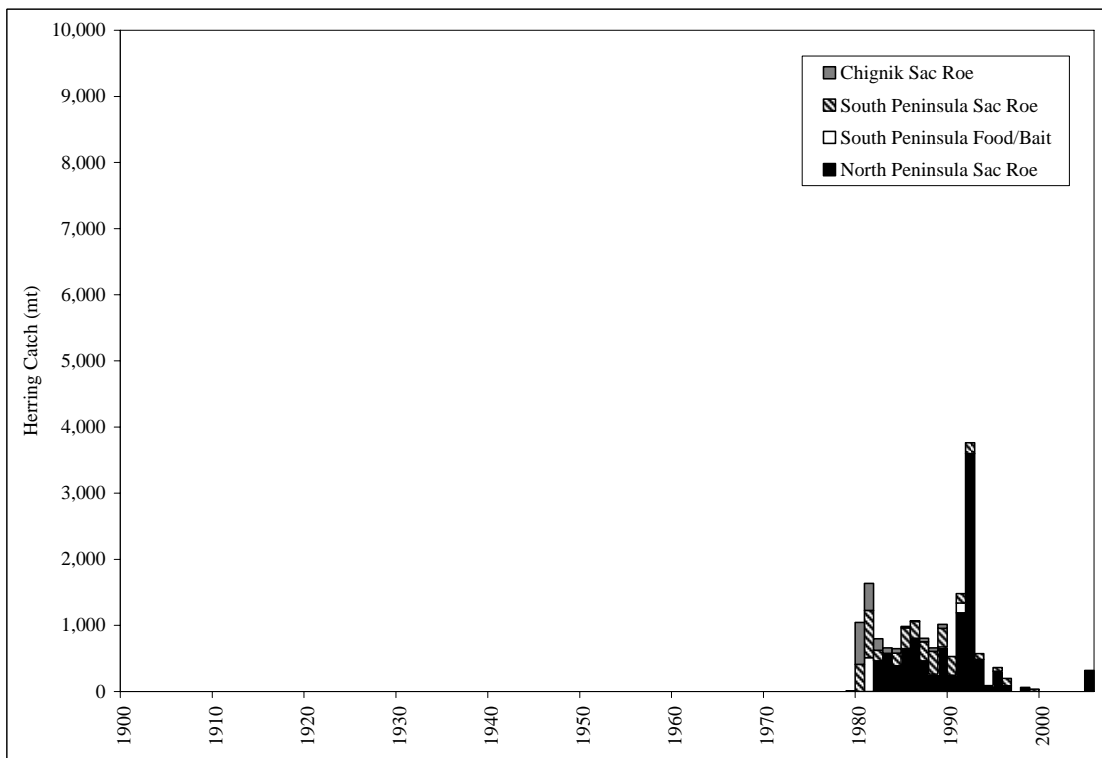
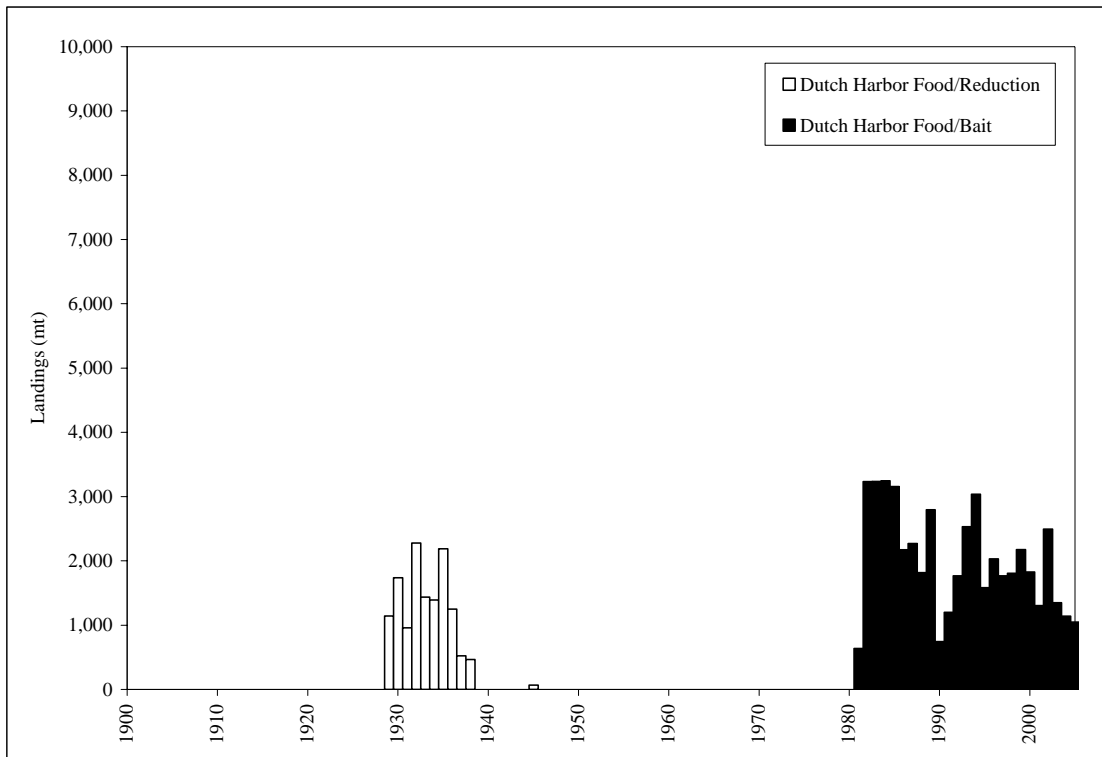


**Figure 1.7 (Historical Figure 4.13).**—Monthly distribution of herring food and bait landings in the Kodiak management area, 2005 (top), and spatial distribution of herring food and bait landings in the Kodiak management area, 2005 (bottom). \* indicates confidential landings.

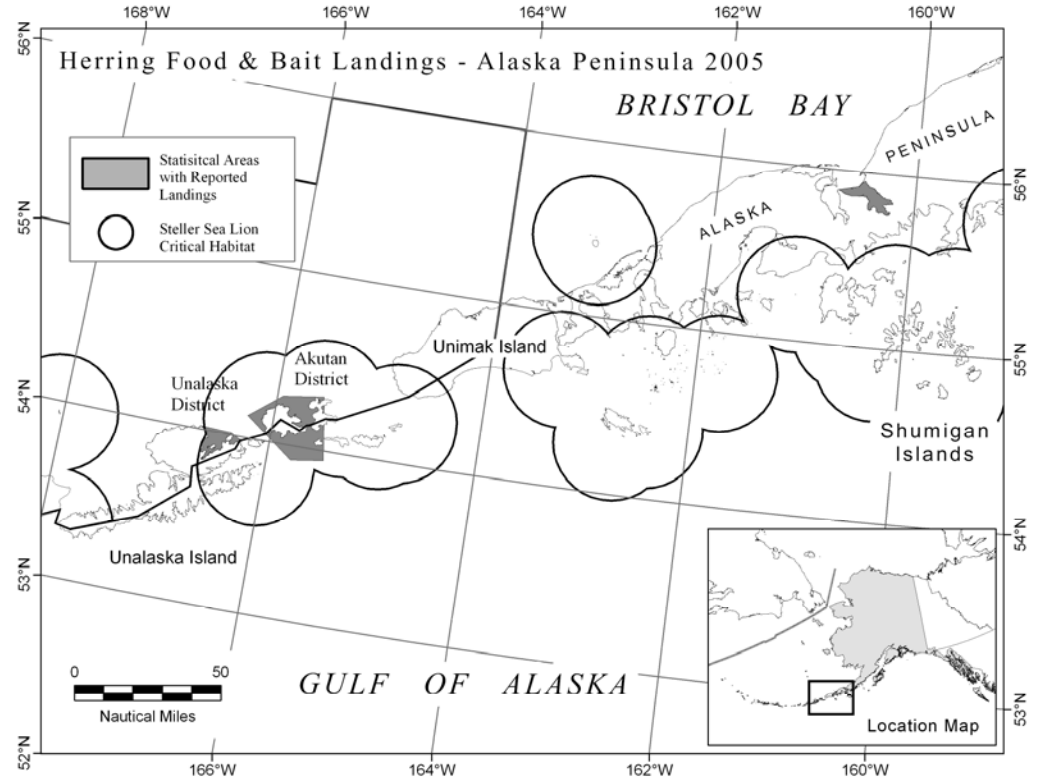
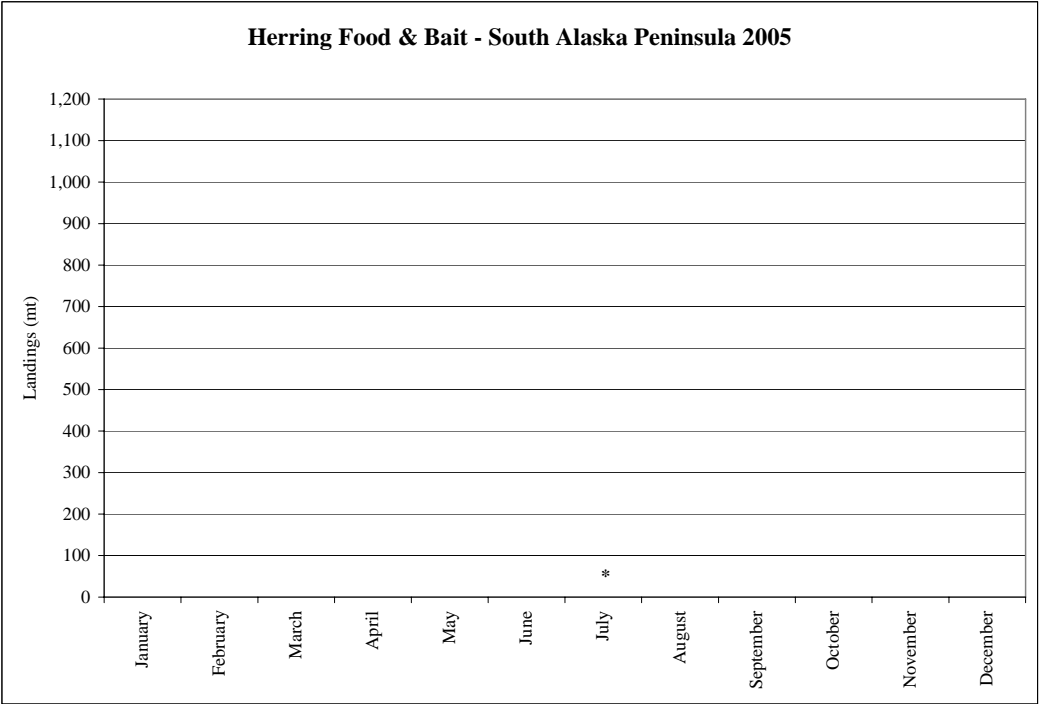


**Figure 1.8 (Historical Figure 4.14).**—Monthly distribution of herring sac roe landings in the Kodiak management area, 2005 (top), and spatial distribution of herring sac roe landings in the Kodiak management area, 2005 (bottom).

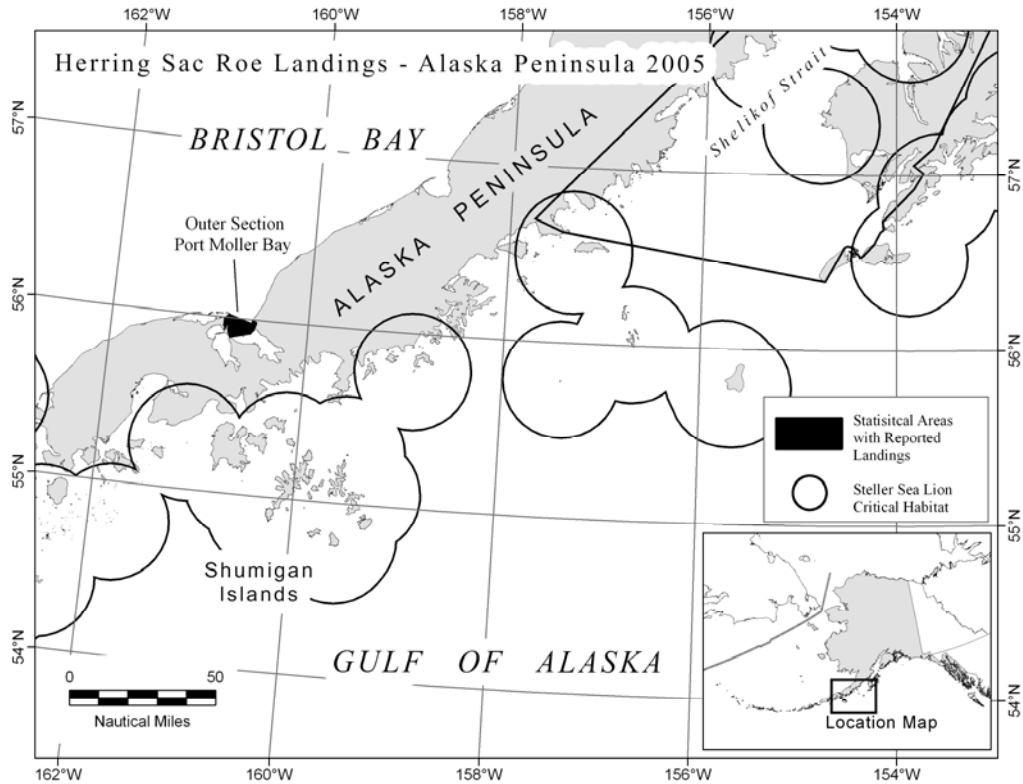
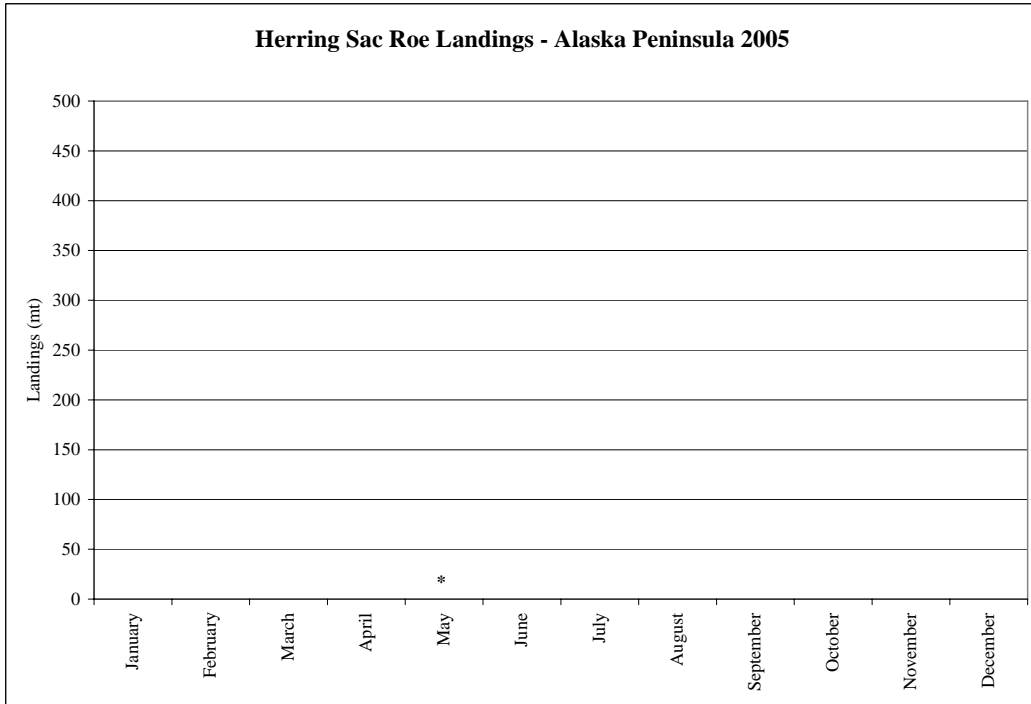




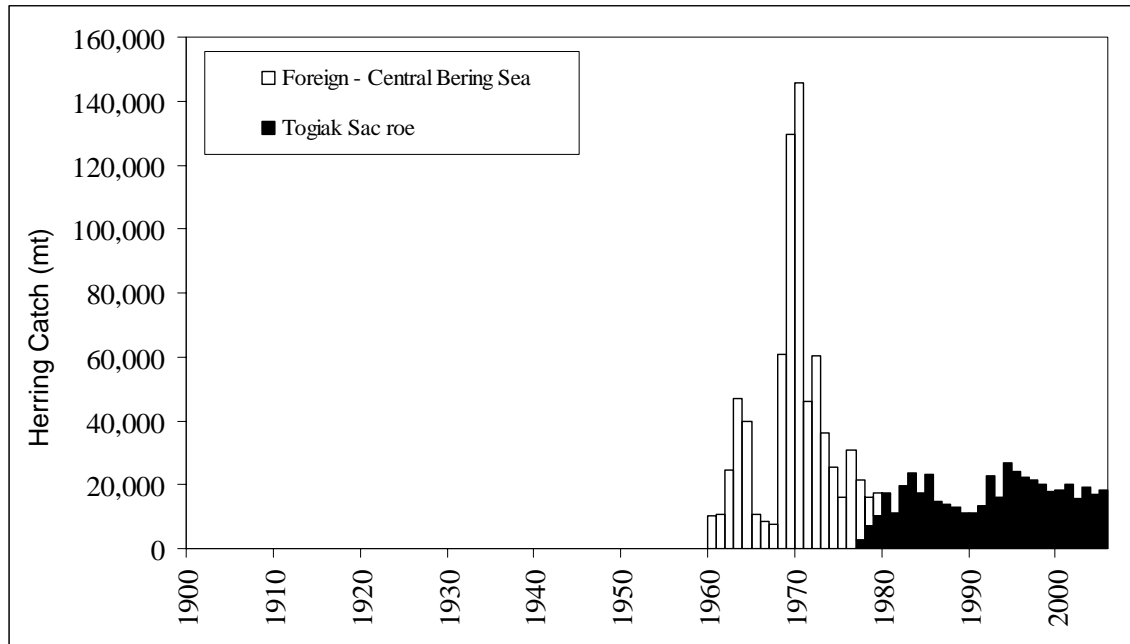
**Figure 1.9 (Historical Figure 4.15).**—Herring landings from the Dutch Harbor area fisheries (top) take mostly Bristol Bay spawning herring. South and North Peninsula herring landings (bottom) harvest local stocks.



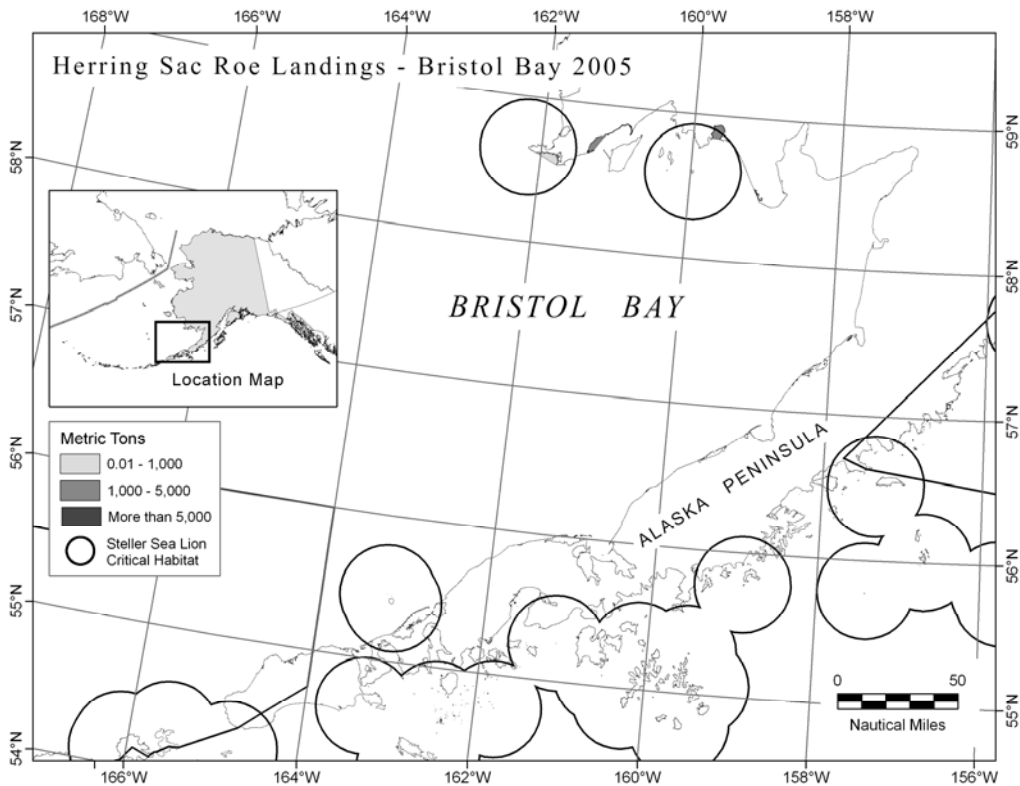
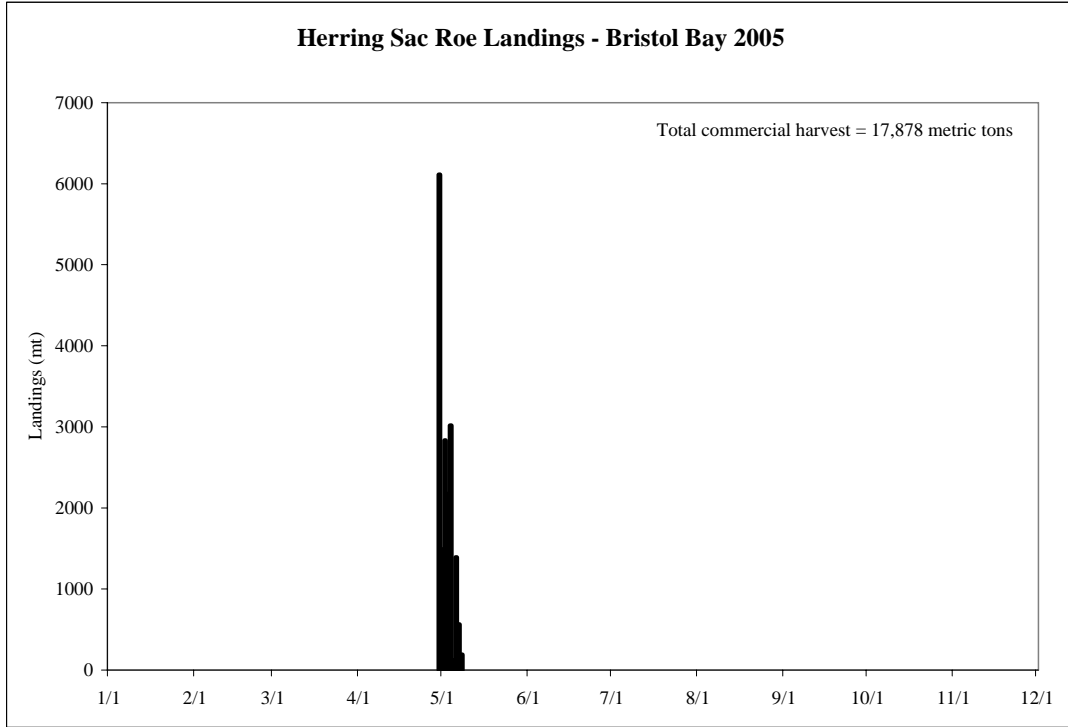
**Figure 1.10 (Historical Figure 4.16).**—Monthly distribution of herring food and bait landings in the Alaska Peninsula management area, 2005 (top), and spatial distribution of herring food and bait landings in the Alaska Peninsula management area, 2005 (bottom). \* indicates confidential landings.



**Figure 1.11 (Historical Figure 4.17).**—Monthly distribution of herring sac roe landings in the Alaska Peninsula management area, 2005 (top), and spatial distribution of herring sac roe landings in the Alaska Peninsula management area, 2005 (bottom). \* indicates confidential landings.



**Figure 1.12 (Historical Figure 4.19).**—Herring landings in the Togiak sac roe fishery and the offshore foreign fishery, which harvested primarily Togiak-spawning herring.



**Figure 1.13 (Historical Figure 4.20).**—Monthly distribution of herring sac roe landings in the Bristol Bay management area, 2005 (top), and spatial distribution of herring sac roe landings in the Bristol Bay management area, 2005 (bottom).

## **2. SALMON FISHERIES (HISTORICAL CHAPTER 5)**

### **2.1. OVERVIEW AND TRENDS**

Alaska's salmon landings reached an all time annual high of 221.9 million fish in 2005 (Figure 2.1), primarily due to historic high catches of pink salmon (Figure 2.2). Overall, the state's wild salmon populations are healthy (Table 2.1) and markets are improving for sale of Alaska's wild salmon catches, despite competition with worldwide production of farmed salmon. Landings in the past 6 years have increased for pink, sockeye, coho, and Chinook salmon but have declined for chum salmon (Figures 2.2 to 2.6; statewide data including Southeast Alaska landings are included in Figures 2.1 to 2.6 for ease of comparison with similar figures in the 2000 report). More detailed information on Alaska's commercial salmon fisheries is available in Clark et al. (2006).

### **2.2. FISHERY STATUS IN 2005**

The update of salmon fishery landings by area is as follows. Landings within PWS saw a general increase, with greatest catches in the purse seine fishery and in statistical areas of the Copper River mouth and the southwestern Sound (Figure 2.7). Net fisheries in Cook Inlet increased in biomass of landings and were more widespread in 2005 as compared to the very restricted status in 1999, including landings from Aialik Bay in critical habitat (Figure 2.8). Kodiak purse seine landings in 2005 were up twofold in July and August as compared to 1999, with somewhat higher tonnage of landed catch in several locations around the island in critical habitat (Figure 2.9). Chignik area landings (purse seine) were considerably lower in 2005, and were taken primarily in June and July, and barely into August as occurred in 1999 (Figure 2.10). In the South Alaska Peninsula fisheries, drift gillnet landings were mostly confined to June, whereas 1999 landings were made throughout the summer through to September (Figure 2.11). Purse seine catches also peaked earlier in 2005, with highest catches in July as compared to August in 1999. Drift gillnets captured the vast majority of the commercial salmon harvest in the North Alaska Peninsula district, with higher catches in 2005 as compared to 1999 (Figure 2.12). This included catches in critical habitat of the Peninsula in the vicinity of Amak Island. Catches in 2005 in nearshore Bristol Bay, primarily of sockeye salmon, were similar to 1999 catches, and outside of SSL critical habitat (Figure 2.13).

### **2.3 OVERLAP OF SALMON FISHERIES AND STELLER SEA LION CRITICAL HABITAT**

There have been no major changes in the locations and timing of Alaska's salmon fisheries in the past 6 years in or near areas of critical habitat for SSL. As described in the 2000 report, salmon fisheries in the central and western Gulf of Alaska and in the Bering Sea are prosecuted with gillnets and purse seines, and largely occur within 3 miles of shore, often within critical habitat for SSL.

### **2.4 DIRECT FISHERY INTERACTIONS**

Direct interactions, including mortality of SSL and damage by SSL to salmon gillnets and purse seine nets are not routinely monitored but may have occurred at frequencies and in locations in 2005 similar to those reported in 2000. A short-term observer program in 2002 was conducted in the Kodiak salmon drift gillnet fishery, for which no SS injuries or mortalities were observed despite frequent observations of SSL in the vicinity of the gear (Manly et al. In review).

**Table 2.1 (Historical Table 5.1).**—Summary of stock status, assessment method, and gear type for state-managed salmon fisheries in 2005.

Managed Stock	Gear	Escapement Assessment	Stock Status
Upper Copper River Chinook	Drift Gillnet	Aerial Survey	Healthy
Upper Copper River Sockeye	Drift Gillnet	Sonar	Healthy
Bering River Sockeye	Drift Gillnet	Aerial Survey	Healthy
Copper River Delta Sockeye	Drift Gillnet	Aerial Survey	Healthy
Copper River Delta Coho	Drift Gillnet	Aerial Survey	Healthy
Prince William Sound Pink Salmon			
Eastern District	Purse Seine	Aerial Survey	Healthy
Southeastern District	Purse Seine	Aerial Survey	Healthy
Montague District	Purse Seine	Aerial Survey	Healthy
Southwestern District	Purse Seine	Aerial Survey	Healthy
Eshamy District	Set Gillnet/Drift Gillnet	Aerial Survey	Healthy
Northwestern District	Purse Seine	Aerial Survey	Healthy
Coghill District	Purse Seine/Drift Gillnet	Aerial Survey	Healthy
Northern District	Purse Seine	Aerial Survey	Healthy
Unakwik District	Purse Seine/Drift Gillnet	Aerial Survey	Healthy
Prince William Sound Chum Salmon			
Eastern District	Purse Seine	Aerial Survey	Healthy
Southeastern District	Purse Seine	Aerial Survey	Healthy
Montague District	Purse Seine	Aerial Survey	Healthy
Southwestern District	Purse Seine	Aerial Survey	Healthy
Eshamy District	Set Gillnet/Drift Gillnet	Aerial Survey	Healthy
Northwestern District	Purse Seine	Aerial Survey	Healthy
Coghill District	Purse Seine/Drift Gillnet	Aerial Survey	Healthy
Northern District	Purse Seine	Aerial Survey	Healthy
Unakwik District	Purse Seine/Drift Gillnet	Aerial Survey	Healthy
Prince William Sound Sockeye Salmon			
Eshamy	Set Gillnet/Drift Gillnet	Weir	Healthy
Coghill	Purse Seine/Drift Gillnet	Weir	Healthy
Lower Cook Inlet Sockeye			
Chenik Lake	Purse Seine	Aerial Survey	Healthy
Desire Lake	Purse Seine	Aerial Survey	Healthy
Delight Lake	Purse Seine	Aerial Survey/Weir	Healthy
English Bay	Set Gillnet	Aerial Survey/Weir	Healthy <sup>1</sup>
Mikfik Creek	Purse Seine	Aerial Survey/Video	Healthy
Lower Cook Inlet Pink Salmon			
Eastern District	Purse Seine	Aerial/Ground Surveys	Healthy
Outer District	Purse Seine	Aerial/Ground Surveys	Healthy
Kamishak District	Purse Seine	Aerial Survey	Healthy
Southern District	Purse Seine/Set Gillnet	Aerial/Ground Surveys	Healthy
Lower Cook Inlet chum Salmon			
Eastern District	Purse Seine	Ground Surveys	Healthy
Outer District	Purse Seine	Aerial/Ground Surveys	Healthy
Kamishak District	Purse Seine	Aerial Survey	Healthy
Southern District	Purse Seine/Set Gillnet	Aerial/Ground Surveys	Healthy

<sup>1</sup>English Bay Lakes are presently enhanced using its own wild stock as brood source.

-continued-

**Table 2.1**–Page 2 of 4.

Managed Stock	Gear	Escapement Assessment	Stock Status
<b>Kodiak Area Pink Salmon</b>			
Afognak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Northwest Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Southwest Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Alitak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Northeast Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Eastside Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Mainland Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
<b>Kodiak Area Chum Salmon</b>			
Northwest Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Southwest Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Alitak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Northeast Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Eastside Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Mainland Kodiak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
<b>Kodiak Area Sockeye Salmon</b>			
Karluk	Purse Seine/Set Gillnet	Weir	Healthy
Ayakulik	Purse Seine/Set Gillnet	Weir	Healthy
Upper Station	Purse Seine/Set Gillnet	Weir	Healthy
Frazer	Purse Seine/Set Gillnet	Weir	Healthy
Litnik	Purse Seine/Set Gillnet	Weir	Healthy
Saltery	Purse Seine/Set Gillnet	Weir	Healthy
Pauls	Purse Seine/Set Gillnet	Weir	Healthy
Buskin	Purse Seine/Set Gillnet	Weir	Healthy
Akalura	Purse Seine/Set Gillnet	Weir	Healthy
Portage	Purse Seine/Set Gillnet	Weir	Healthy
Malina	Purse Seine/Set Gillnet	Weir	Healthy
Minor Systems	Purse Seine/Set Gillnet	Aerial Survey	Healthy
<b>Kodiak Area Coho Salmon</b>			
Karluk	Purse Seine/Set Gillnet	Weir	Healthy
Ayakulik	Purse Seine/Set Gillnet	Weir	Healthy
Upper Station	Purse Seine/Set Gillnet	Weir	Healthy
Dog Salmon	Purse Seine/Set Gillnet	Weir	Healthy
Horse Marine	Purse Seine/Set Gillnet	Weir	Healthy
Litnik	Purse Seine/Set Gillnet	Weir	Healthy
Saltery	Purse Seine/Set Gillnet	Weir	Healthy
Pauls	Purse Seine/Set Gillnet	Weir	Healthy
Buskin	Purse Seine/Set Gillnet	Weir	Healthy
Akalura	Purse Seine/Set Gillnet	Weir	Healthy
Big Bay	Purse Seine/Set Gillnet	Weir	Healthy
Bear Creek	Purse Seine/Set Gillnet	Weir	Healthy
Perenosa	Purse Seine/Set Gillnet	Aerial/Ground Surveys	Healthy
Northeast District Non-Weired	Purse Seine/Set Gillnet	Aerial Survey	Healthy
<b>Kodiak Area Chinook Salmon</b>			
Karluk	Purse Seine/Set Gillnet	Weir	Healthy
Ayakulik	Purse Seine/Set Gillnet	Weir	Healthy
Dog Salmon	Purse Seine/Set Gillnet	Weir	Healthy

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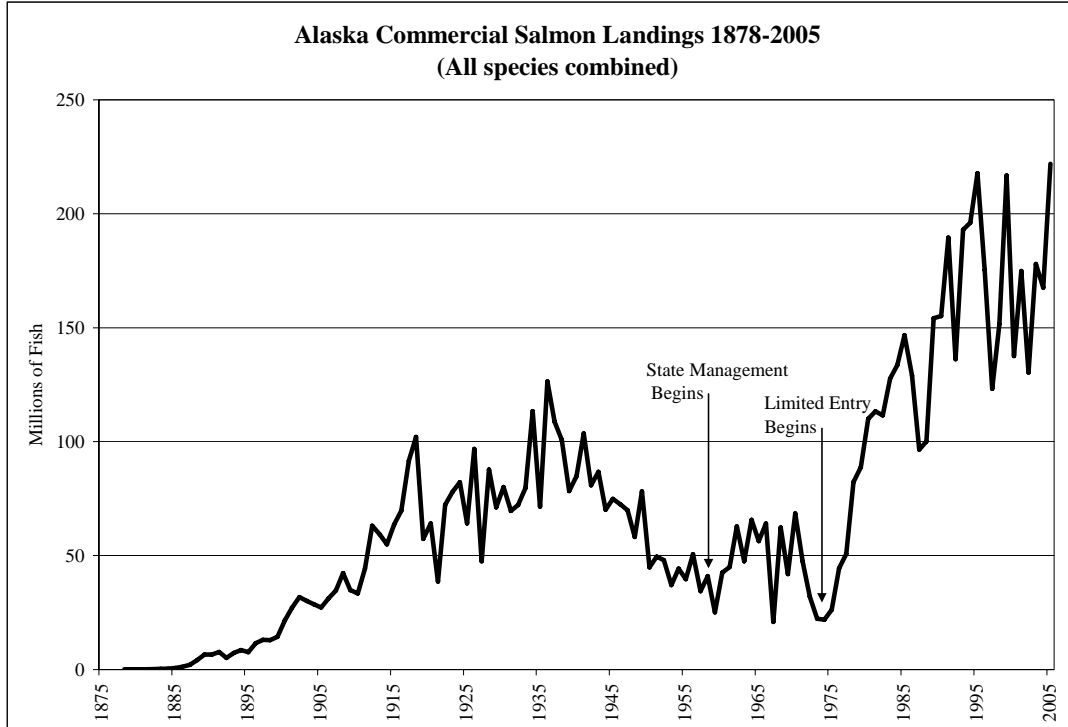
**Table 2.1**–Page 3 of 4.

Managed Stock	Gear	Escapement Assessment	Stock Status
Chignik Area Sockeye Salmon			
Black Lake	Purse Seine	Weir	Healthy
Chignik Lake	Purse Seine	Weir	Healthy
Chignik Area Pink Salmon			
Eastern District	Purse Seine	Aerial Survey	Healthy
Central District	Purse Seine	Aerial Survey	Healthy
Chignik Bay District	Purse Seine	Aerial Survey	Healthy
Western District	Purse Seine	Aerial Survey	Healthy
Perryville District	Purse Seine	Aerial Survey	Healthy
Chignik Area Chum Salmon			
Eastern District	Purse Seine	Aerial Survey	Healthy
Central District	Purse Seine	Aerial Survey	Healthy
Chignik Bay District	Purse Seine	Aerial Survey	Healthy
Western District	Purse Seine	Aerial Survey	Healthy
Perryville District	Purse Seine	Aerial Survey	Healthy
South Alaska Peninsula Pink Salmon			
Southeastern District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
SouthCentral District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Southwestern District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Unimak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
South Alaska Peninsula Chum Salmon			
Southeastern District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
SouthCentral District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Southwestern District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
Unimak District	Purse Seine/Set Gillnet	Aerial Survey	Healthy
South Alaska Peninsula Sockeye Salmon			
Orzinski River	Purse Seine/Set Gillnet		
North Alaska Peninsula Sockeye Salmon			
Bear River	Drift Gillnet/Purse Seine	Weir	Healthy
Nelson Lagoon	Drift Gillnet	Weir	Healthy
Ilnik Lagoon	Drift/Set Gillnet	Weir	Healthy
Sandy River	Drift Gillnet	Aerial Survey/Tower/Weir	Healthy
Urilia Bay Lagoon	Drift Gillnet	Aerial Survey	Healthy
Port Heiden	Drift Gillnet	Aerial Survey	Healthy
Swanson's Lagoon	Drift Gillnet	Aerial Survey	Healthy
Thin Point Lake	Drift Gillnet	Aerial Survey	Healthy
North Alaska Peninsula Pink Salmon			
Northwestern District	Drift Gillnet/Purse Seine	Aerial Survey	Healthy
North Alaska Peninsula Chum Salmon			
Northwestern District	Drift Gillnet/Purse Seine	Aerial Survey	Healthy
Northern District	Drift Gillnet/Purse Seine	Aerial Survey	Healthy
Aleutian Islands Pink Salmon			
Unalaska District	Purse Seine	Aerial Survey	Healthy
Bristol Bay Sockeye Salmon			
Ugashik River	Drift Gillnet/Set Gillnet	Tower	Healthy
Egegik River	Drift Gillnet/Set Gillnet	Tower	Healthy

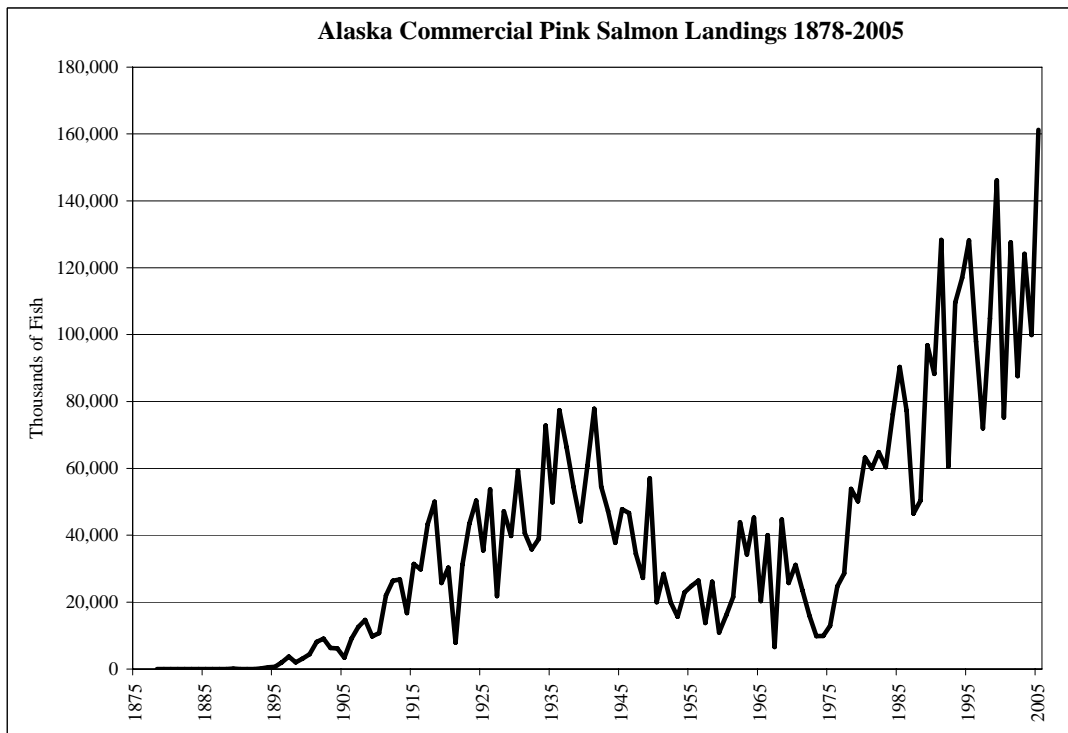
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**Table 2.1**–Page 4 of 4.

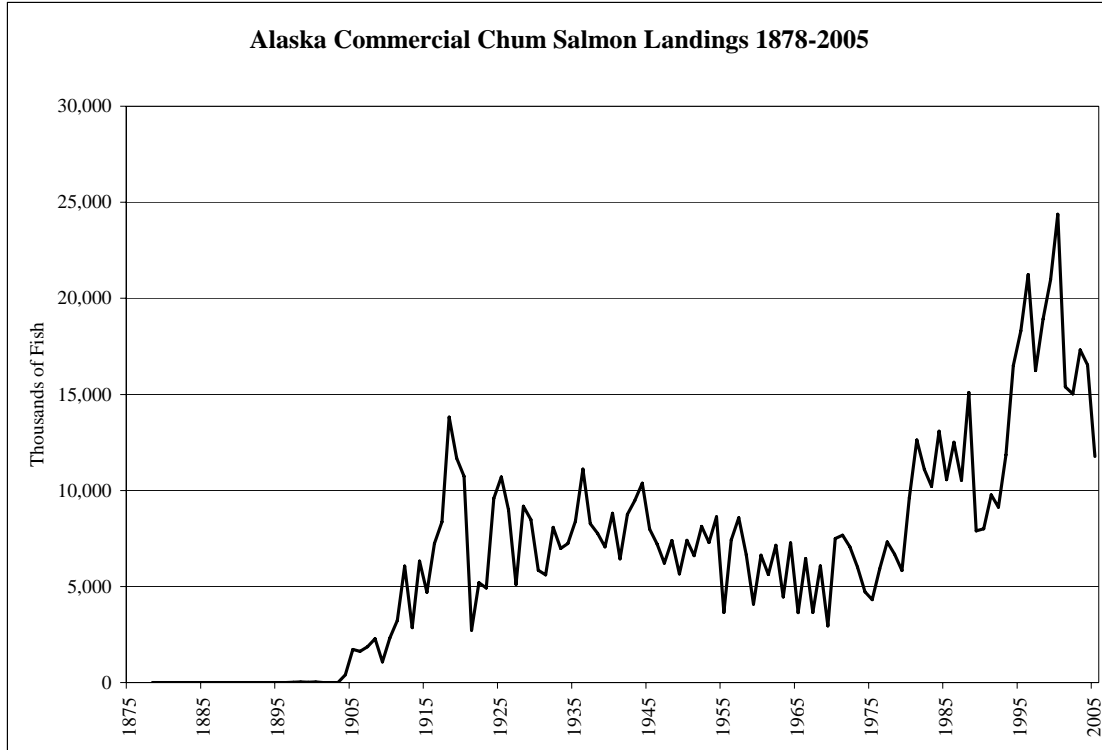
Managed Stock	Gear	Escapement Assessment	Stock Status
Naknek River	Drift Gillnet/Set Gillnet	Tower	Healthy
Alagnak River	Drift Gillnet/Set Gillnet	Tower	Healthy
Kvichak River	Drift Gillnet/Set Gillnet	Tower	Management Concern
Wood River	Drift Gillnet/Set Gillnet	Tower	Healthy
Nushakak Mulchatna River	Drift Gillnet/Set Gillnet	Sonar Count	Healthy
Igushik River	Drift Gillnet/Set Gillnet	Tower	Healthy
Togiak River	Drift Gillnet/Set Gillnet	Tower	Healthy
<b>Bristol Bay Chum Salmon</b>			
Nushagak River	Drift Gillnet/Set Gillnet	Sonar Count	Healthy
Togiak River	Drift Gillnet/Set Gillnet	Aerial Survey	Healthy
<b>Bristol Bay Chinook Salmon</b>			
Nushagak River	Drift Gillnet/Set Gillnet	Sonar Count	Healthy
Togiak River	Drift Gillnet/Set Gillnet	Aerial Survey	Healthy
Naknek River	Drift Gillnet/Set Gillnet	Aerial Survey	Healthy
<b>Bristol Bay Coho Salmon</b>			
Nushagak River	Drift Gillnet/Set Gillnet	Sonar Count	Healthy
Togiak River	Drift Gillnet/Set Gillnet	Aerial Survey	Healthy
Kulukak River	Drift Gillnet/Set Gillnet	Aerial Survey	Healthy



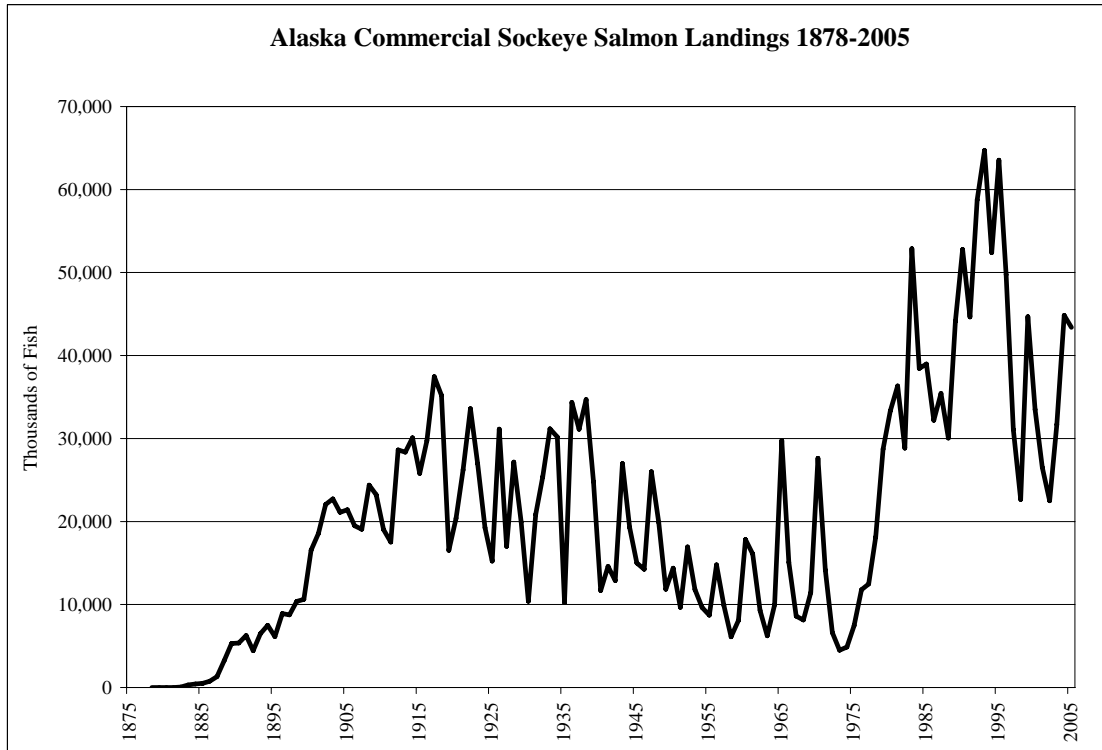
**Figure 2.1 (Historical Figure 5.1).**—Commercial landings of Pacific salmon in Alaska by year, 1978–2005.



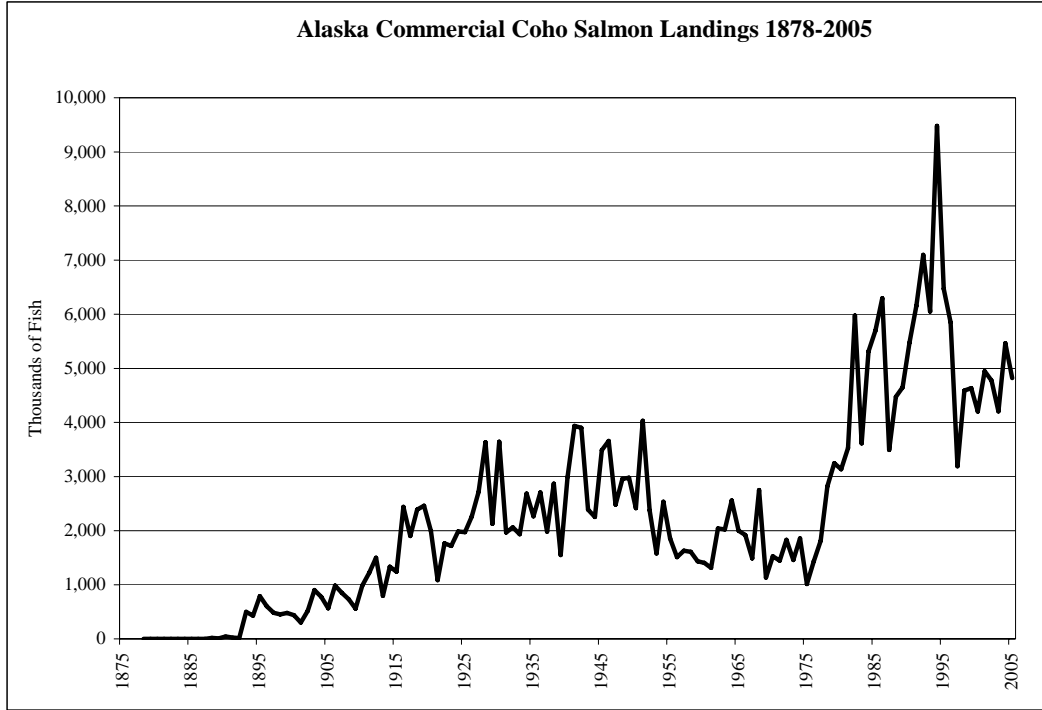
**Figure 2.2 (Historical Figure 5.2).**—Commercial landings of pink salmon in Alaska by year, 1978–2005.



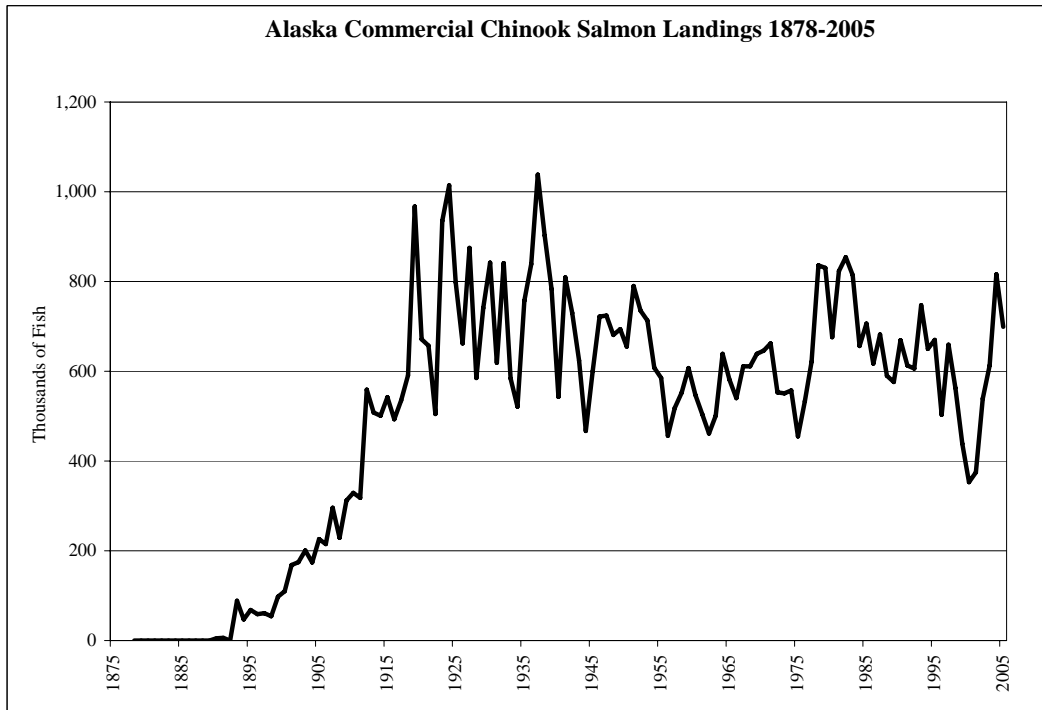
**Figure 2.3 (Historical Figure 5.3).**—Commercial landings of chum salmon in Alaska by year, 1978–2005.



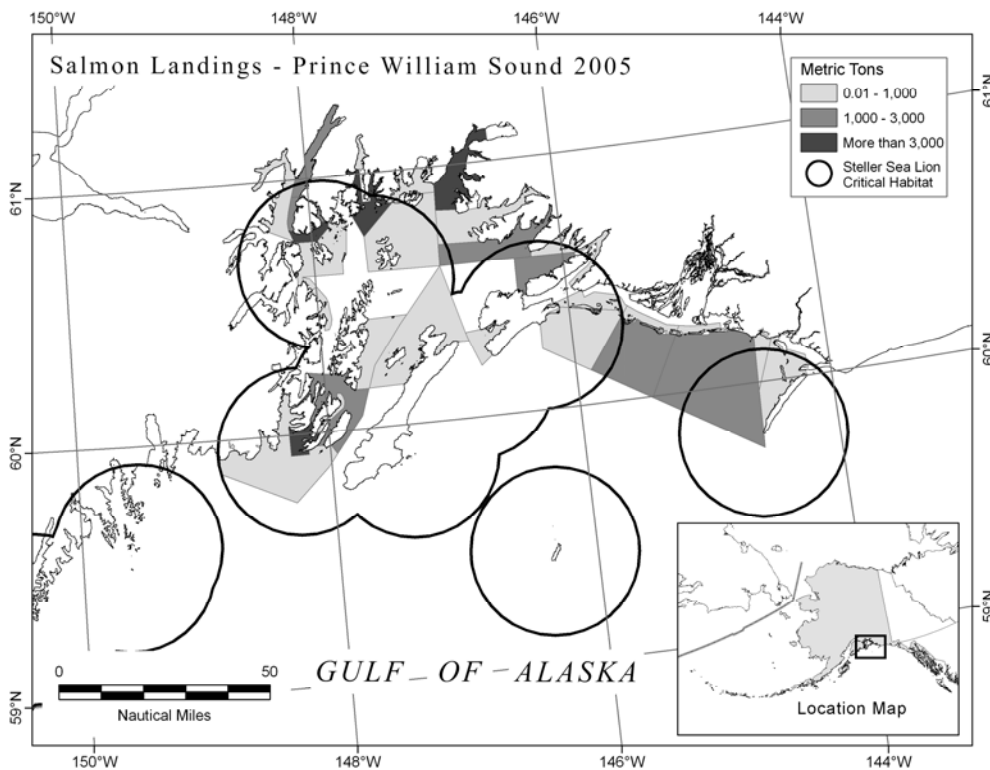
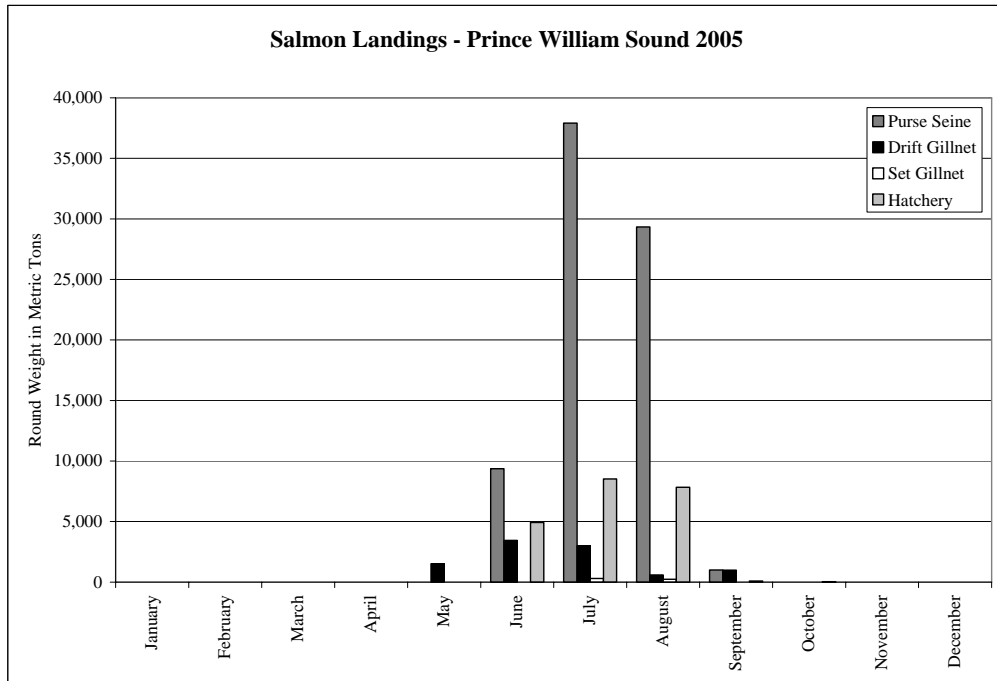
**Figure 2.4 (Historical Figure 5.4).**—Commercial landings of sockeye salmon in Alaska by year, 1978–2005.



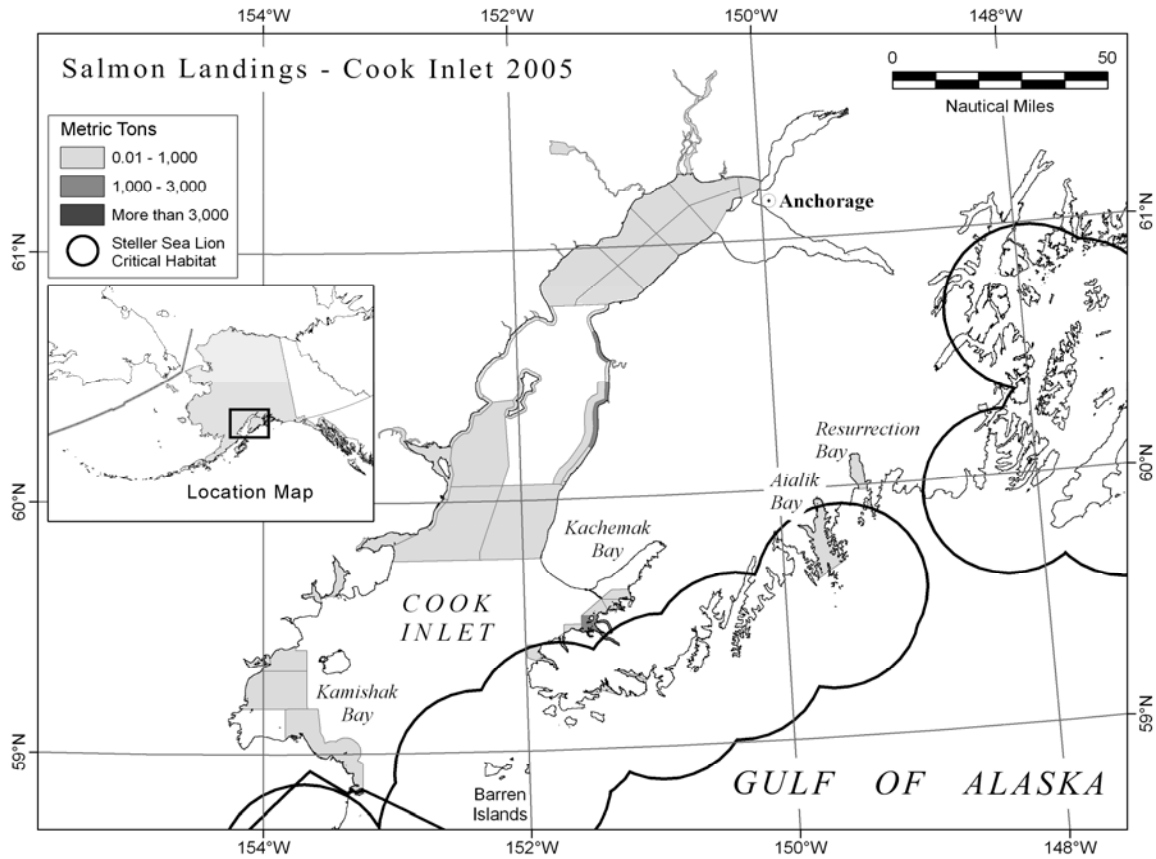
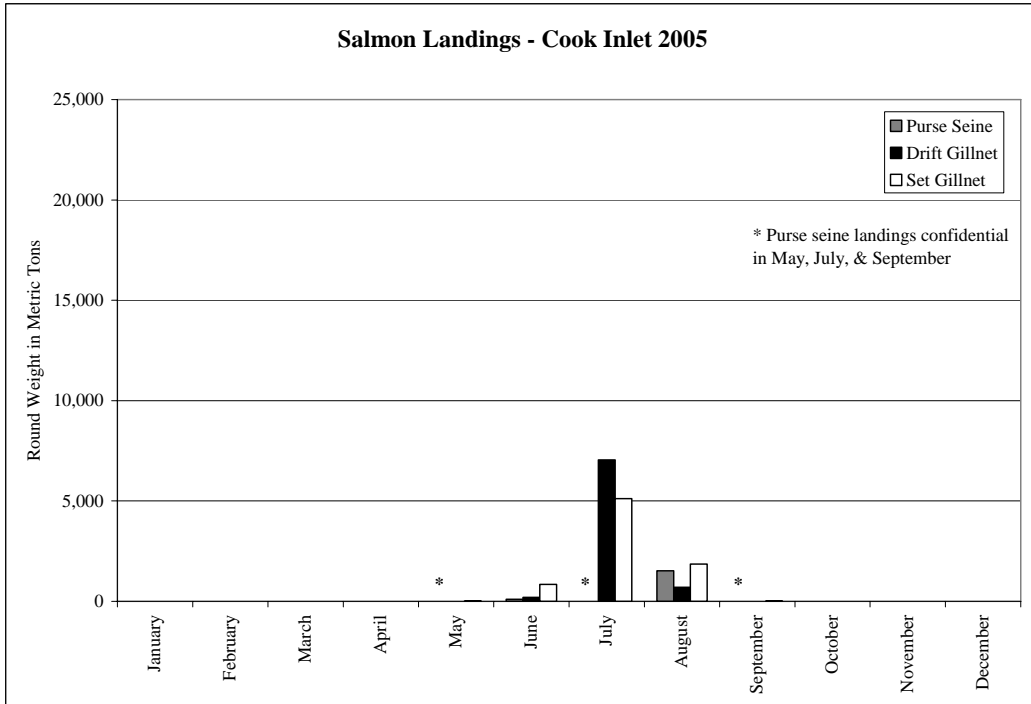
**Figure 2.5 (Historical Figure 5.5).**—Commercial landings of coho salmon in Alaska by year, 1978–2005.



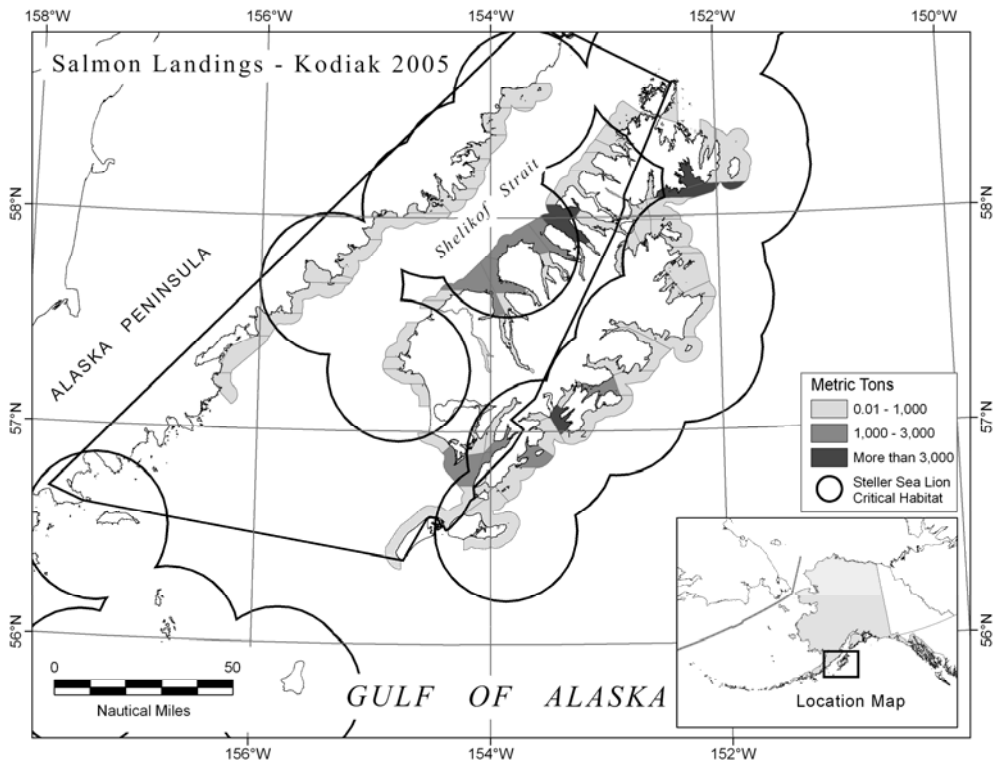
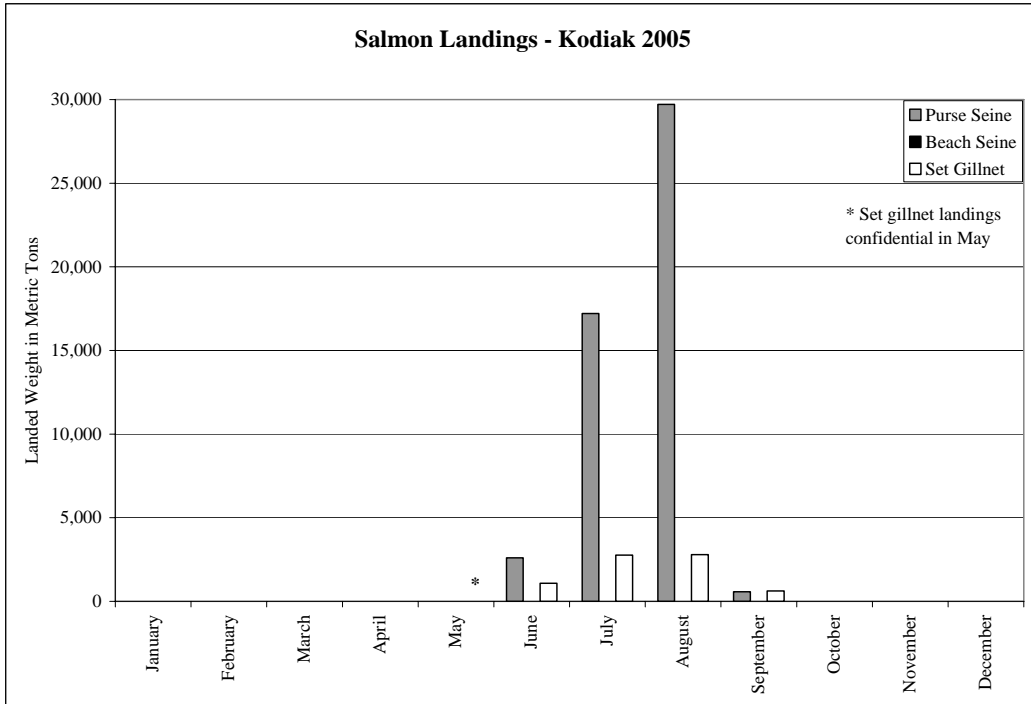
**Figure 2.6 (Historical Figure 5.6).**—Commercial landings of Chinook salmon in Alaska by year, 1978–2005.



**Figure 2.7 (Historical Figure 5.7).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the Prince William Sound management area, 2005 (top), and spatial distribution of salmon landings in the Prince William Sound management area, 2005 (bottom). Note the increase in y-axis scale: 0–25,000 mt in 1999, 0–40,000 mt in 2005.

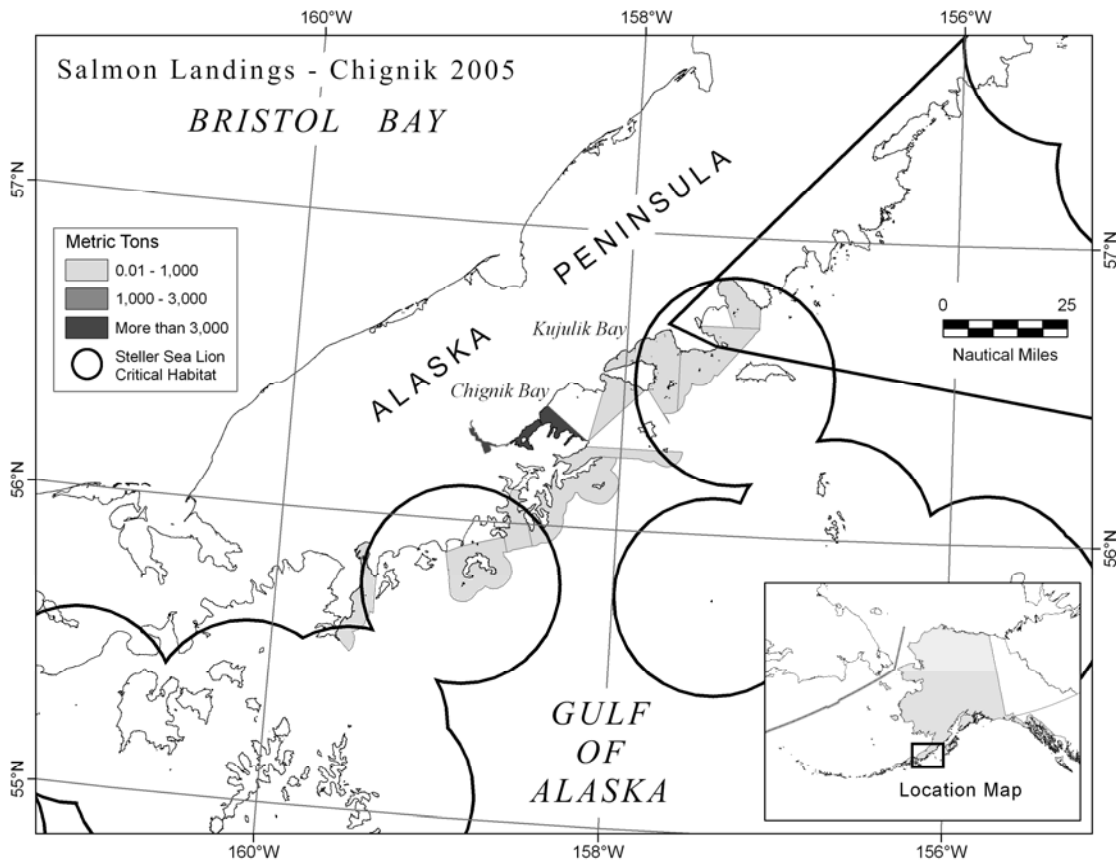
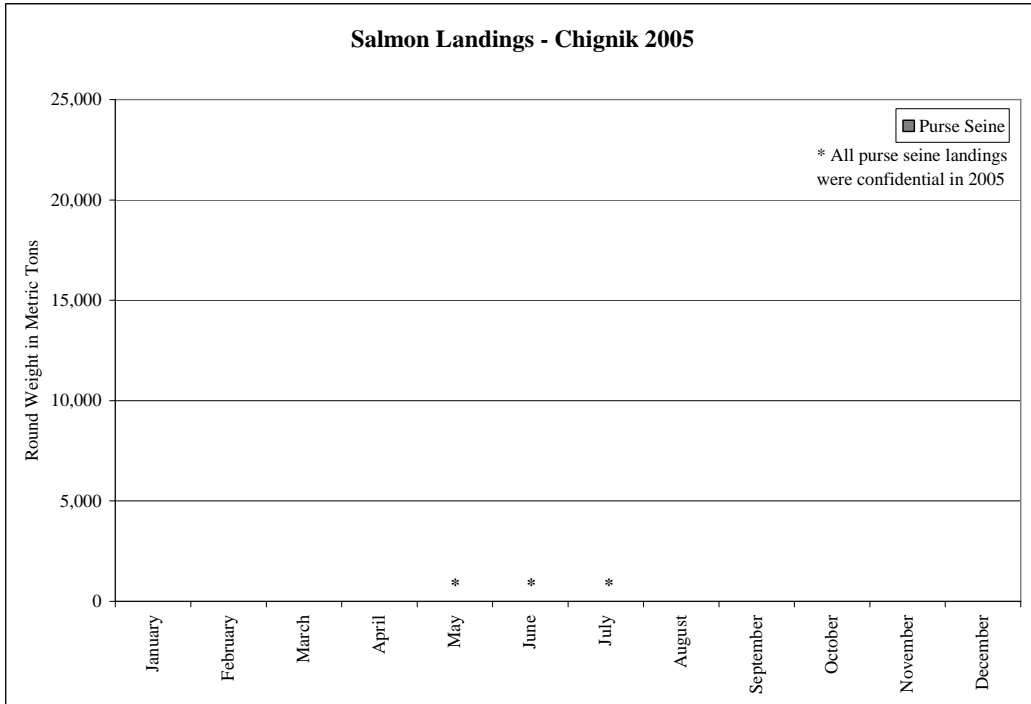


**Figure 2.8 (Historical Figure 5.8).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the Cook Inlet management area, 2005 (top), and spatial distribution of salmon landings in the Cook Inlet management area, 2005 (bottom). \* indicates confidential landings.

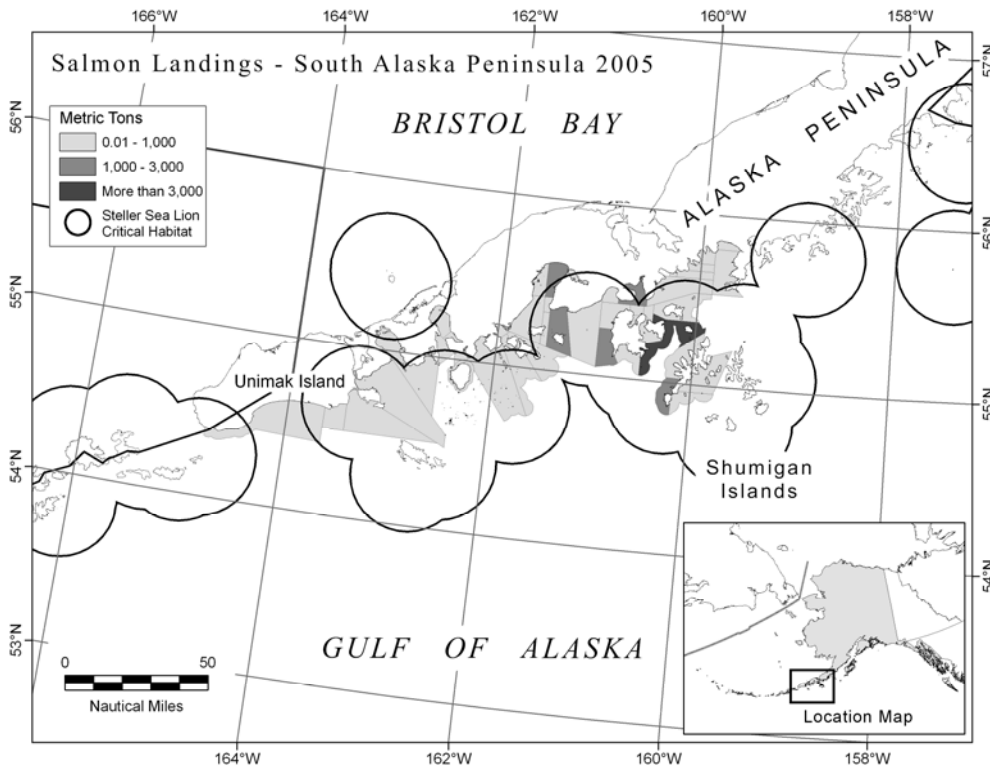
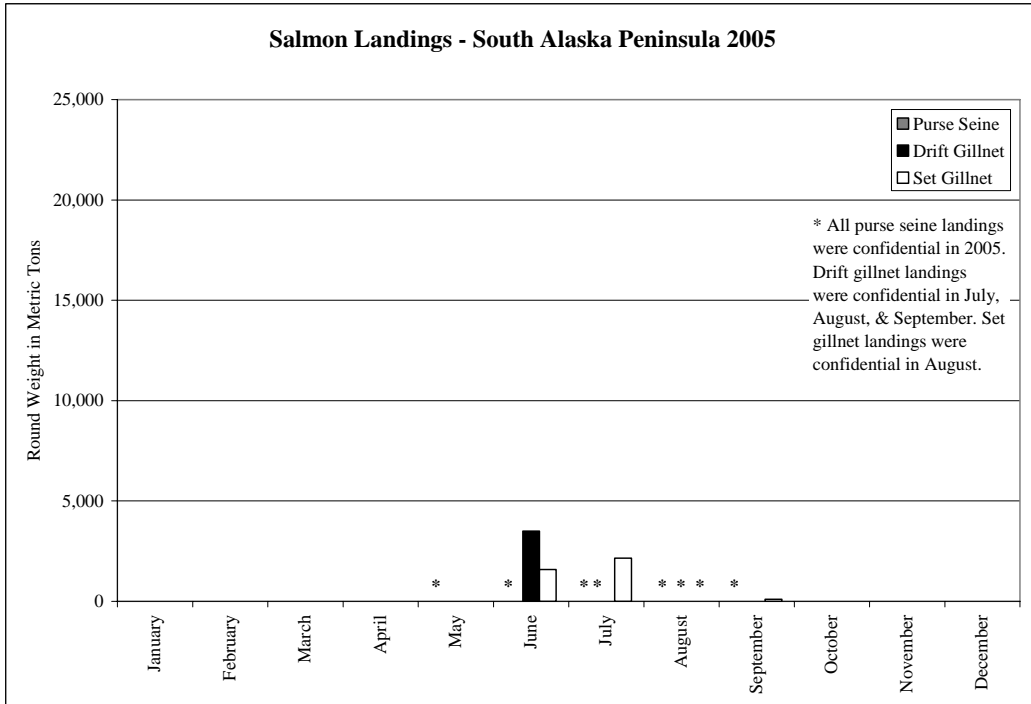


**Figure 2.9 (Historical Figure 5.9).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the Kodiak management area, 2005 (top), and spatial distribution of salmon landings in the Kodiak management area, 2005 (bottom). Note the increase in y-axis scale: 0–25,000 mt in 1999, 0–30,000 mt in 2005. \* indicates confidential landings.

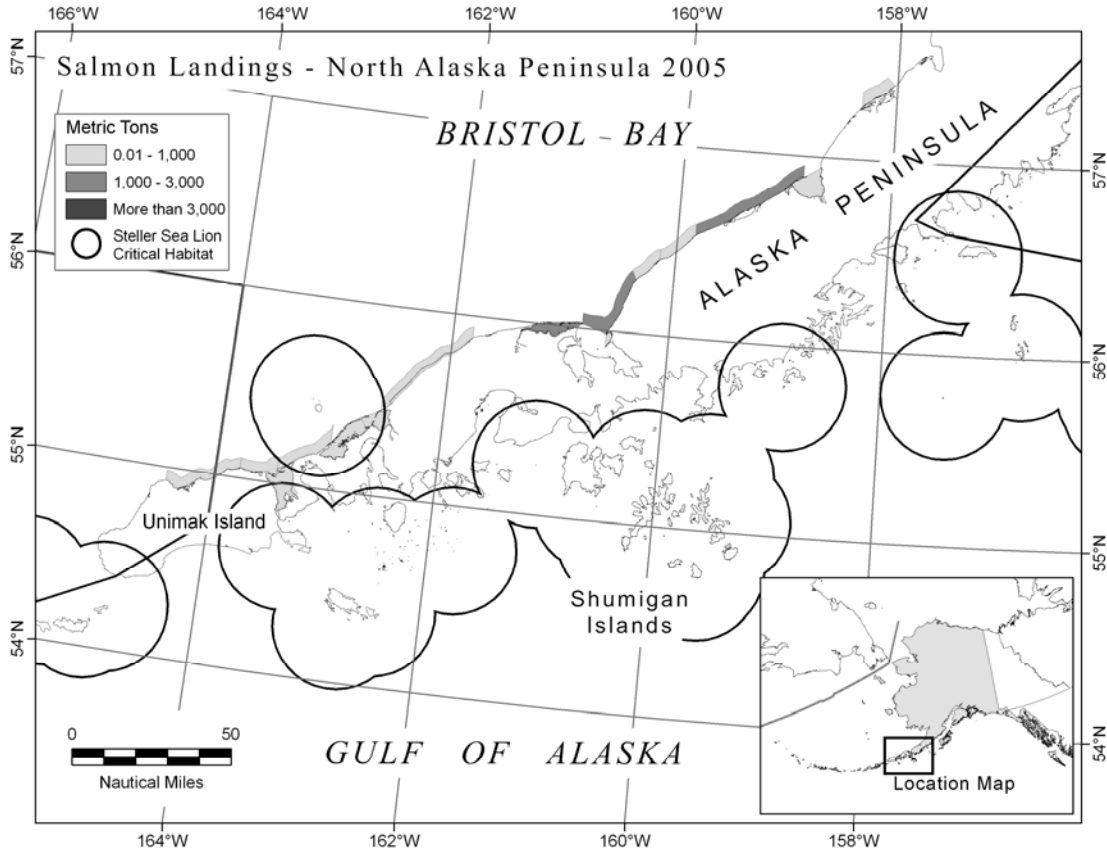
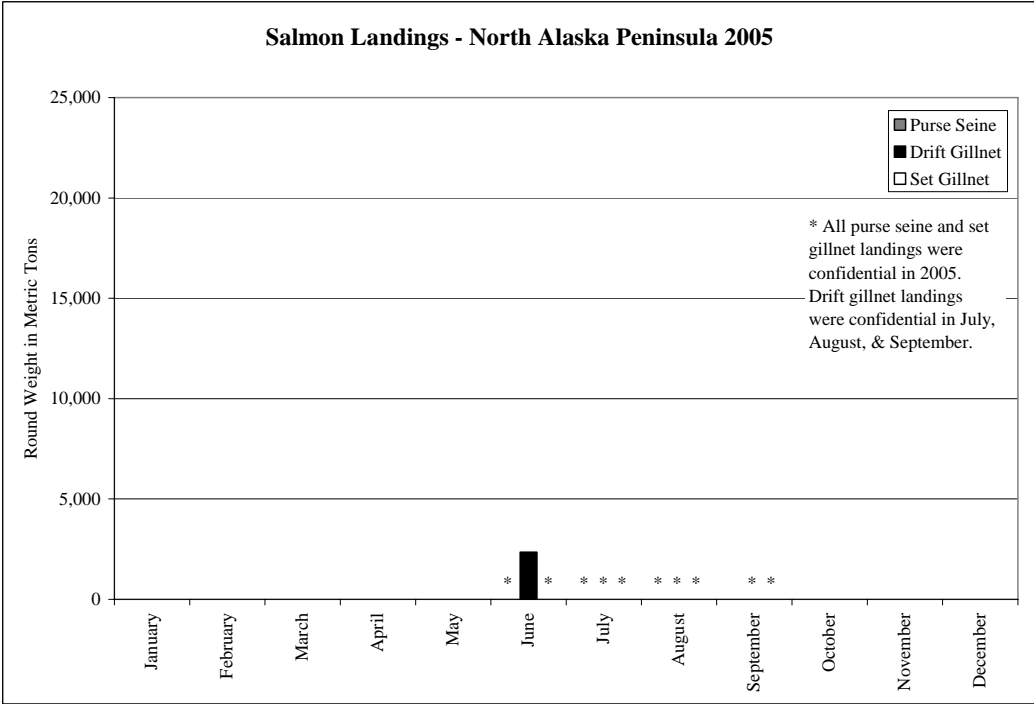




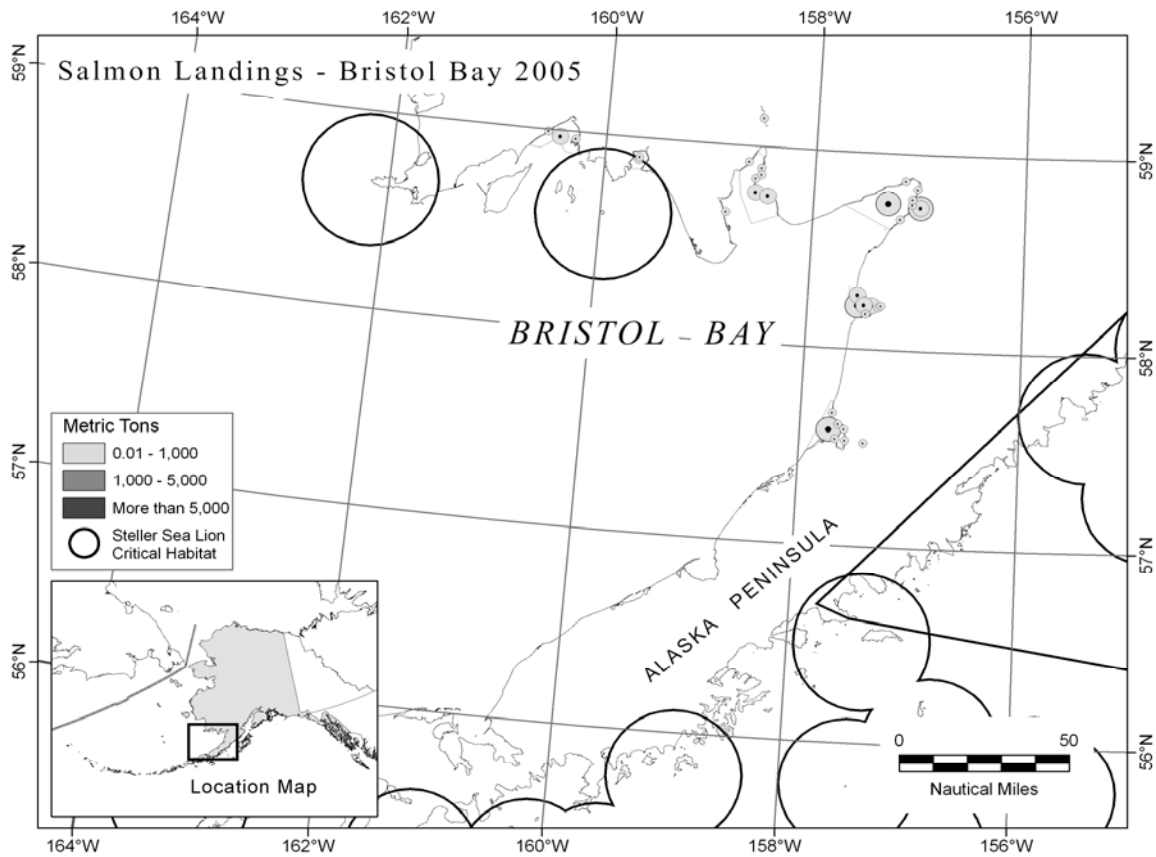
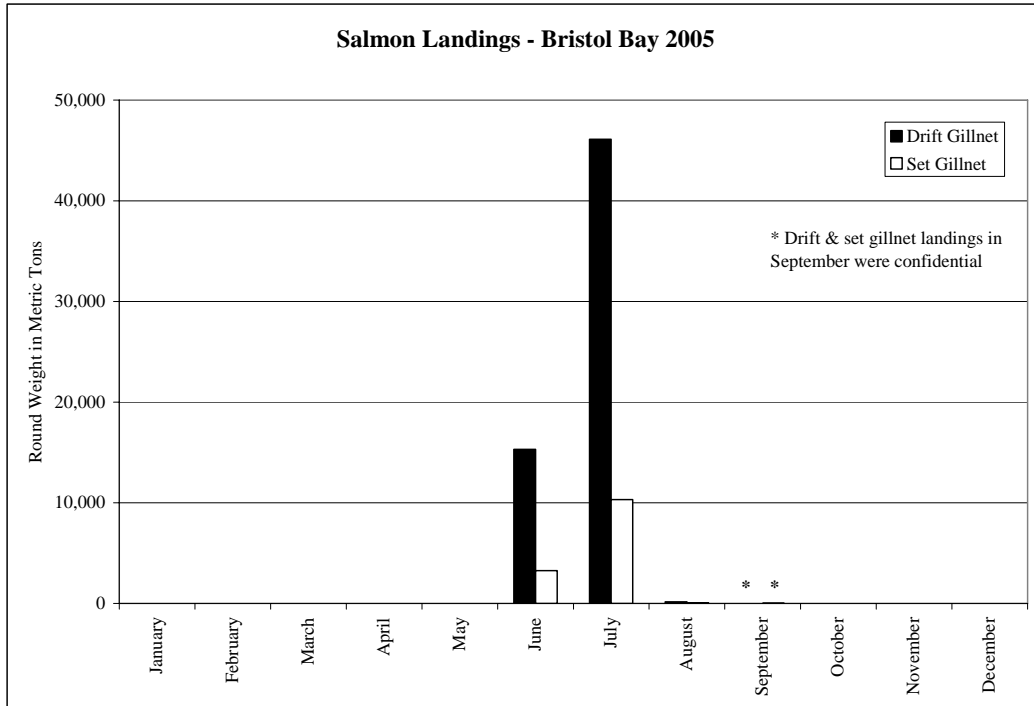
**Figure 2.10 (Historical Figure 5.10).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the Chignik management area, 2005 (top), and spatial distribution of salmon landings in the Chignik management area, 2005 (bottom). \* indicates confidential harvest. \* indicates confidential landings.



**Figure 2.11 (Historical Figure 5.11).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the South Alaska Peninsula management area, 2005 (top), and spatial distribution of salmon landings in the South Alaska Peninsula management area, 2005 (bottom). \* indicates confidential landings.



**Figure 2.12 (Historical Figure 5.12).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the North Alaska Peninsula management area, 2005 (top), and spatial distribution of salmon landings in the North Alaska Peninsula management area, 2005 (bottom). \* indicates confidential landings.



**Figure 2.13 (Historical Figure 5.13).**—Monthly distribution of salmon, *Oncorhynchus* sp., landings in the Bristol Bay management area, 2005 (top), and spatial distribution of salmon landings in the Bristol Bay management area, 2005 (bottom). \* indicates confidential landings.

## **3. INVERTEBRATE FISHERIES (HISTORICAL CHAPTER 6)**

### **3.1. OVERVIEW**

Commercial fisheries addressed in this chapter include crab, shrimp, scallop, clam, urchin, and sea cucumber fisheries west of 144° W longitude (west of Cape Suckling) in both state waters (0–3 nm offshore) and federal waters (3–200 nm offshore). Information on fishery history, management strategies, and gear used were reported previously by Kruse et al. (2000). Readers interested in comparing fishery status in 2005 with status in 1999 are advised to refer to the 2000 report, particularly for comparisons of catch locations and seasonal harvest trends.

Some shellfish seasons cross calendar year boundaries, and this can create confusion when reporting catches. To provide the most up to date information in this report, we provide landings data for the 2005/2006 season where the season included months from both years. Examples include the king and Tanner crab fisheries of the Bering Sea and Aleutian Islands (BSAI) as well as scallops.

### **3.2 STATUS OF CRAB FISHERIES IN THE 2005/2006 SEASON**

Status of some crab stocks has improved since 1999, while others remain in poor condition (Tables 3.1 and 3.2). Notable changes since 1999 have been the recovery of Tanner crab stocks sufficient to allow fisheries in the Kodiak, Chignik, South Alaska Peninsula and eastern Aleutian Islands areas as well as in the eastern Bering Sea.

Crab rationalization, providing individual quota shares of crab to harvesters and processors, was put into effect in 2005 for BSAI stocks of king and Tanner crab. An important effect of this change includes potentially prolonged seasons, given that harvesters have greater freedom to choose when to fish for their individual quota shares. The start date for BSAI king and Tanner crabs was modified as well, such that all fisheries for king and Tanner crab (including snow crab) now begin on October 15, with the exception of Aleutian Islands golden king crab, which begins August 15.

#### **3.2.1 Crab Fisheries Prosecuted in the 2005/2006 Season**

Crab fisheries that opened in the 2005/2006 season include red king crab fisheries in Bristol Bay and Norton Sound; Tanner crab fisheries in Kodiak, Chignik, South Alaska Peninsula, eastern Aleutian Islands, and the eastern Bering Sea areas; snow crab in the Bering sea; golden king crab in the Aleutian Islands; and Dungeness crab in the BSAI and Kodiak areas (Tables 3.1 and 3.4). The Bristol Bay red king crab stock has shown a steady increase in biomass this decade, allowing gradual increases in harvests (Figure 3.1), including a total allowable catch (TAC) of 8,770 mt for the season October 15, 2005 through January 15, 2006. Catches came from outer Bristol Bay between 161° and 165° W longitude (Figure 3.2). The Norton Sound red king crab fishery harvested 184 mt beginning in January, 2005 in the ice-based fishery, with the bulk of the catch coming in June and July during the boat-based fishery (Table 3.1 and Figure 3.3). Catches were made mostly in central and western Norton Sound as well as in the northern district between Port Clarence and Cape Prince of Wales.

Golden king crab harvests in the eastern section of the Aleutian Islands management area totaled 1,288 mt for the new IFQ season beginning August 15 (Figure 3.4). These harvests were taken between 169° and 174° W longitude in a pattern more widely dispersed to the west than in 1999 (Figure 3.5). Harvests were primarily from August through November. Golden king crab

harvests in the western section were confidential and occurred September, 2005 through March, 2006, from Adak Island in the east to Shemya Island in the west (Figure 3.6).

The eastern Bering Sea Tanner crab fishery opened in October 2005 with a TAC of 735 mt. This was the first opening since 1997 (Figure 3.7). The fishery harvested 432 mt, on both the southeast and northwest sides of the Pribilof Islands with harvests taken October, 2005 through March, 2006, peaking in March (Figure 3.8). The eastern Aleutian district opened on January 15, 2006 for Tanner crab in Makushin and Skan Bays of Unalaska Island, closing on January 21, 2006 with 38.14 mt landed. These areas are outside of SSL critical habitat (Figure 3.9).

The Kodiak Tanner crab fishery opened in 2001 for the first time since closing in the 1994/1995 season. The fishery has opened each year since then including the 2005/2006 season, beginning January 15, 2006 with a Guideline Harvest Level (GHL) of 953 mt. Primary harvest areas were on the east side of the island, and these peaked in January with decreasing monthly catches through March (Figure 3.10). The Chignik and South Peninsula districts opened at the same time reaching preliminary total harvests of 56 and 134 mt, respectively, distributed across wide areas of each district (Figures 3.11 and 3.12) with peak catches in January.

The snow crab fishery, declared over fished in 1999, has seen low stock sizes and reduced harvests under a rebuilding plan implemented in 2000 (Figure 3.13). The harvest of 11,291 mt in the 2005/2006 season was taken primarily from the outer shelf between 170° and 179° W longitude, NW of the Pribilof Islands (Figure 3.14), indicating a shift to the west and northwest of harvest locations reported for 1999. Peak harvests were January to April.

Dungeness crab harvests in the Kodiak area totaled 177 mt in 2005. These were landed from May through October, with peak catches in July and August (Figure 3.15). Harvest locations were primarily on the east and south sides of the island in nearshore, shallow waters. Approximately 65 mt of Dungeness crab were harvested from nearshore waters of the Alaska Peninsula and eastern Aleutian Islands from July to September, 2005 (Figure 3.16).

### **3.2.2 Crab Fisheries Not Opened in the 2005/2006 Season**

Several stocks of king crab remain depressed and are closed to fishing (Table 3.2). These include red king crab stocks in Kodiak, South Alaska Peninsula, and Aleutian Islands management areas (all closed since the 1983/1984 season), lower Cook Inlet (closed since the 1984/85 season), and PWS (closed since the 1992/1993 season). The red king crab fishery in the Pribilof Islands remains closed since 1999, not due to stock conditions but due to low precision of annual abundance estimates and to the overlap with the blue king crab stock for which there are bycatch concerns.

The blue king crab stock in the Pribilof Islands was declared over fished in 2002 and this fishery has been closed since 1999 (Figure 3.17). Despite the long closure the stock continues to decline. The St. Matthew blue king crab stock was declared over fished in 1999, the year the fishery was closed, and the fishery has remained closed since then. Both stocks of blue king crab are managed under rebuilding plans.

Tanner crab fisheries in PWS and Cook Inlet management areas remained closed in 2005/2006, as did golden king crab fisheries in PWS, Kodiak, and the South Peninsula, as well as the hair crab (formerly “Korean hair crab”) fishery in the Bering Sea (Figure 3.18) and Dungeness crab fisheries in PWS and Cook Inlet (Table 3.3; Figure 3.19).

### **3.3 STATUS OF OTHER INVERTEBRATE FISHERIES IN THE 2005/2006 SEASON**

The status of other invertebrate fisheries was similar in 2005 to the status in 1999. The major trawl shrimp fisheries that were once highly productive in the central Gulf of Alaska (CGOA) and the western Gulf of Alaska (WGOA) have not recovered to any appreciable degree (Woodby et al. 2005), and several former pot shrimp fisheries remain closed, including pot fisheries in PWS and Cook Inlet. The Cook Inlet and Bering Sea shrimp trawl fisheries also remained closed.

Small scale shrimp trawl fisheries were prosecuted in 2005 in PWS for sidestriped shrimp and in Kodiak waters (northwest side) primarily for northern shrimp (Figure 3.20). Harvests totaled 39.3 mt taken April through September (Figure 3.21). Due to the small number of vessels participating, the monthly landing totals are confidential. There were directed shrimp harvests in the Bering Sea in 2005.

The weathervane scallop fishery has undergone several changes since 1999. In May of 2000 six of the 9 federal license holders formed the North Pacific Scallop Cooperative, which now regulates the allocation of catch among member vessels. The effect has been to reduce the number of vessels fishing and, in certain cases, to lengthen the period of fishing within the season, July 1 to February 15. In the 2005/2006 season there were 4 vessels harvesting scallops with total landings of 142 mt (preliminary data). Landings have been on a downward trend since 1996 (Figure 3.22). Fisheries were opened in PWS (Figure 3.23), lower Cook Inlet, Kodiak, the South Alaska Peninsula, and the Bering Sea (Figure 3.24), but closed in the Dutch Harbor area. The fishery in Kodiak waters occurred in two districts: the northern end of the Shelikof Strait district, and on the east side of Kodiak Island in the Northeast district (Figure 3.25). Closing dates in the Kodiak registration area were December 11, 2005 in the Shelikof district and January 17, 2006 in the northeast district. The Bering Sea fishery remained open until the regulatory closing date of February 15. No landings were made from the South Alaska Peninsula.

The dive fishery for red sea cucumbers in nearshore Kodiak waters has produced stable landings beginning in 1995 (Figure 3.26). The 2005/2006 season opened October 1 and landed 68.3 mt with peak harvests in October (Figure 3.27). Dive harvest locations extended nearly the length of Kodiak Island's east side, and were also active in a few bays on both sides of Shelikof Strait. Small harvests of sea cucumbers were also taken in the Chignik area totaling less than 5 mt in 2005. The nearshore dive fishery for green sea urchins was open in 2005 but there was no participation.

A variety of other invertebrate fisheries occurred in 2005, including a razor clam fishery on sandy beaches of Cook Inlet and a littleneck clam fishery in the intertidal of lower Cook Inlet (landings data for both are confidential). Octopus and squid landings were minimal, with specific amounts confidential due to the small number of participants.

### **3.4 OVERLAP OF INVERTEBRATE FISHERIES AND STELLER SEA LION CRITICAL HABITAT**

The degree of overlap of invertebrate fisheries with SSL critical habitat varies substantially between fisheries, and there have been a few changes since the 2000 report. The major crab fisheries for snow crab and for red king crab in the Bering Sea have the most fishing effort but only little overlap with SSL critical habitat. The snow crab fishery has become increasingly concentrated to the northwest of the Pribilof Islands outside of SSL critical habitat. The golden

king crab fishery in the Aleutian Islands overlaps SSL critical habitat extensively, as was demonstrated in the 2000 report. The eastern Aleutian Islands fishery extended further west in 2005 as compared to 1999. The recently re-opened Tanner crab fisheries in the CGOA and WGOA near Kodiak, Chignik, and South Alaska Peninsula overlap extensively with SSL critical habitat in mid-winter. Harvest effort for Dungeness crab that was previously reported along the north and west coastline of Shelikof Strait, including areas of SSL critical habitat, did not occur in 2005. Dungeness crab harvests elsewhere along Kodiak Island's east shore and on the south side of the Alaska Peninsula were largely within SSL critical habitat.

### **3.5 DIRECT FISHERY INTERACTIONS**

Incidental harvest of sea lions in the state-managed invertebrate fisheries has not been documented to this date.



**Table 3.1 (Historical Table 6.1).**—Status of invertebrate fisheries in the central and westward regions of Alaska (west of 144° W longitude) for which landings were available in 2005, or the 2005/2006 season.

Fishery	Gear	Assessment Method	Stock Definition	Stock Biomass (mt)	Stock Status		Federal Overfishing Definition		Harvest Rate Policy		State Fishery Threshold (mt)	Season	Catch (mt)	Remarks (GHL & GHR in mt)
					Level	Trend	FMSY	Biomass MSST (mt)	Framework	2005				
<b>Crabs:</b>														
Norton Sound RKC	Pot	SSA & ASA	LM > 121 mm CW	2,812 LM (2002)	Aver.	Increasing	None		0–10% LM	6.5% LM	680 LM for summer fishery	1Jul–3Sep, 15Nov–15May	184	168 GHL
Bristol Bay RKC	Pot	LBA & ASA	MMF	82,509 MMF, ESB 30,840	Low	Increasing	0.2	20,321MMF	0–15% MM>120 mm CL	15% MM	8.4 million MF crabs > 89 mm CL ESB 6,577	15Oct 05–15Jan 06	8,369	TAC 7,918
Pribilof Is. GKC	Pot	FPA	LM > 140 mm CW	No est.	Aver.	Stable	0.2		0–20% LM	18% LM	None	1Jan – 31Dec	28 (2004/2005 season)	GHL 68
E Aleutian Is. GKC	Pot	FPA	LM > 140 mm CW	No est.	Aver.	Stable	0.2		0–20% LM	18% LM	None	15Aug.'05–15 May '06	1,165	TAC 1,225
Bering Sea SC (Bristol Bay, Pribilof Is., St. Matthew Is.)	Pot	ASA	MMF	277,009 MMF	Low	Increasing	0.3	209,016	0–58% LM >102 mm CW	58% LM >102 mm CW	104,508 TMB	15Oct 05–31May 06	11,291	TAC 16,866
Bering Sea TC	Pot	ASA	MMF	74,208 MMF 14,368 MF	Low	Slightly increasing	0.3	43,001 MMF	5, 10, or 20% of the molting MM abundance or 25% or 50% of the exploitable legal male abundance, whichever is less.	5% molting MM west of 166° W long., 0% east of 166° W long.	Eastern Bering Sea 9,526 MF (>79 mm CW)	15Oct 05–31Mar 06	432	TAC 735
Kodiak TC	Pot	ASA	MM >114 mm CW	21,107	Low	Various by district: stable, declining, depressed	None	None	0–30% LM		6,877,000 MM crabs, min GHL 181	Various, 15Jan–3–31Mar 06	822	GHL 794
Kodiak DC	Pot	FPA	LM > 165 mm CW	No est.	Low	Stable	None		3S	3S	None	1 May–1 Jan in all areas, 15 Jun.–1 Jan. in the south	177	None: (3S)

-continued-

**Table 3.1**—Page 2 of 2.

Fishery	Gear	Assessment Method	Stock Definition	Stock Biomass (mt)	Stock Status		Federal Overfishing Definition		Harvest Rate Policy		State Fishery Threshold (mt)	Season	Catch (mt)	Remarks (GHL & GHR in mt)
					Level	Trend	FMSY	Biomass MSST (mt)	Framework	2005				
<b>Other Invertebrates:</b>														
PWS Scallop	Dredge	ASA	“population meat”	433 (*04 survey)	Aver.	Stable	None	None	0–10%	5%	None	July1– Aug13 and Aug22 by area	22	GHL: 22 shucked meat; 8.7 & 2.7K Tanner crabs bycatch, east & west
Kodiak Scallop	Dredge	CPUE	Undefined	No Est.	Aver.	Stable	0.13		0 –HMC			July1–Feb15	109	GHR:0–136 shucked meat, 0–562 (entire region)
Peninsula Scallop	Dredge	CPUE	Undefined	No Est.	Low	Decline	0.13		0 –HHC			July1–Feb15	34	GHR:0–91 shucked meat, 0.5 or 1% crab bycatch cap, 0– 562 (entire region)
Bering Sea Scallop	Dredge	CPUE	Undefined	No Est.	Aver.	Stable	0.13	562  (entire region)	0–9%	UK	None	July1–Feb15	10	Bycatch cap of 1% or 0.5% crab stock , GHR:0– 181shucked meat

LM: legal male; CW: carapace width (including spines); CL: carapace length; MM: mature male; MF: mature female; MMF: mature male and female; CPUE: catch per unit effort; F<sub>MSY</sub>: Maximum fishing mortality threshold; MSST: minimum stock size threshold; Harvest Rate: percentage of the estimated mature or legal male biomass; HMC: historical mean catch; HHC: historical high catch; HRV: stair-step harvest rate on molting mature male at other higher stock size levels; RKC: red king crab; BKC: blue king crab; TC: Tanner crab; SC: snow crab; GKC: golden king crab; DC: Dungeness crab; SSA: length-based stock synthesis analysis; LBA: length-based analysis; ASA: area swept analysis; CSA: catch survey analysis; FPA: fishery performance analysis; PSC: prohibited species catch limits for groundfish trawlers; MABI: minimum acceptable biomass index; 3S: sex, size, season; GHL: guideline harvest level; GHR: guideline harvest rate; CDQ: community development quota; ESB: effective spawning biomass—successfully mating mature female biomass; UK: unknown; PWS: Prince William Sound; No Est.: no estimation; Aver.: average level; Incr.: increase.

**Table 3.2 (Historical Table 6.2).**—Status of non-active invertebrate fisheries in the central and westward regions of Alaska (west of 144° W longitude).

Fishery	Gear	Assessment Method	Stock Definition	Stock Size in 2005 (mt/no)	Stock Status Level Trend		Federal Overfishing				State Fishery Threshold (mt/no)	Remarks (GHL in mt)
							Definition		Harvest Rate Policy			
							F <sub>MSY</sub>	Biomass MSST (mt)	Framework	2005		
<b>Crabs:</b>												
PWS RKC	Pot	FPA	LM>178 mm CW		Low	Decline	None	None		0	None	Closed since 1992/1993
Lower Cook Inlet RKC	Pot	FPA	LM>178 mm CW		Low	Decline	None	None		0	None	Closed since 1984/1985
Kodiak RKC	Pot	ASA	MM	7,053 fertilized female crabs	Low	Decline	None	None	0–20% MM > 130 mm CL	0	5.12 million fertilized female crabs	Closed since 1983/1984, 60% cap on LM harvest
Peninsula RKC	Pot	ASA	LM > 190 mm CW	23,675 crabs	Low	Decline	None	None	0–20% LM	0	None	Closed since 1983/1984
Pribilof Is. RKC	Pot	ASA&CSA	MMF	5,806 MMF, small stock	High	Stable	0.2	1,497 MMF	0–20% MM > 120 mm CL	0	None	Closed in 1999 because no BKC fishery, low precision biomass estimate GHL: 227
Western Al. Is. RKC	Pot	FPA	LM > 165 mm CW	No Est.	Low	Decline	None	None	0–20% LM		None	
Eastern Al. Is. RKC	Pot	FPA	LM > 165 mm CW	No Est.	Low	Stable	0.2	None	0–20% LM		None	0 (subsistence annually)
PWS BKC	Pot	FPA	LM>150 mm CW	No Est.	Low	Decline	None	None		0		Closed since 1992/1993
Pribilof Is. BKC	Pot	ASA&CSA	MMF	726 MMF	Low	Decline	0.2	2,994 MMF	0–20% MM > 120 mm CL	0	5,987 MM F for 2 yrs, min TAC>252 LM	Closed in 1999, 60% cap on LM harvest
St. Matthew Is. BKC	Pot	ASA&CSA	MMF	2,676 MMF (ASA)	Low	Decline	0.2	4,990 MMF	0–20% MM > 105 mm CL	0	1,315 MM, min. GHL 1,134	Closed in 1999, 20% cap on LM harvest
PWS GKC	Pot	FPA	LM>178 mm CW	No Est.	Small Low	Decline	None				None	Closed since 1992/1993, confidential catch in 1994/1995, GHL 18-27
Peninsula GKC	Pot	None	LM > 165 mm CW	No Est.	UK	UK	None		None		None	
Kodiak GKC	Pot	None	LM > 165 mm CW	No Est.	UK	UK	None		None		None	
Pribilof Is. HC	Pot	ASA	LM > 82.5 mm CW	130,000 LM	Low	Decline	None		0–20% LM	0% LM	None	Closed
PWS TC	Pot	FPA	LM>135 mm CW	No Est.	Low	Decline	None		None		None	Closed since 1989
Cook Inlet TC	Pot	FPA	LM>140 mm CW	No Est.	Low	Some areas incr.	None		None		395,000 MM, GHL 100,000 in south	Closed since 1995
W Aleutian TC	Pot	None	LM > 140 mm CW	No Est.	UK	UK	0.3	None	None		None	Bycatch from RKC fishery
Bering Sea & Aleutian Is. TTC&GTC	Pot	FPA	LM > 127 mm CW	No Est.	UK	UK	0.3	None	GHL set using FPA		None	Sporadic harvest

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**Table 3.2**–Page 2 of 2.

Fishery	Gear	Assessment Method	Stock Definition	Stock Size in 2005 (mt/no)	Stock Status		Federal Overfishing Definition		Harvest Rate Policy		State Fishery Threshold (mt/no)	Remarks (GHL in mt)
					Level	Trend	F <sub>MSY</sub>	Biomass MSST (mt)	Framework	2005		
PWS DC	Pot	FPA	LM > 165 mm CW	No Est.	Low	Decline	None	None	3S	3S	None	Orca Inlet fishery closed since 1980, Copper River fishery closed since 1993
Lower Cook Inlet DC	Pot	FPA	LM > 165 mm CW	No Est.	Low	Decline	None	None	3S	3S	None	Southern district closed since 1991, others since 1997
PWS Shrimp	Pot				Low		None	None	None		None	Last open in 1991
Cook Inlet Shrimp	Pot				Low		None	None	None		None	Last open in 1997
Kodiak Green Sea Urchin	Diving	None	Undefined (market prefers > 51–57 mm diameter)	Small, UK	UK	UK	None	None	Permit		None	No interest (lack of market)
Dutch Harbor Reg. Area Scallop	Dredge	CPUE	Undefined	No Est.	Low	Decline	0.13	562 (entire state)	0–9%	UK	None	Bycatch cap of 1% or 0.5% crab stock , GHR:0–50 shucked meat. Closed since 2003/2004.

LM: legal male; CW: carapace width (including spines); CL: carapace length; MM: mature male; MMF: mature male and female; MF: mature female; HRV: stair-step harvest rate on molting mature male at other higher stock size levels; F<sub>MSY</sub>: Maximum fishing mortality threshold; Harvest Rate: percentage of the estimated legal male biomass; MSST: minimum stock size threshold; RKC: red king crab; BKC: blue king crab; GKC: golden king crab; TC: Tanner crab; TTC: triangle Tanner crab; GTC: grooved Tanner crab; DC: Dungeness crab; HC: hair crab; LBA: length-based analysis; ASA: area swept analysis; FPA: fishery performance analysis; UK: unknown; No Est.: no estimation; Incr.: increase.

**Table 3.3 (Historical Table 6.3).**—Status of invertebrate fisheries in the central and westward regions of Alaska (west of 144° W longitude) for which landings were insignificant (<10 mt) in 2005.

Fishery	Gear	Assessment Method	Stock Definition	Stock Biomass (mt)	Stock Status		Federal Overfishing Definition		Harvest Rate Policy		State Fishery Threshold (mt/no)	Season	Catch (mt)	Remarks (GHL or GHR in mt)
					Level	Trend	F <sub>MSY</sub>	Biomass MSST (mt)	Framework	2005				

Note: All invertebrates for which landings were insignificant, were also confidential (however, not all confidential landings were insignificant). See table 6.4.

**Table 3.4 (Historical Table 6.4).**—Status of invertebrate fisheries in the central and westward regions of Alaska (west of 144° W longitude) for which landings were confidential (\*) in 2005, or the 2005/2006 season.

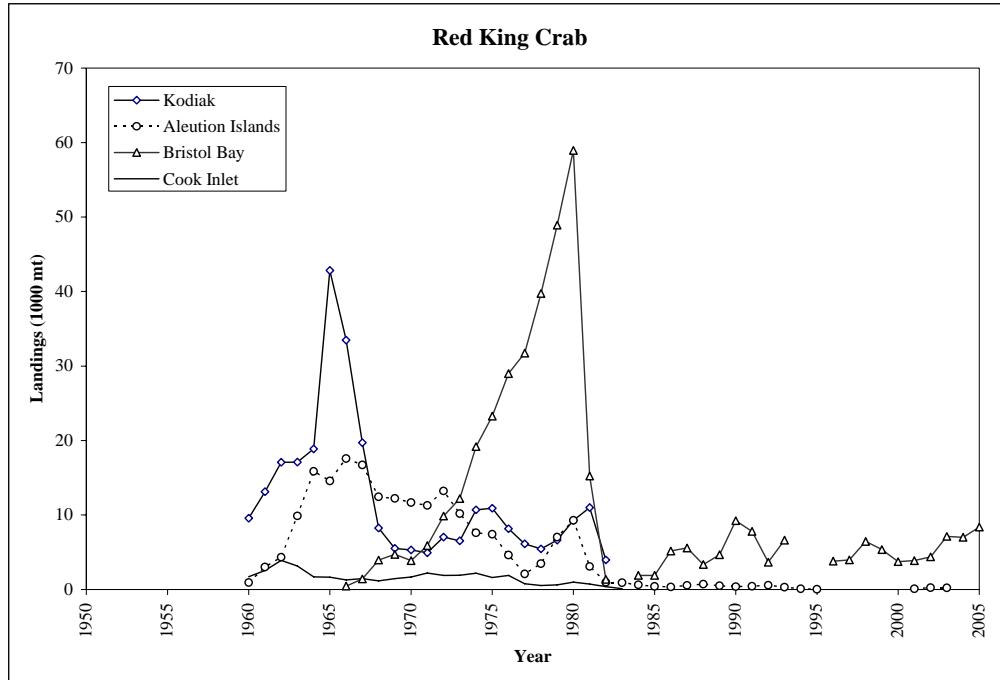
Fishery	Gear	Assessment Method	Stock Definition	Stock Biomass (mt)	Stock Status		Federal Overfishing Definition		Harvest Rate Policy		State Fishery Threshold (mt/no)	Season	Catch (mt)	Remarks (GHL or GHR in mt)
					Level	Trend	F <sub>MSY</sub>	Biomass MSST (mt)	Framework	2005				
<b>Crabs:</b>														
Chignik TC	Pot	ASA	MM > 114 mm CW	1,514	Low	Declining	None		0–30% LM		973,000 MM crabs	15Jan –11Feb 06	*	GHL 181
South AK Pen TC	Pot	ASA	MM > 114 mm CW	2,932	Low	Stable	None		0–30% LM		3,265,000 MM	15 Jan –11 Feb 06	*	GHL 136
Eastern Aleutian Islands TC	Pot	ASA	MMA >114 mm CW	86 mt of legal male biomass in the area open in '05.	Low	Stable	0.3	None	20% of the new shell legal male abundance.		50% of long-term mature male abundance.	15Jan–31 Mar 06	*	GHL 39.6 Each bay is treated as a separate fishery.
W Aleutian Is. GKC	Pot	FPA	LM > 140 mm CW	No est.	Aver.	Stable	0.2		0–20% LM	18% LM	None	15Aug.'05–15 May '06	*	TAC 1,361
Peninsula DC	Pot	FPA	LM > 165 mm CW	No Est.	UK	UK	None		3S	3S	None	May1–Jan1	*	None (3S)
Aleutian Islands SKC	Pot	FPA	Males >140 mm CW	No Est.	Small, UK	UK	0.2		None	None	None	1 Jan–31 Dec by permit	*	Bycatch in the GKC fishery

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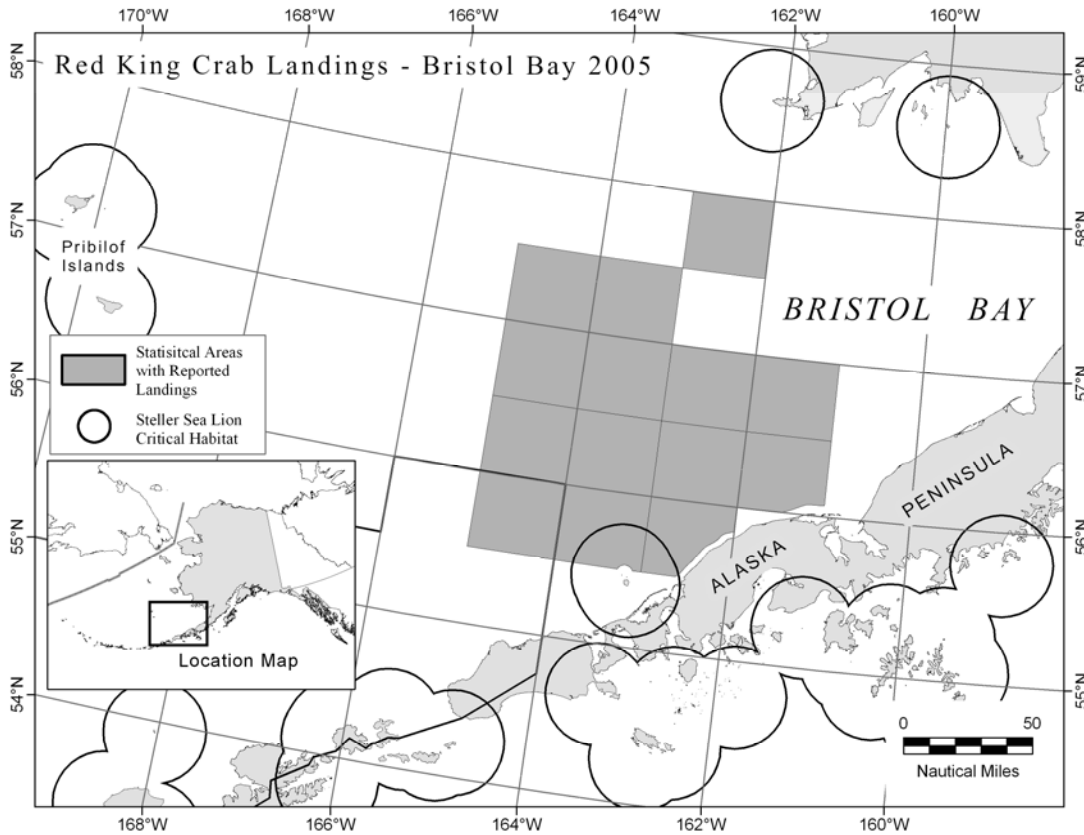
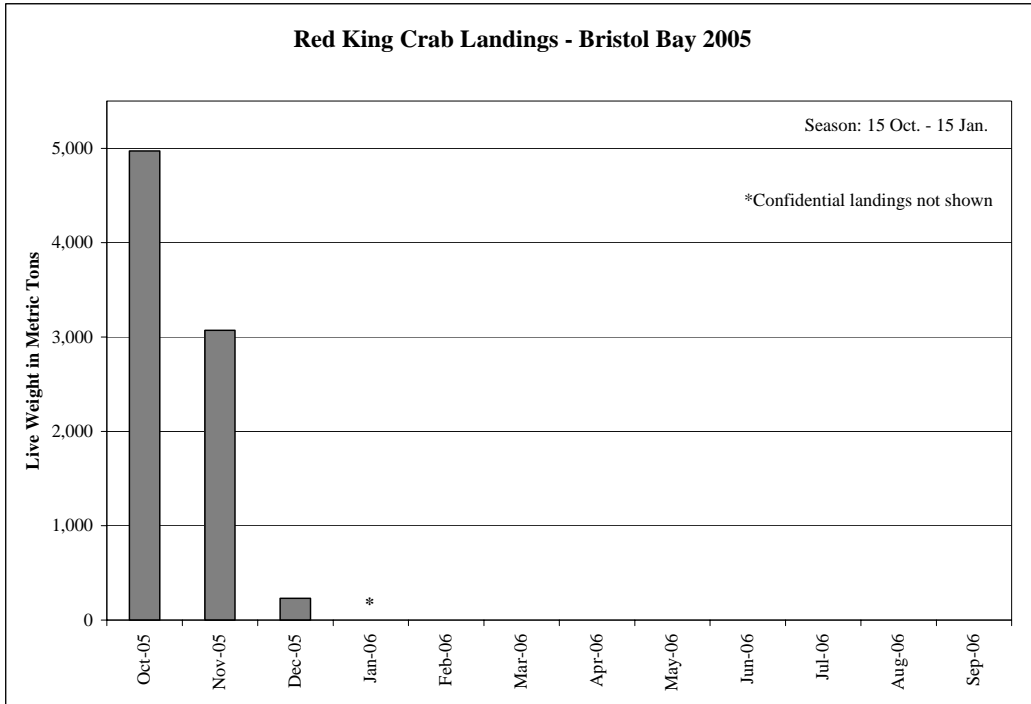
Table 3.4–Page 2 of 2.

Fishery	Gear	Assessment Method	Stock Definition	Stock Biomass (mt)	Stock Status Level	Stock Status Trend	Federal Overfishing Definition		Harvest Rate Policy	State Fishery Threshold (mt/no)	Season	Catch (mt)	Remarks (GHL or GHR in mt)
							F <sub>MSY</sub>	Biomass MSST (mt)	Framework 2005				
<b>Other Invertebrates:</b>													
Lower Cook Inlet Scallop	Dredge	ASA	“population meat”	134	Low	Stable (north) Decline (south)	None	None	0–10%	None	Aug15–31	*	GHL: 3.2 mt shucked meat, 0.5 or 1% Tanner and king crab bycatch cap
Cook Inlet Littleneck Clam	Rake	ASA	Legal Size > 38 mm SL	Estimates for some areas	UK	Variable	None	None	Variable: 2.5–5% of the lower 95% ci based upon subdistrict trends in both biomass and harvest cpue	None	Temperature dependent openings during Nov 1–March 15; no weekend harvest during May 15–Sept 15.	*	GHL: 8.1
Shrimp (Northern & Sidestriped) (Dutch Harbor, PWS, Adak & W Aleutian Is., Pribilof Is., Kodiak, St. Matthew Is.)	Otter Trawl, Beam Trawl, Pot	ASA& FPA	Undefined	No Est. for all regions	Low	Stable	None			Various MABI for different areas	Various time periods (e.g., trawl: Apr 15–Aug15, Oct 1–Dec 31 in PWS)	*	GHL: in PWS: 0–23 for each season, spring and fall, 10% cap on northern and pandalid shrimp
Kodiak Red Sea Cucumber	Diving	CPUE	Undefined	No Est.	UK	Stable	None		Permit		Oct 1–Apr 30	*	GHL: 66

LS: legal size; F<sub>MSY</sub>: Maximum fishing mortality threshold; MSST: minimum stock size threshold; Harvest Rate: percentage of the estimated legal male biomass; ASA: area swept analysis; CPUE: catch per unit effort; PWS: Prince William Sound; UK: unknown; GHR: guideline harvest rate; No Est.: no estimation; Aver.: average level.

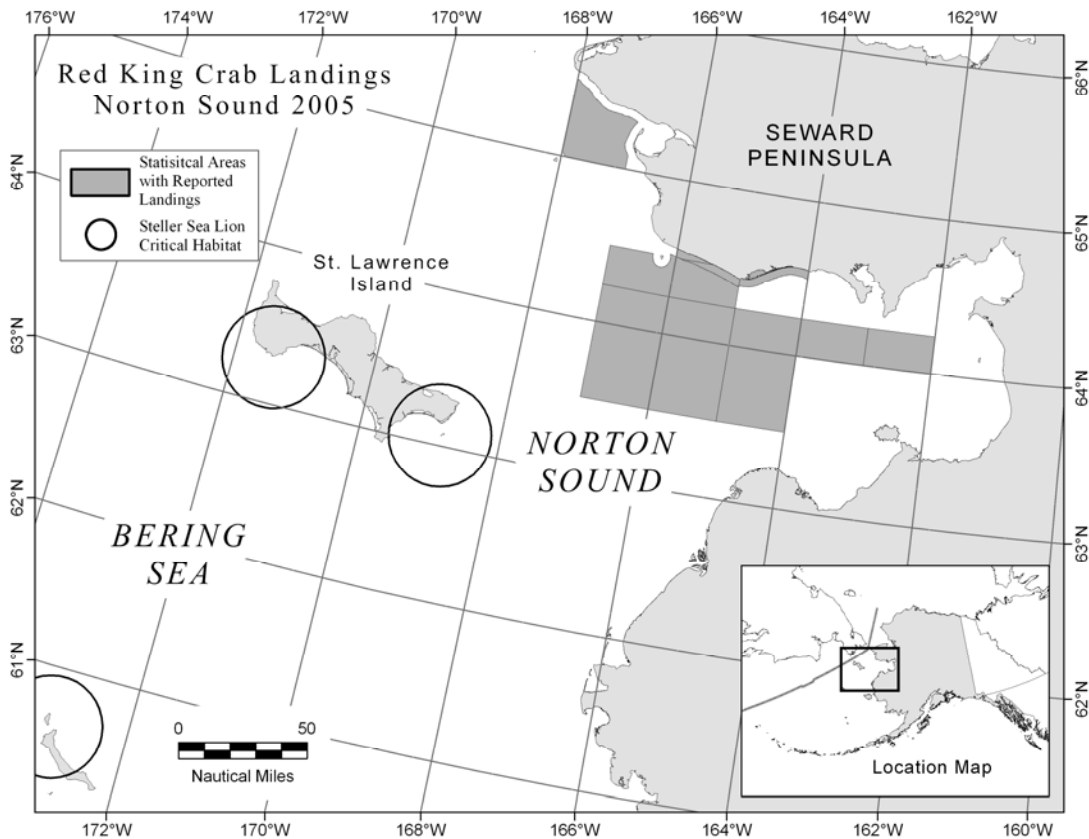
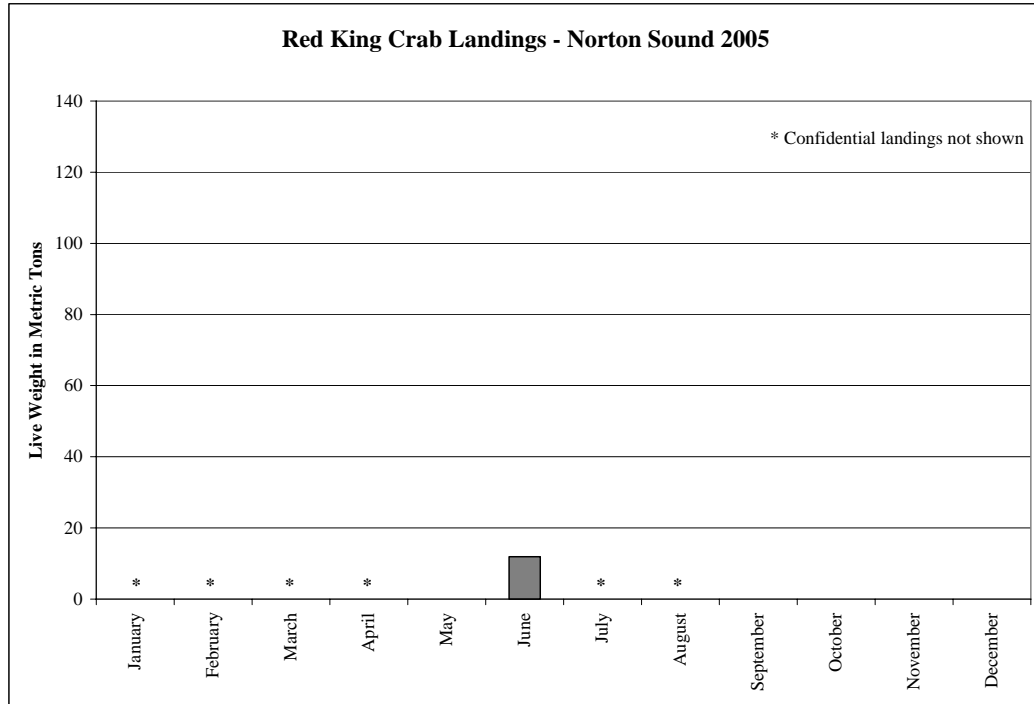


**Figure 3.1 (Historical Figure 6.1).**—Historical red king crab, *Paralithodes camtschaticus*, landings (in 1000 mt) in the Cook Inlet, Kodiak, Aleutian Islands, and Bristol Bay management areas. Cook Inlet, Kodiak, and Aleutian Islands landings are given per season (for example, 1960 refers to the 1960/1961 season).

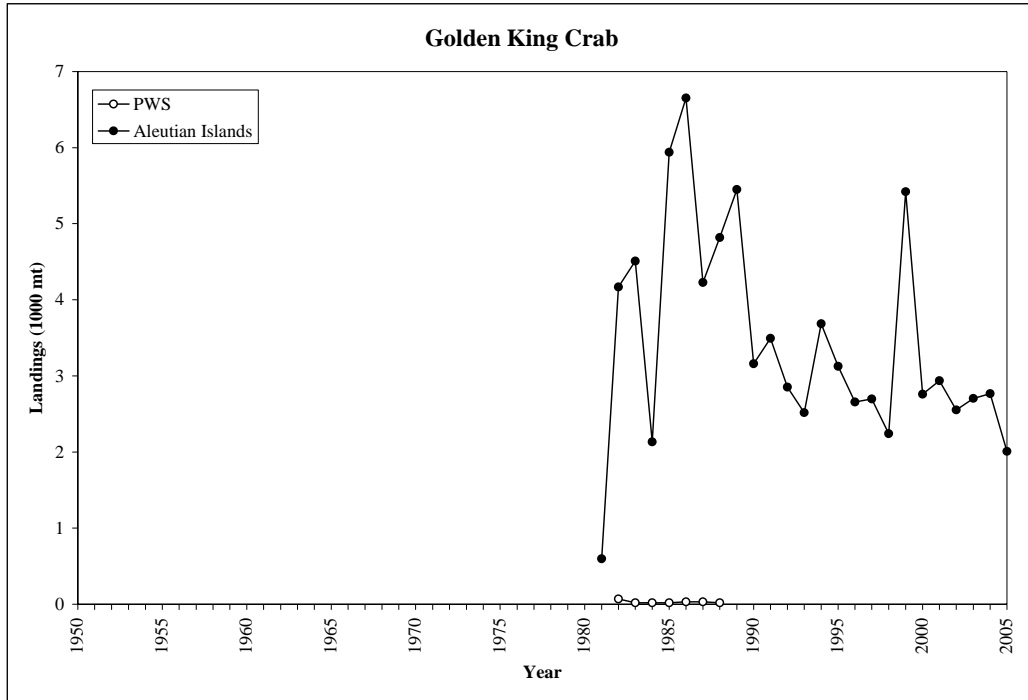


**Figure 3.2 (Historical Figure 6.11).**—Monthly distribution of red king crab landings in the Bristol Bay management area, 2005 (top), and spatial distribution of red king crab landings in the Bristol Bay management area, 2005 (bottom). \* indicates confidential landings.

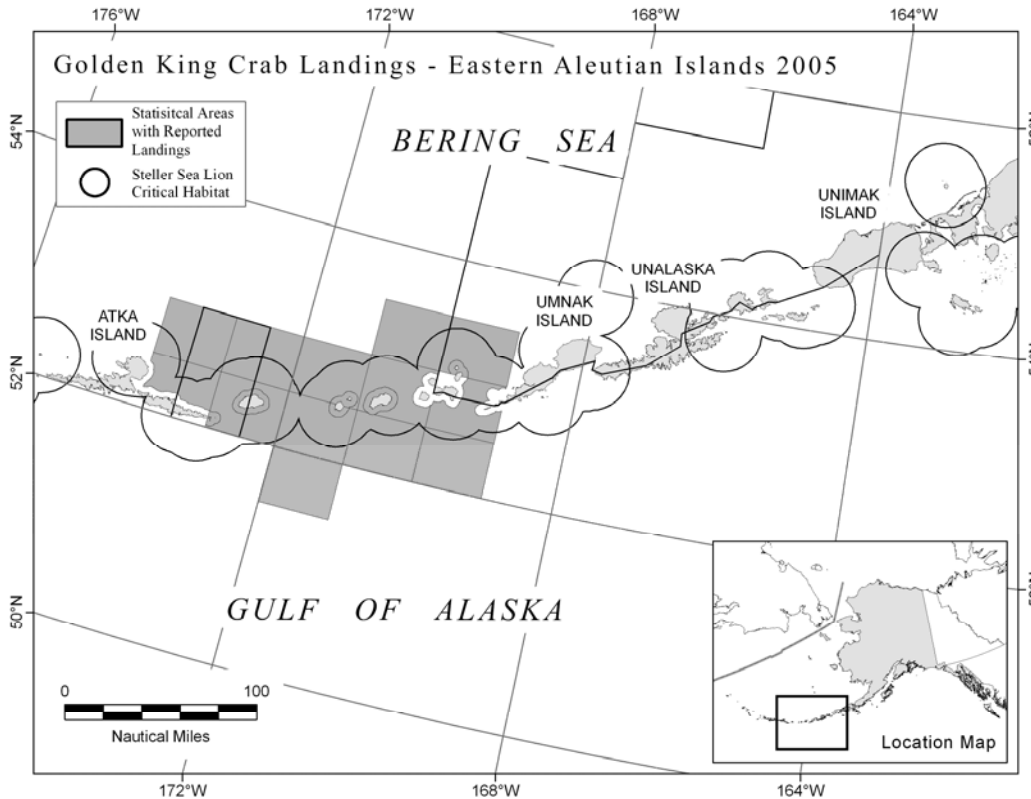
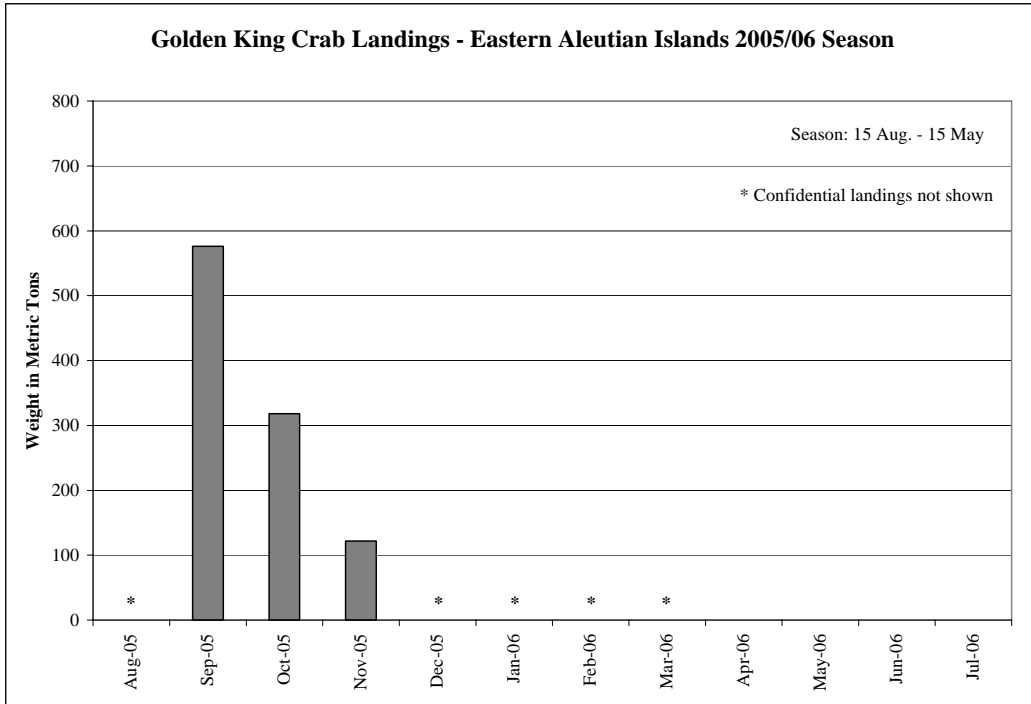




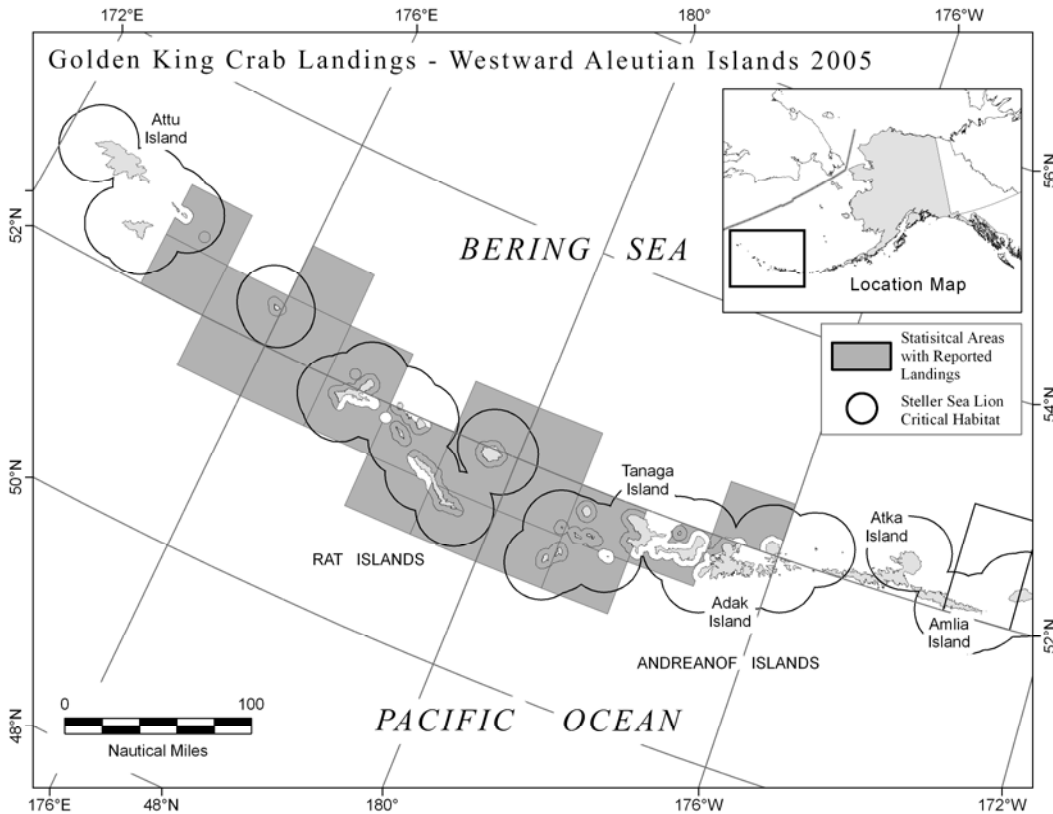
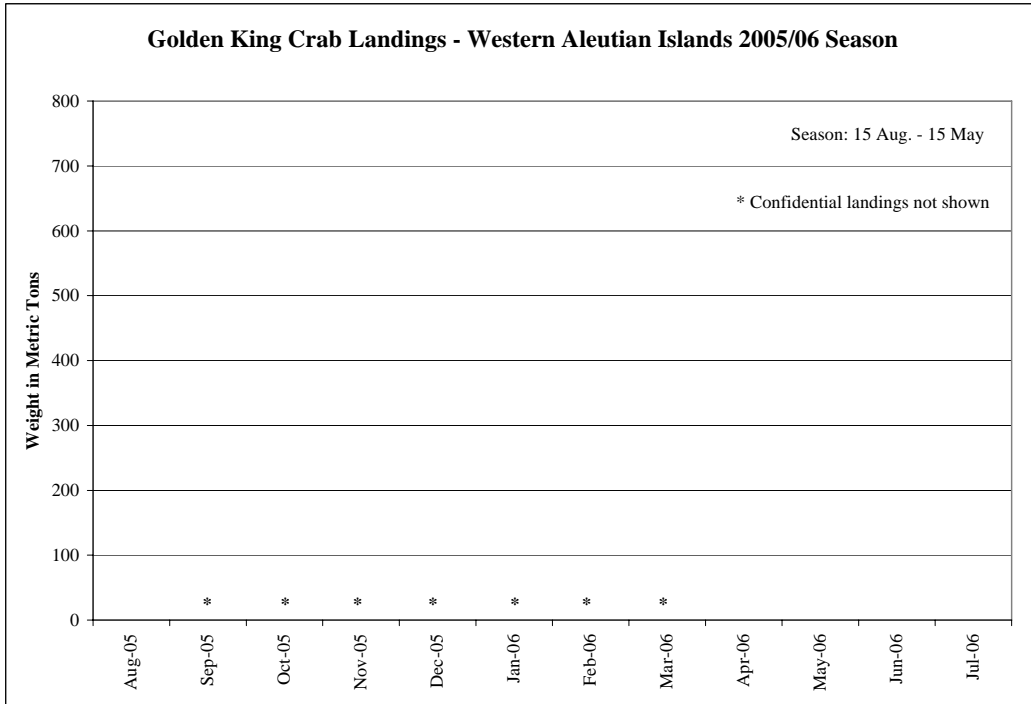
**Figure 3.3 (Historical Figure 6.12).**—Monthly distribution of red king crab landings in the Norton Sound management area, 2005 (top), and spatial distribution of red king crab landings in the Norton Sound management area, 2005 (bottom). Note the change in y-axis scale: 0–10 mt in 1999, 0–120 mt in 2005. \* indicates confidential landings.



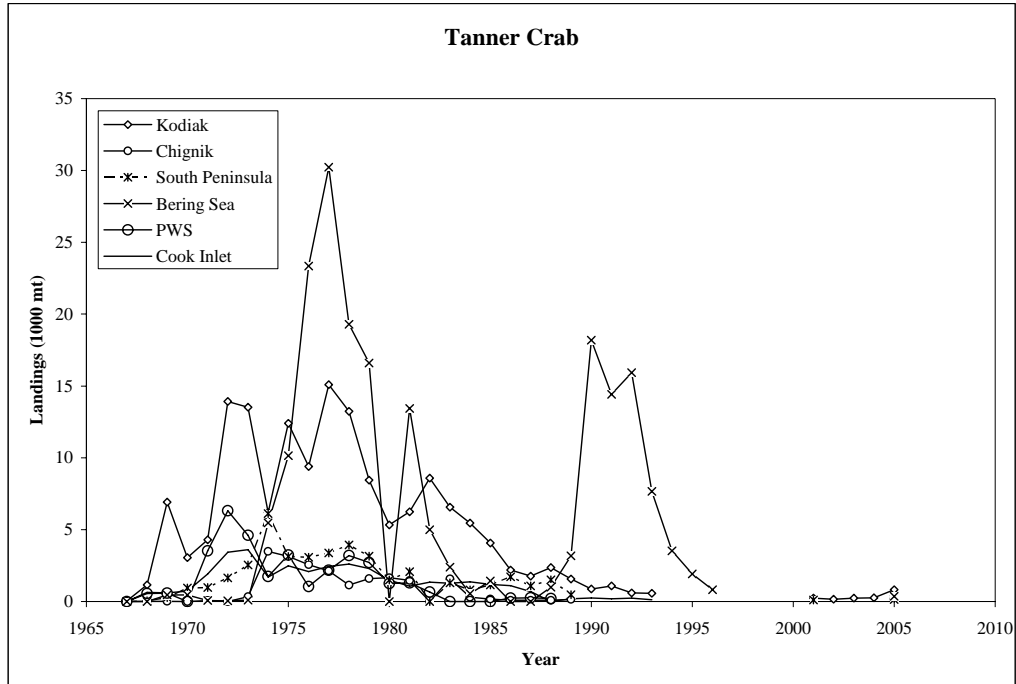
**Figure 3.4 (Historical Figure 6.3).**—Historical seasonal golden king crab landings (in 1000 mt) in the Prince William Sound and the Aleutian Islands management areas. Landings are given per season (for example, 1981 refers to the 1981/1982 season).



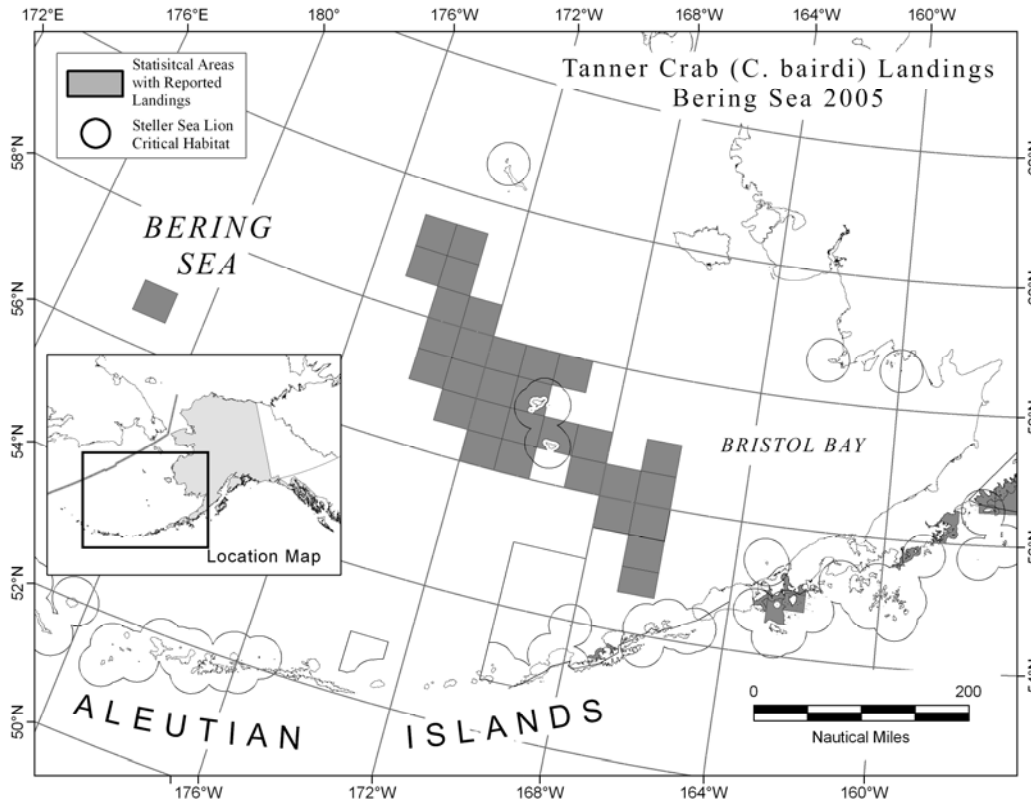
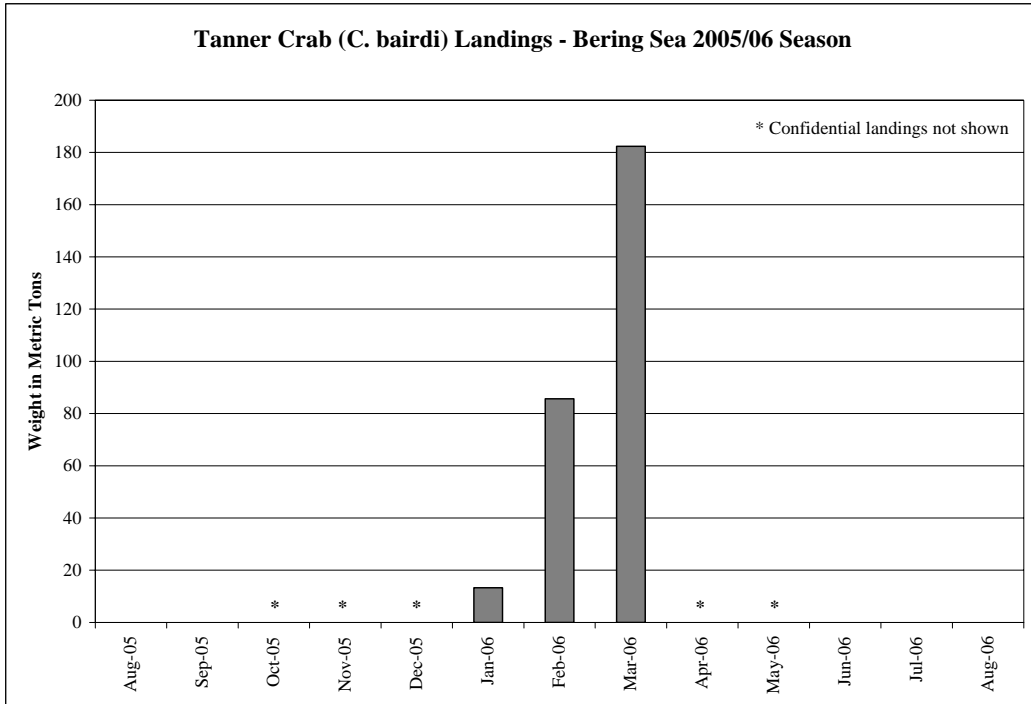
**Figure 3.5 (Historical Figure 6.13).**—Monthly distribution of golden king crab landings in the eastern Aleutian Islands management area, 2005 (top), and spatial distribution of golden king crab landings in the eastern Aleutian Islands management area, 2005 (bottom). \* indicates confidential landings.



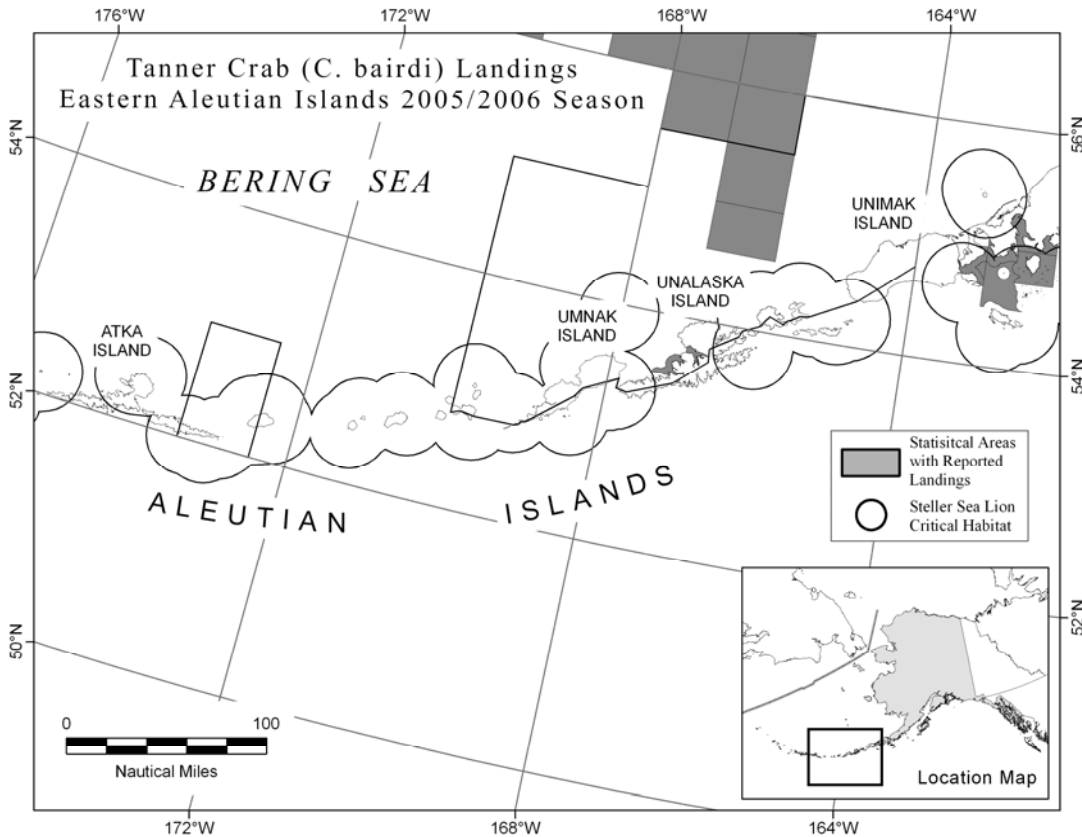
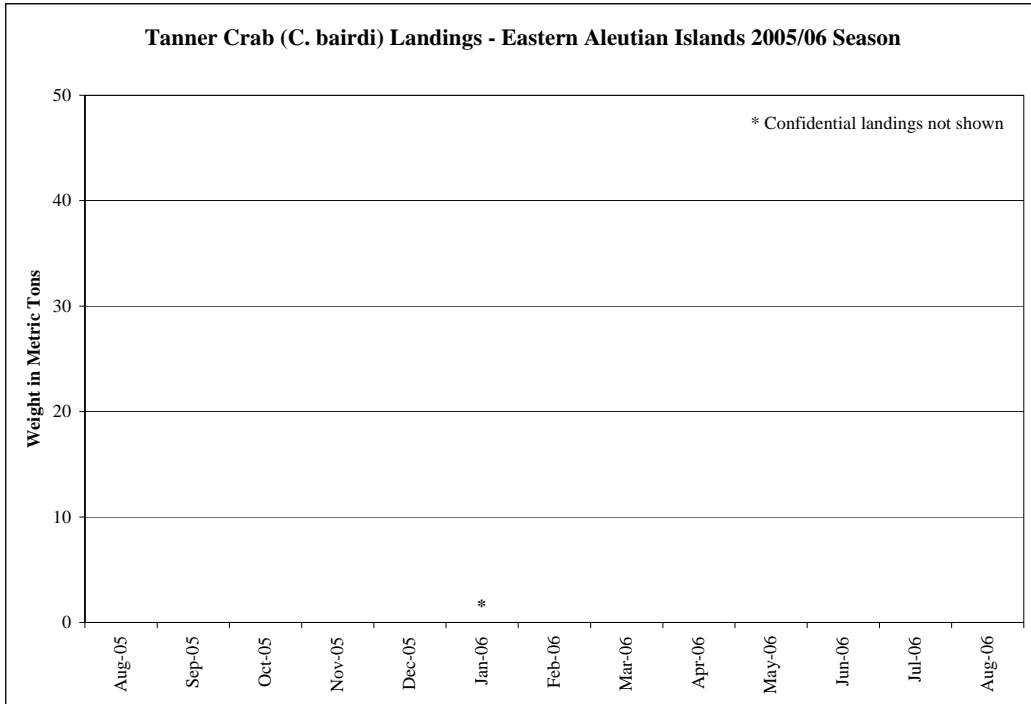
**Figure 3.6 (Historical Figure 6.14).**—Monthly distribution of golden king crab landings in the western Aleutian Islands, 2005 (top), and spatial distribution of golden king crab landings in the western Aleutian Islands (bottom). \* indicates confidential landings.



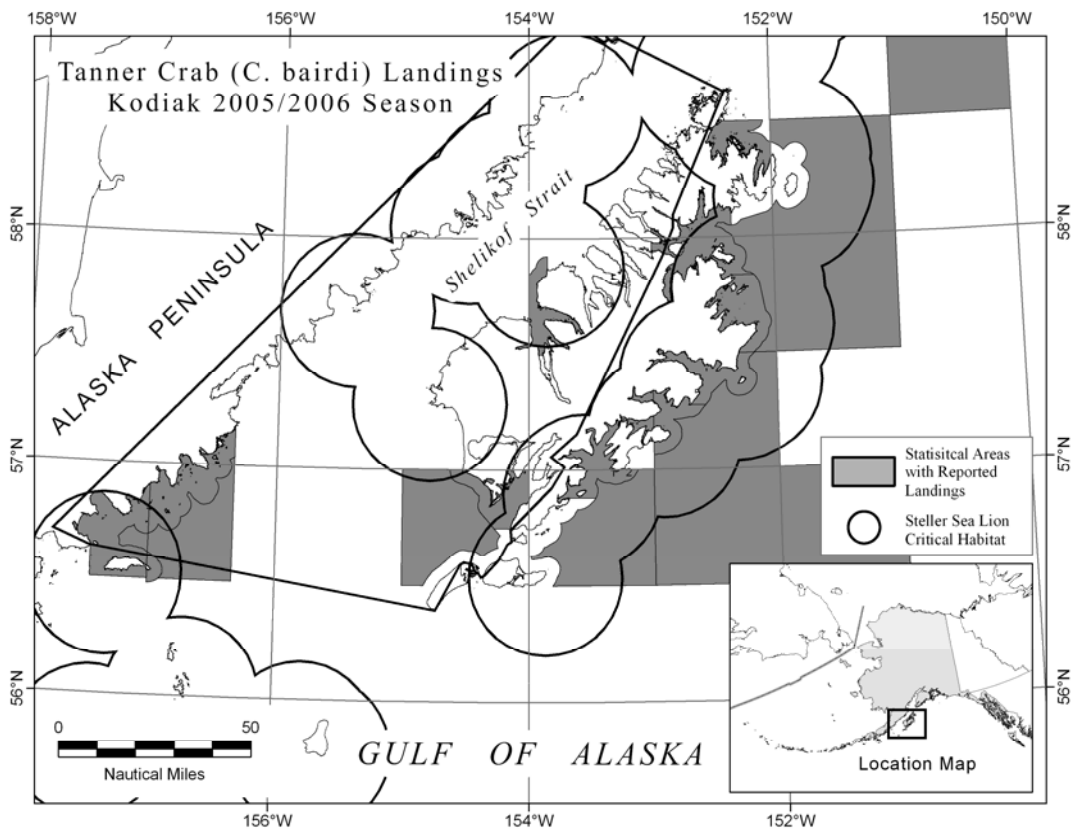
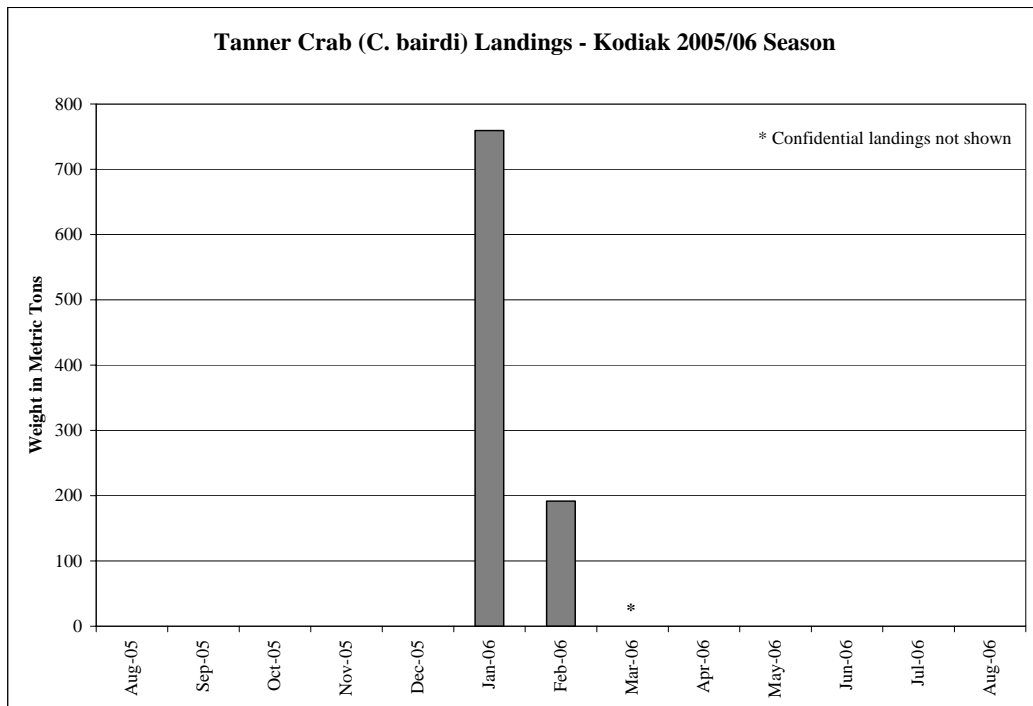
**Figure 3.7 (Historical Figure 6.4).**—Historical Tanner crab, *Chionoecetes bairidi*, landings (in 1000 mt) in the Prince William Sound, Cook Inlet, Kodiak, Chignik, Southern Alaska Peninsula, and Bering Sea management areas. Some landings are given per season (spanning two calendar years), whereas others are given per calendar year.



**Figure 3.8.**—Monthly distribution of Tanner crab (*C. bairdi*) landings in the Bering Sea management area, 2005/2006 season (top), and spatial distribution of Tanner crab (*C. bairdi*) landings in the Bering Sea management area, 2005/2006 season (bottom). \* indicates confidential catch.

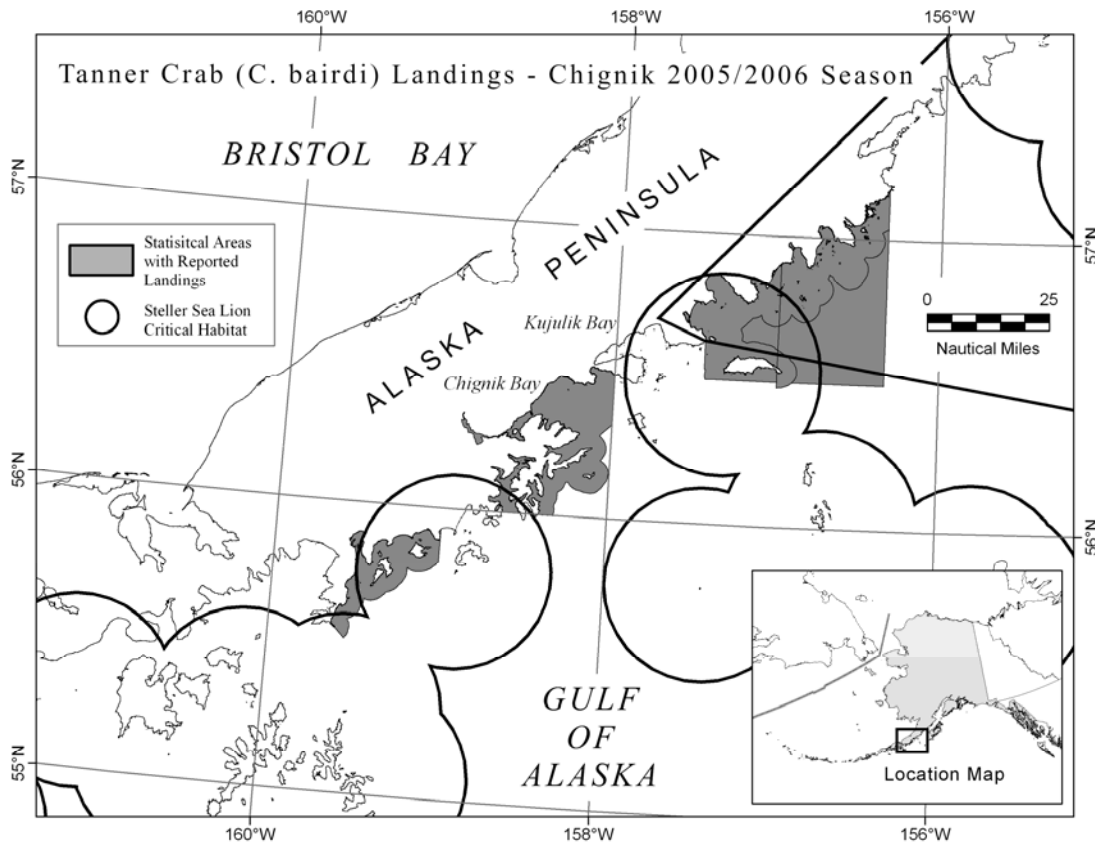
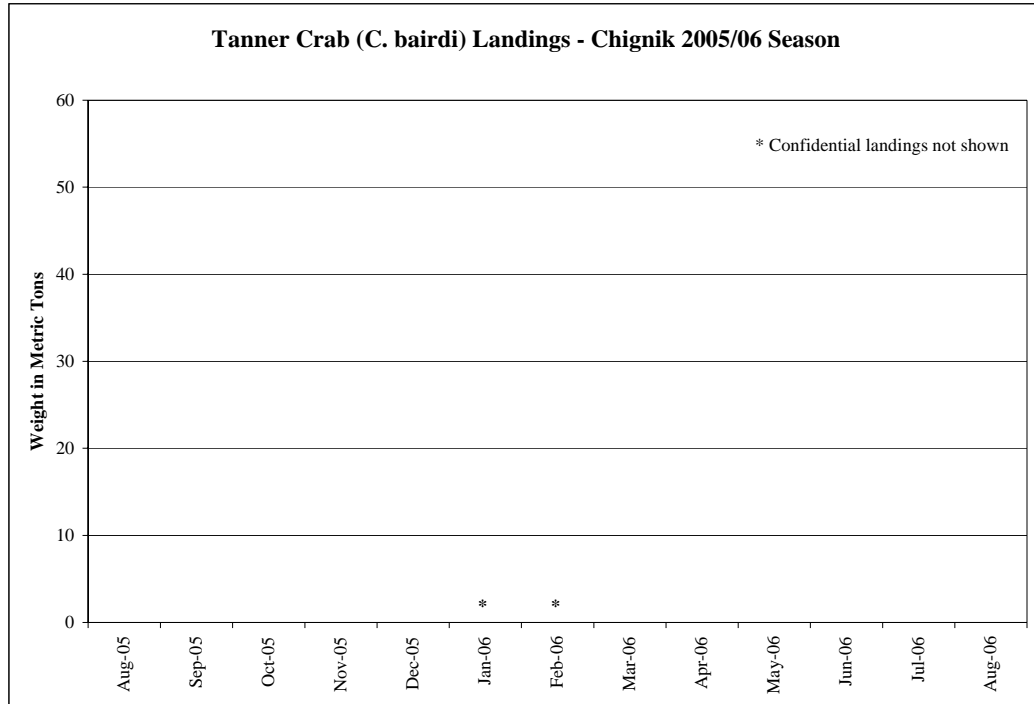


**Figure 3.9.**—Monthly distribution of Tanner crab (*C. bairdi*) landings in the Eastern Aleutian Islands management area, 2005/2006 season (top), and spatial distribution of Tanner crab (*C. bairdi*) landings in the Eastern Aleutian Islands management area, 2005/2006 season (bottom). \* indicates confidential catch.

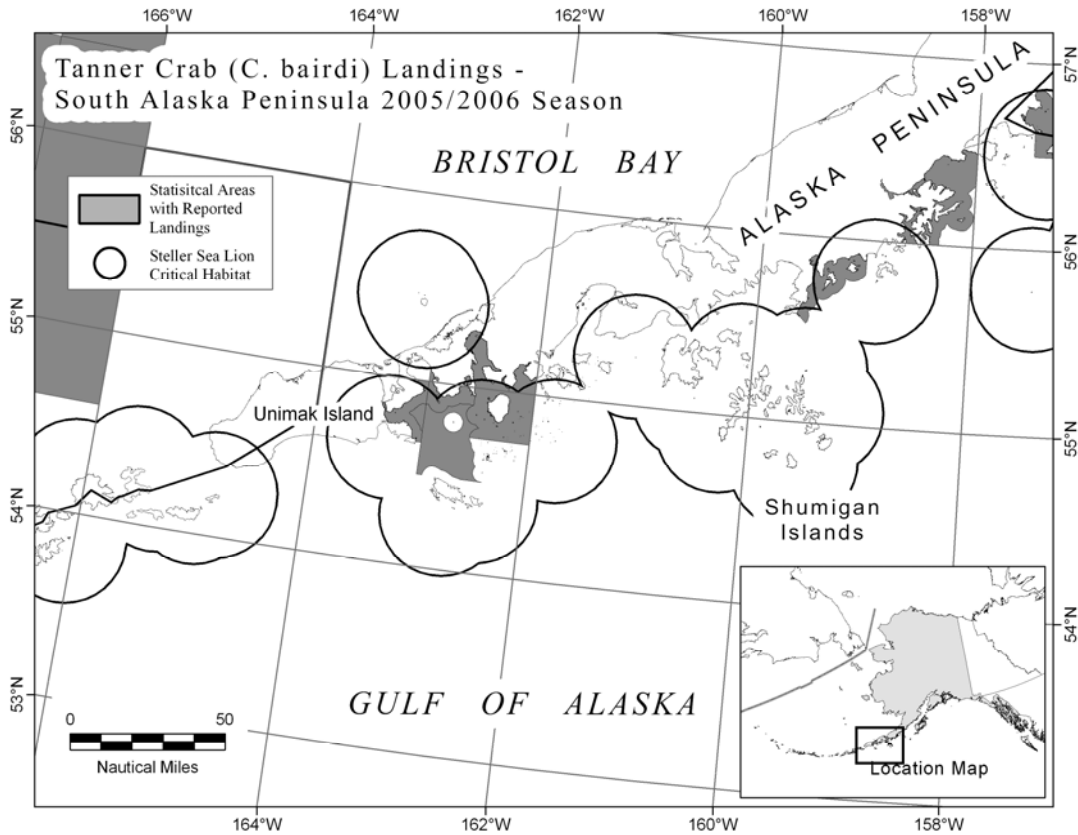
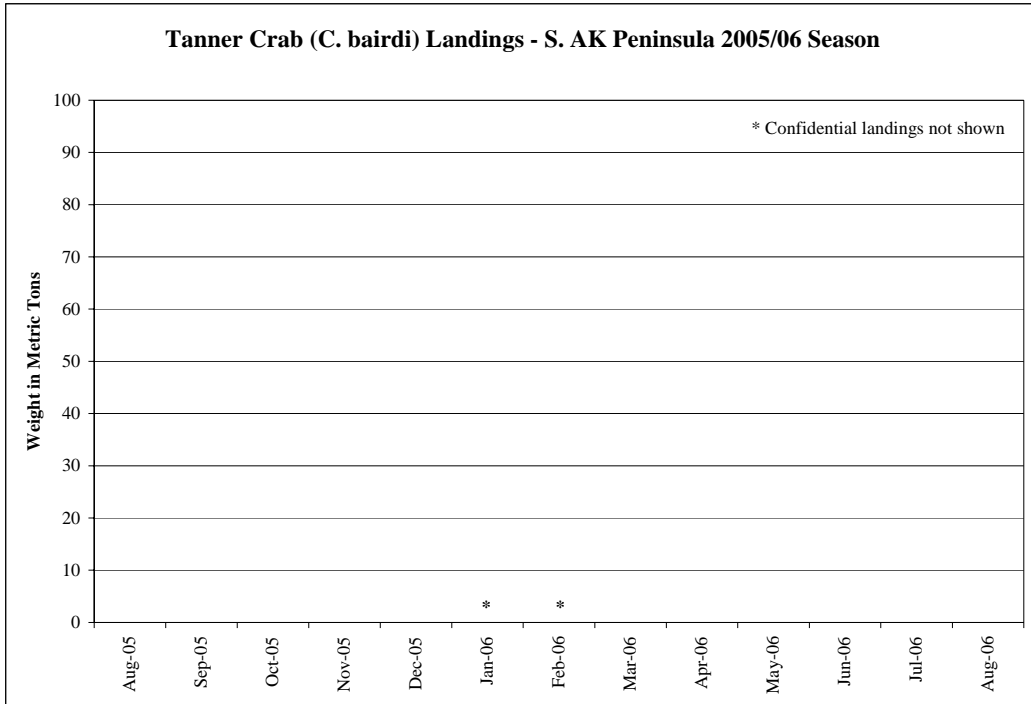


**Figure 3.10.** –Monthly distribution of Tanner crab (*C. bairdi*) landings in the Kodiak management area, 2005/2006 season (top), and spatial distribution of Tanner crab (*C. bairdi*) landings in the Kodiak management area, 2005/2006 season (bottom). \* indicates confidential catch.

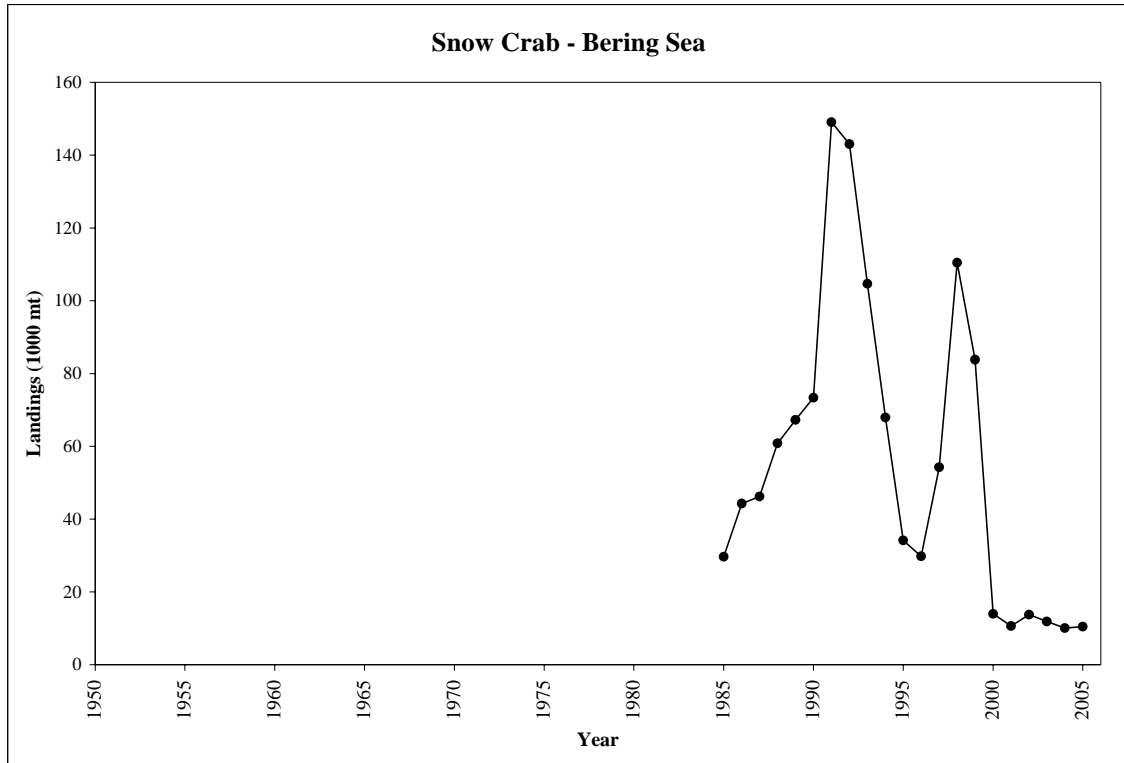




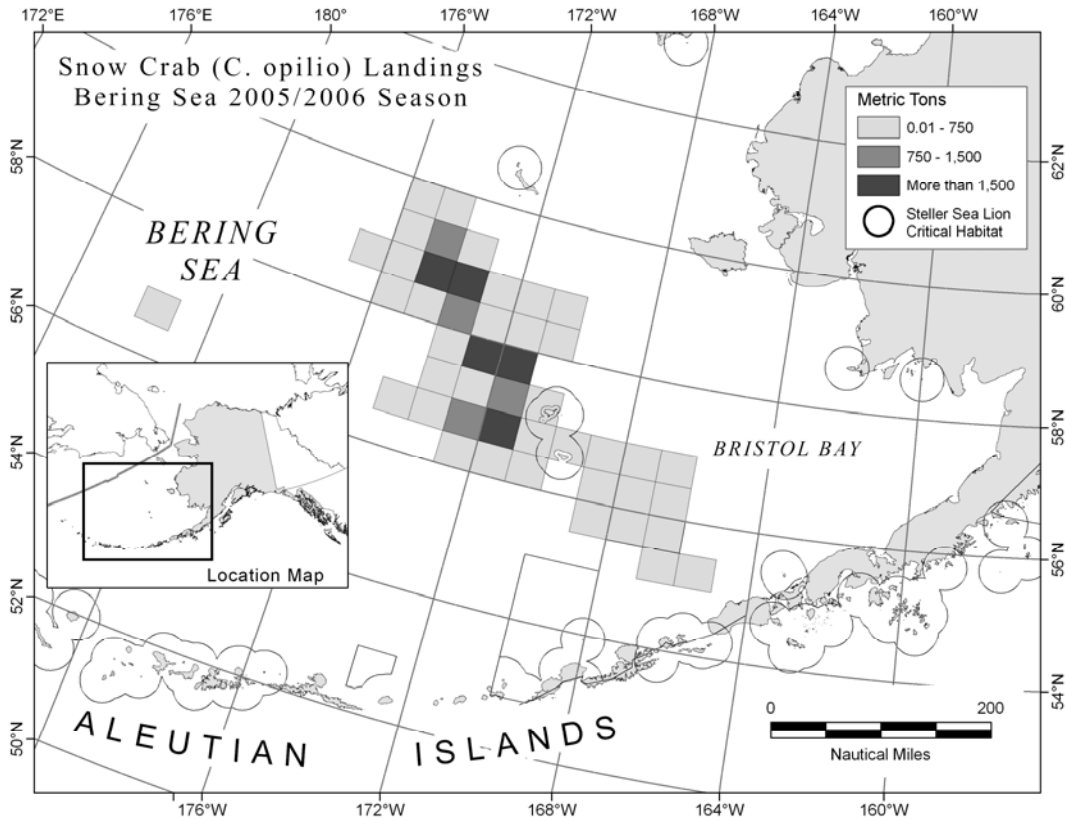
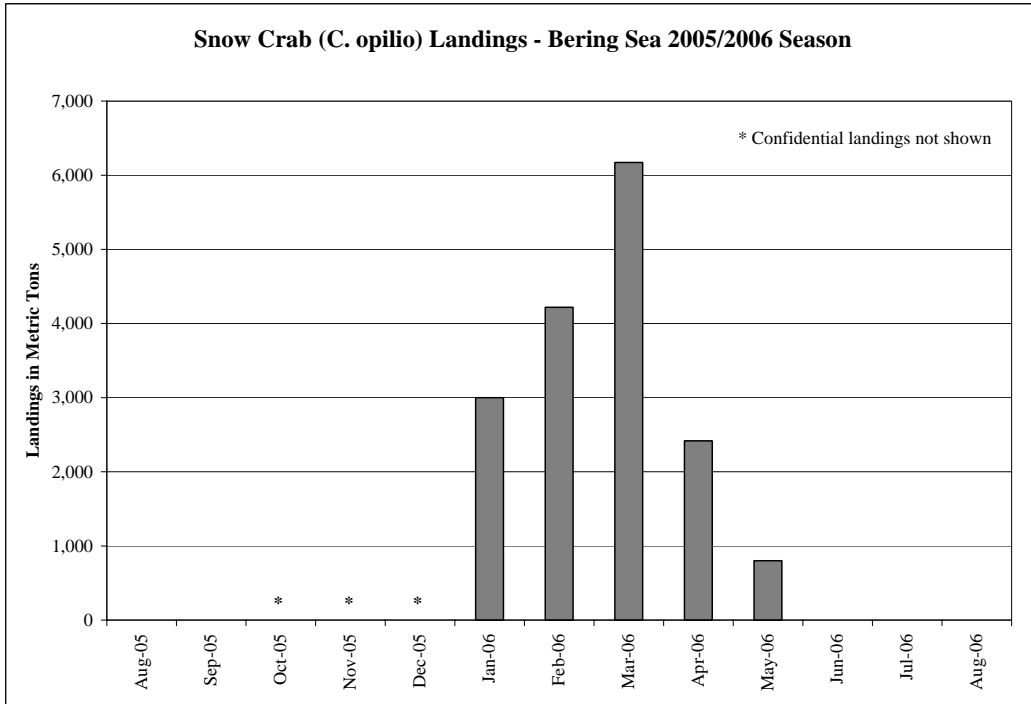
**Figure 3.11.**—Monthly distribution of Tanner crab (*C. bairdi*) landings in the Chignik management area, 2005/2006 season (top), and spatial distribution of Tanner crab (*C. bairdi*) landings in the Chignik management area, 2005/2006 season (bottom). \* indicates confidential catch.



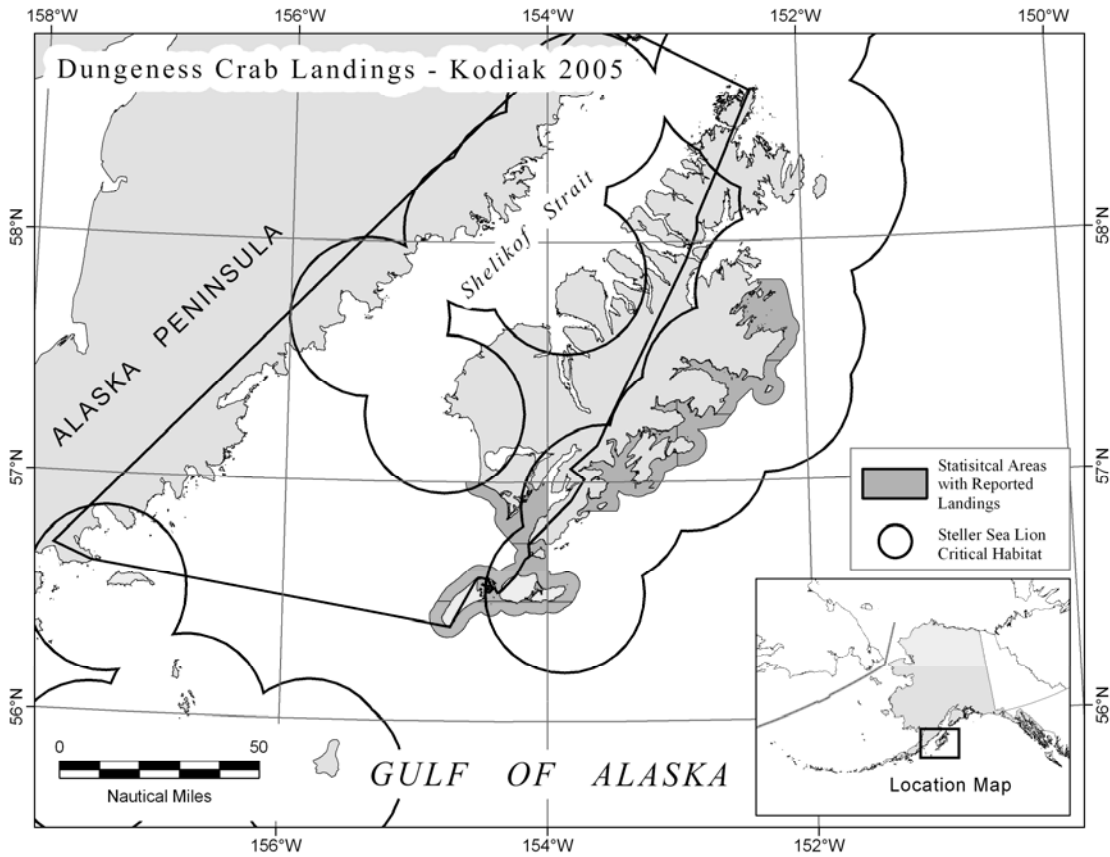
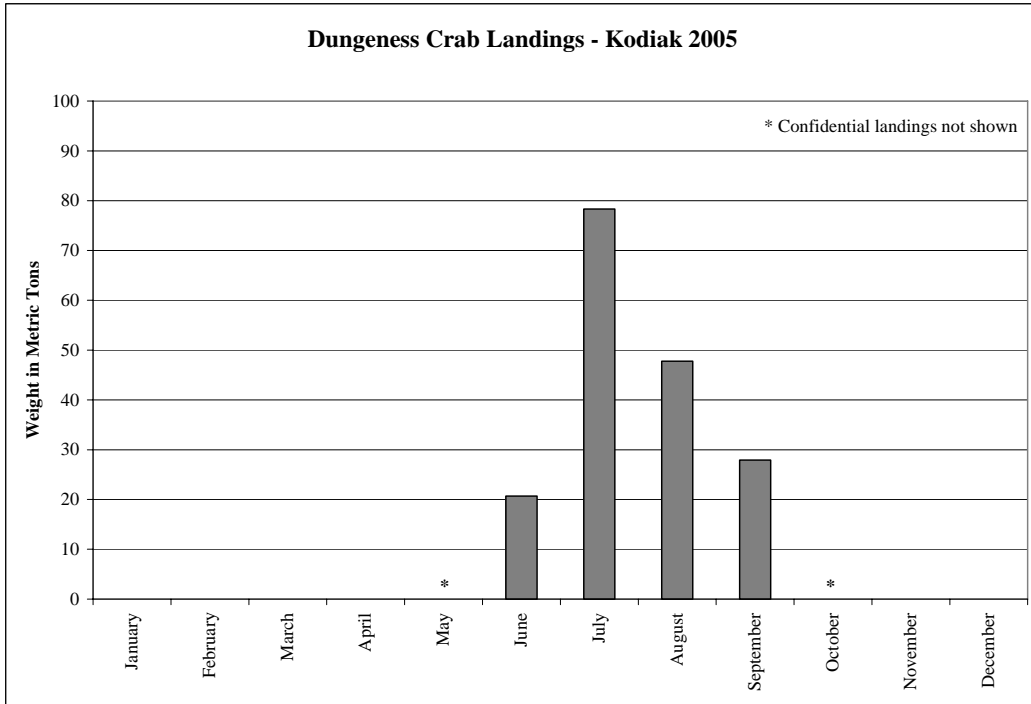
**Figure 3.12.**—Monthly distribution of Tanner crab (*C. bairdi*) landings in the S. Alaska Peninsula management area, 2005/2006 season (top), and spatial distribution of Tanner crab (*C. bairdi*) landings in the S. Alaska Peninsula management area, 2005/2006 season (bottom). \* indicates confidential catch.



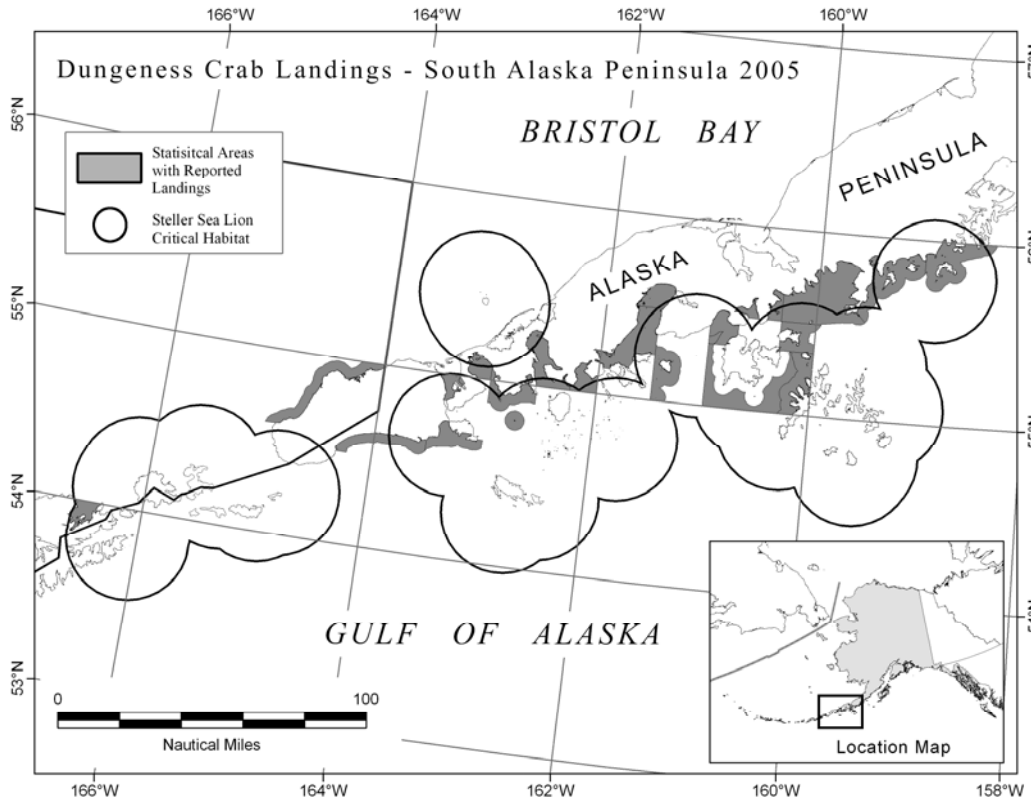
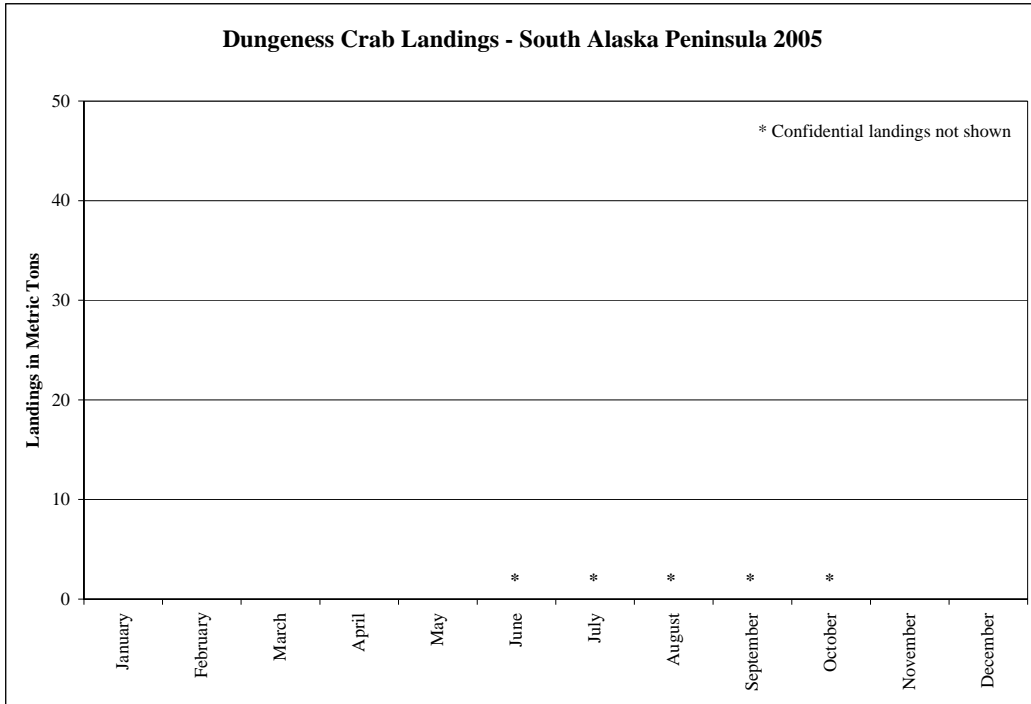
**Figure 3.13 (Historical Figure 6.5).**—Historical snow crab landings (in 1000 mt) in the Bering Sea management area. Some landings are given per season (spanning two calendar years), whereas others are given per calendar year.



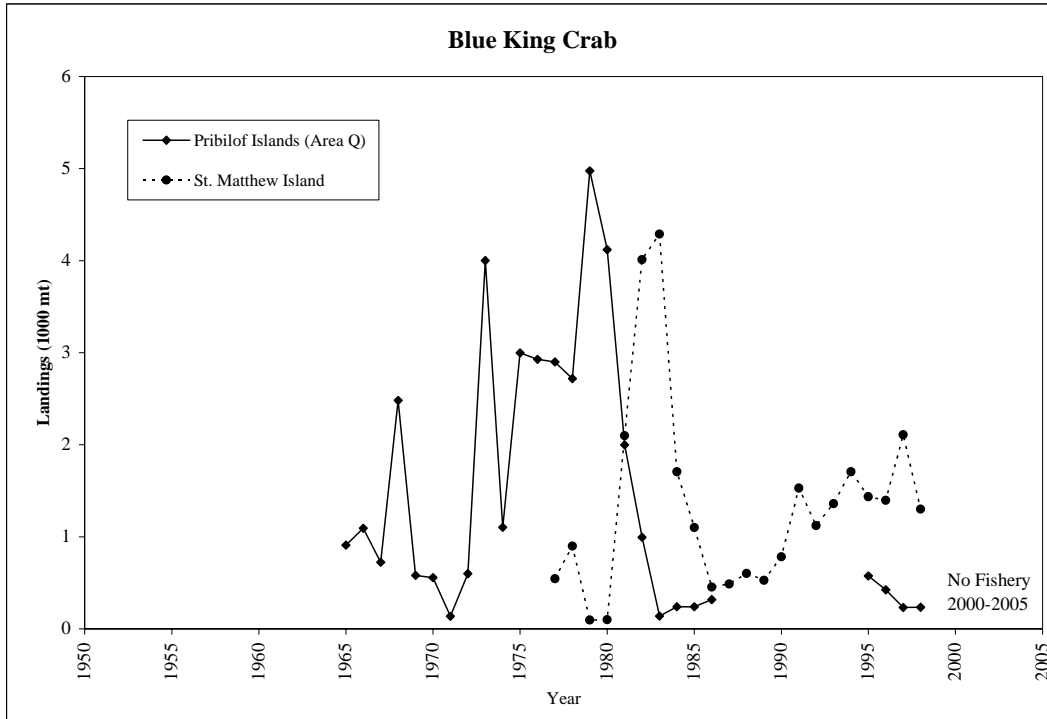
**Figure 3.14 (Historical Figure 6.15).**—Monthly distribution of snow crab landings in the Bering Sea management area, 2005/2006 season (top), and spatial distribution of snow crab landings in the Bering Sea management area, 2005/2006 season (bottom). Note the change in y-axis scale: 0–50,000 mt in 1999, 0–7,000 mt in 2005. \* indicates confidential landings.



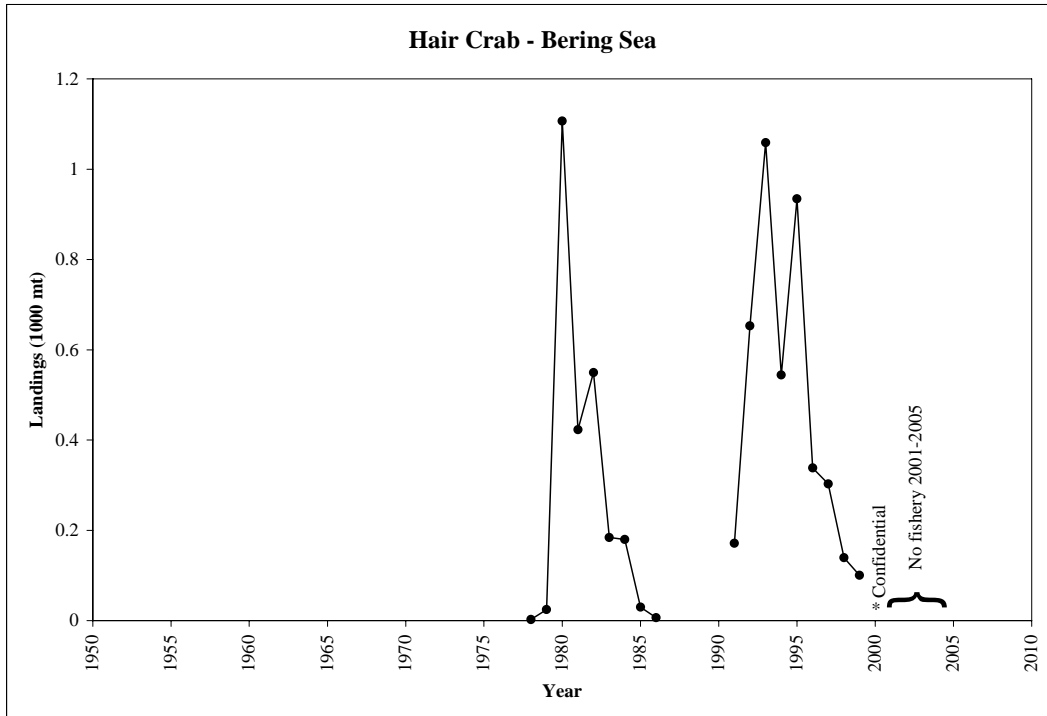
**Figure 3.15 (Historical Figure 6.17).**—Monthly distribution of Dungeness crab landings in the Kodiak management area, 2005 (top), and spatial distribution of Dungeness crab landings in the Kodiak management area, 2005 (bottom). \* indicates confidential landings.



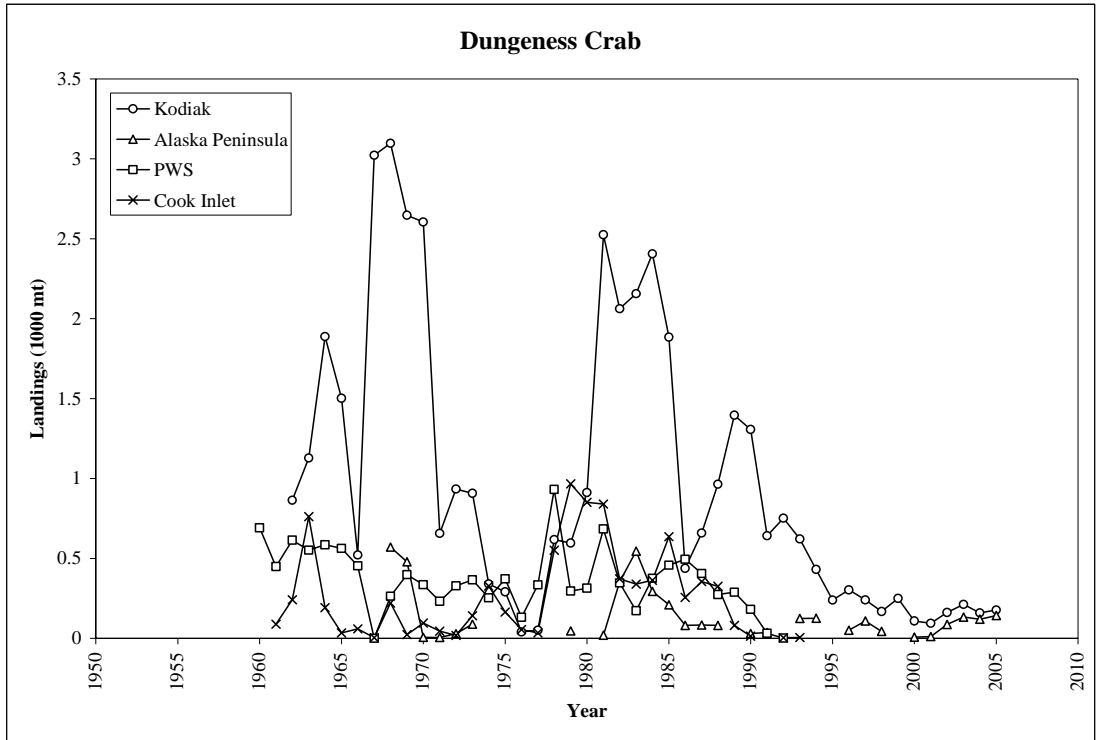
**Figure 3.16.**—Monthly distribution of Dungeness crab landings in the south Alaska Peninsula management area, 2005 (top), and spatial distribution of Dungeness crab landings in the south Alaska Peninsula management area, 2005 (bottom). The map also indicates areas where confidential harvest occurred in the Chignik and Bering Sea/Aleutian Islands Registration Areas. \* indicates confidential landings.



**Figure 3.17 (Historical Figure 6.2).**—Historical blue king crab landings (in 1000 mt) in the Pribilof Islands district and St. Matthew Island section. The Pribilof Islands landings are given per season (for example, 1972 refers to the 1972/1973 season).

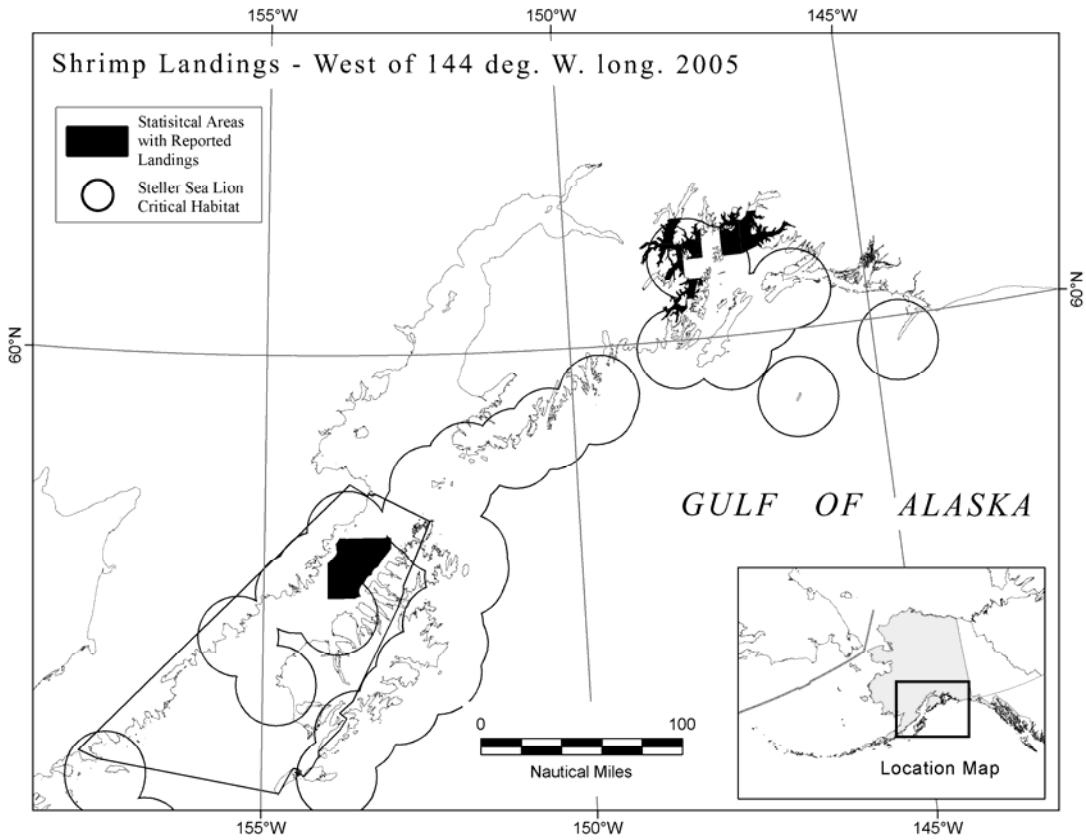
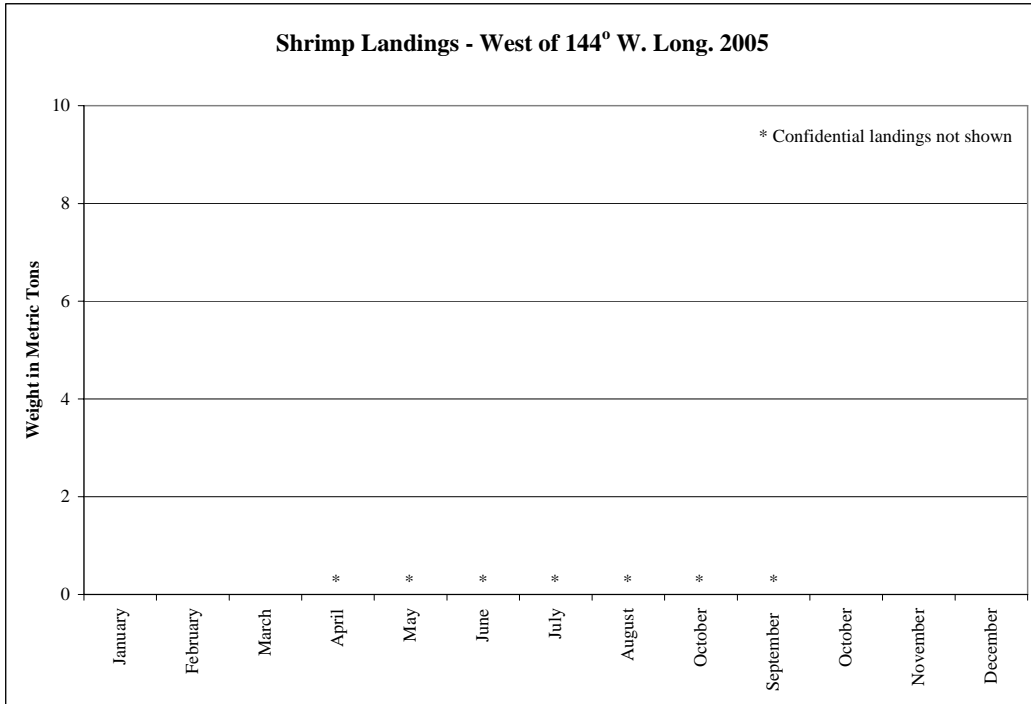


**Figure 3.18 (Historical Figure 6.6).**—Historical hair crab landings (in 1000 mt) in Bering Sea. Some landings are given per season (spanning two calendar years), whereas others are given per calendar year.

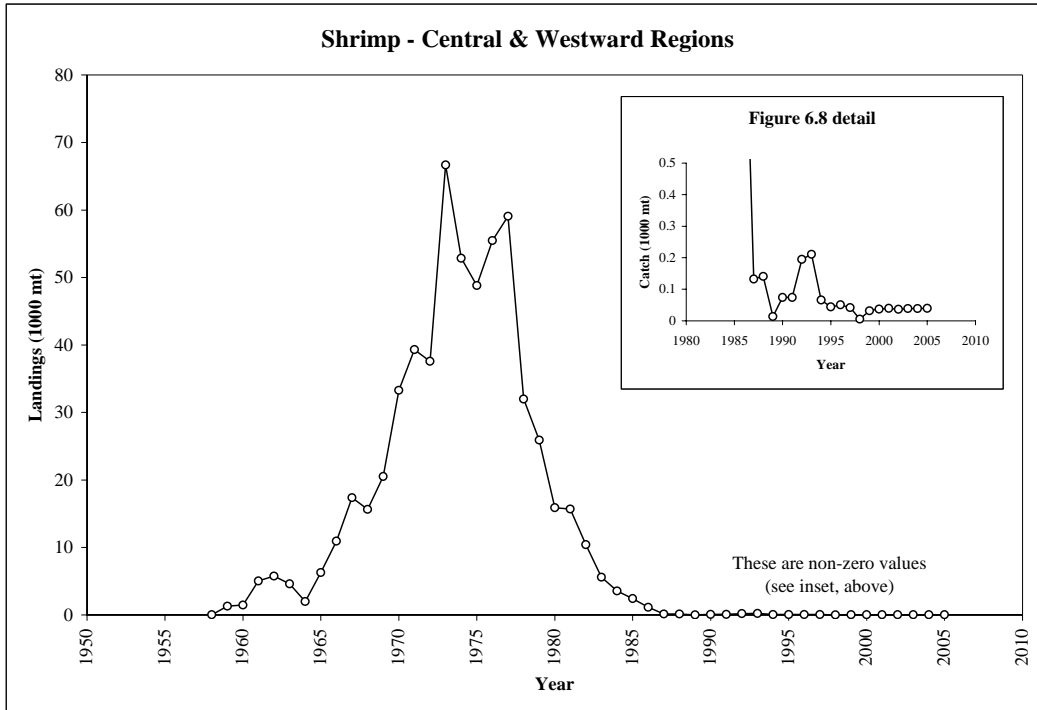


**Figure 3.19 (Historical Figure 6.7).**—Historical annual Dungeness crab landings (in 1000 mt) in the Prince William Sound, Cook Inlet, Kodiak, and Alaska Peninsula management areas.

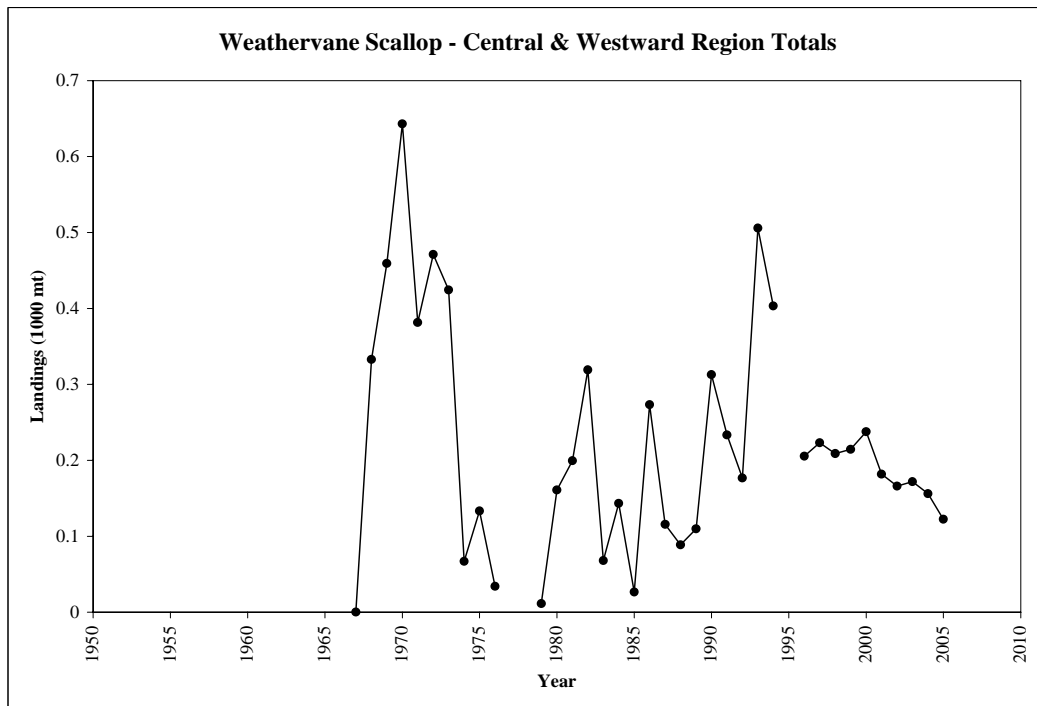




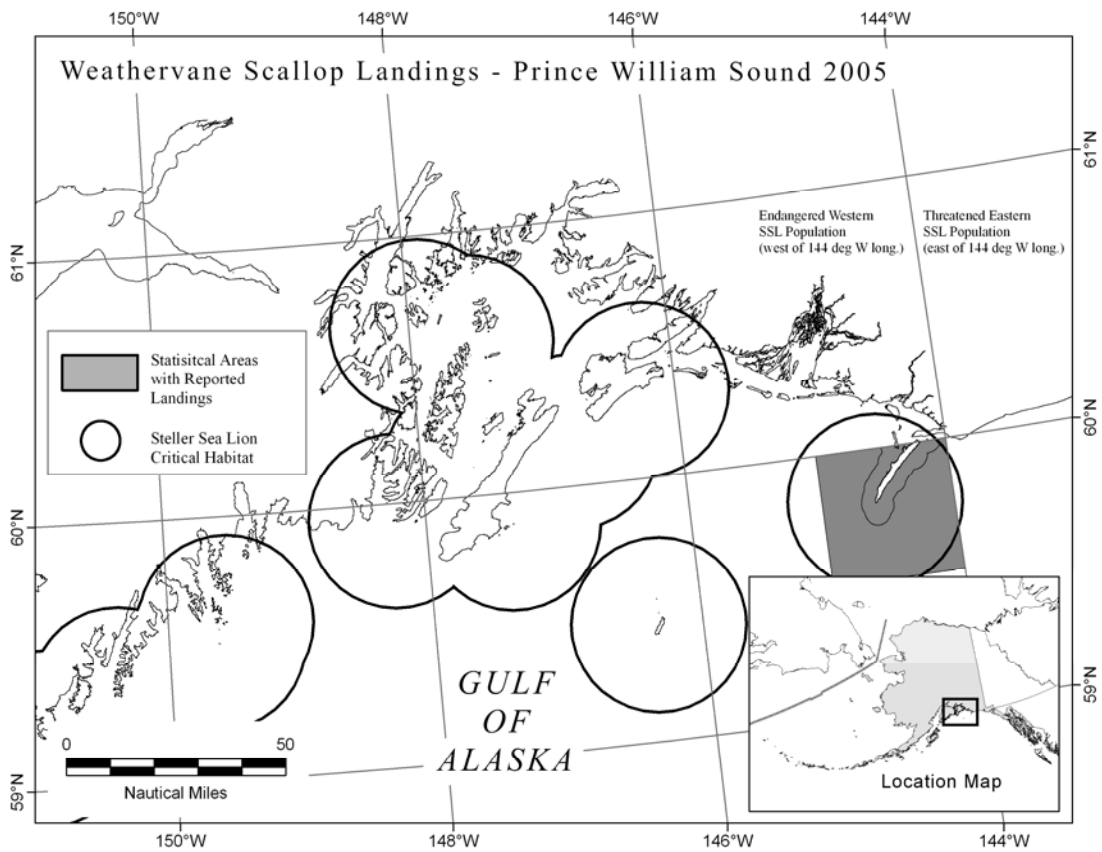
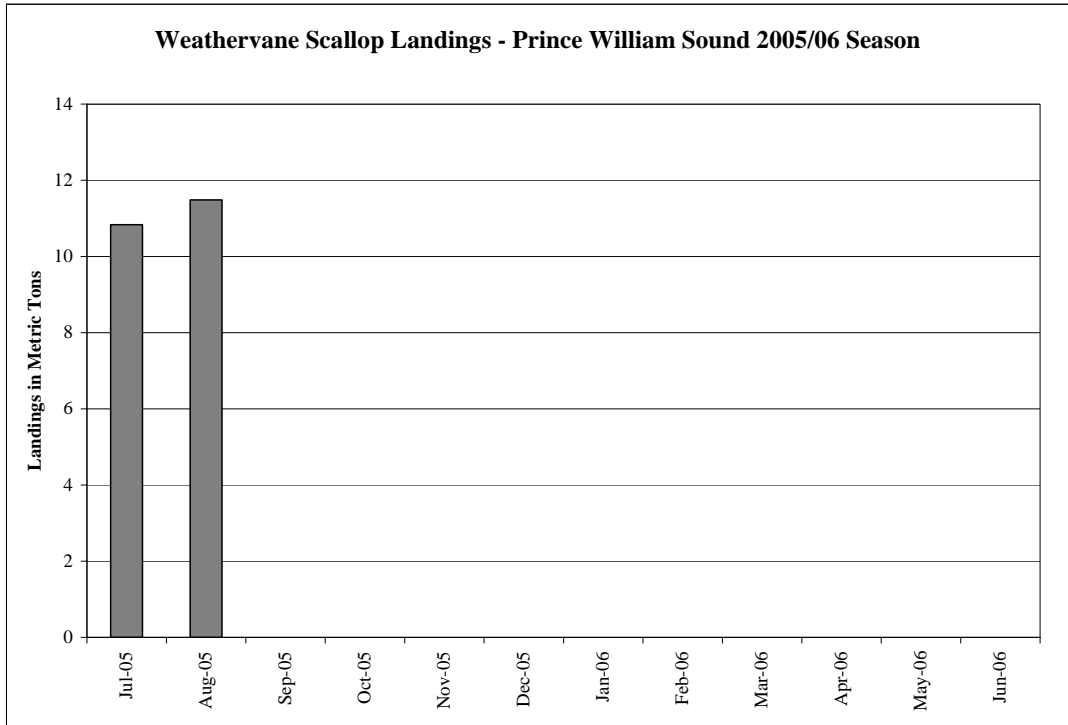
**Figure 3.20 (Historical Figure 6.18).**—Monthly distribution of shrimp landings west of 144° W. long., 2005 (top), and spatial distribution of shrimp landings west of 144° W. long., 2005 (bottom). \* indicates confidential landings.



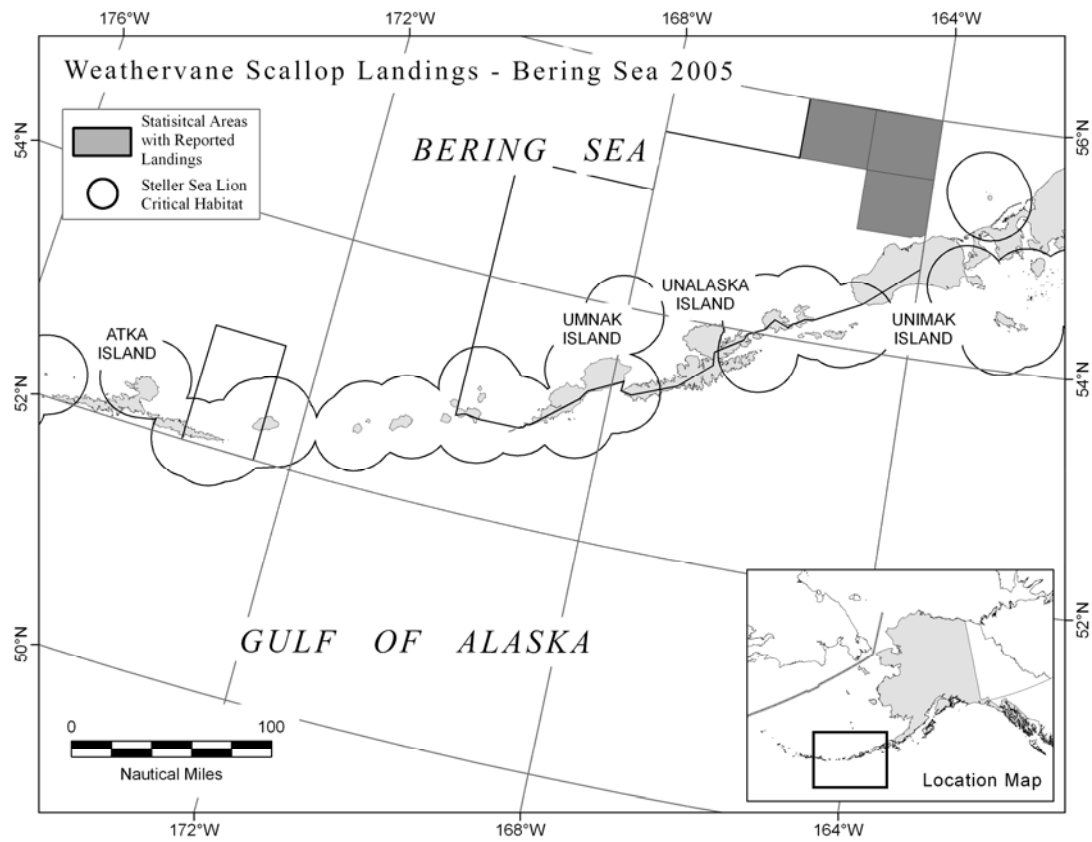
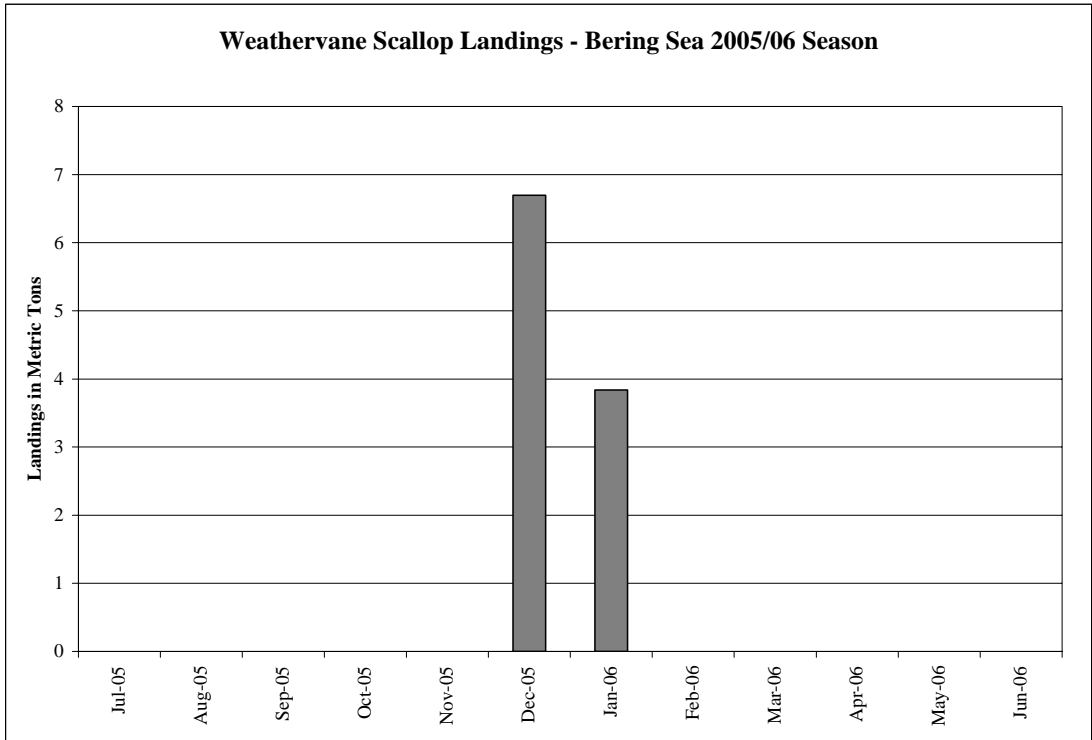
**Figure 3.21 (Historical Figure 6.8).**—Historical annual shrimp landings (in 1000 mt) in the central and westward regions (west of 144° W). Landings from Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula, Chignik, Aleutian Islands, and the Bering Sea management areas contributed to the total landings.



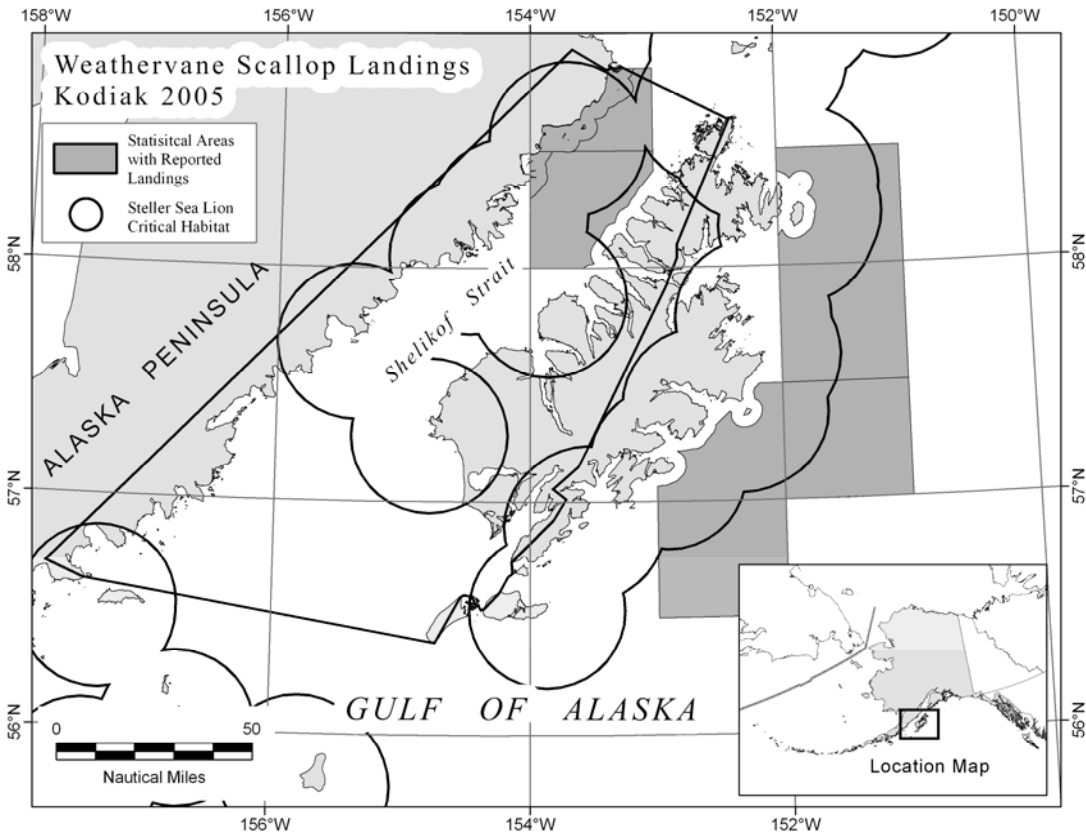
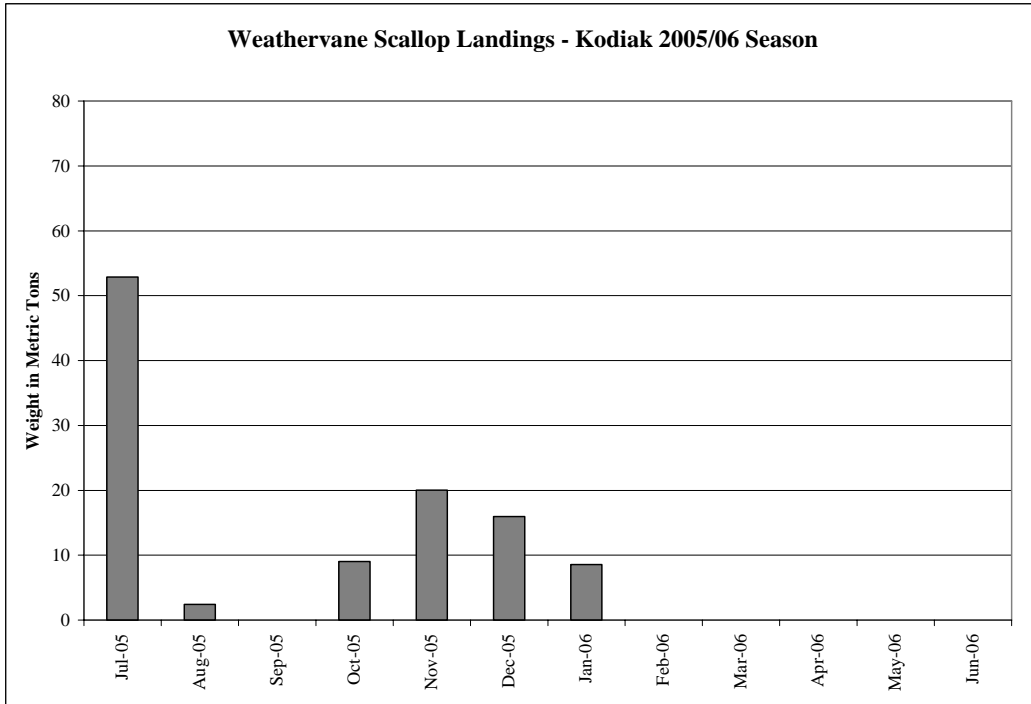
**Figure 3.22 (Historical Figure 6.9).**—Historical total annual landings (in 1000 mt) of weathervane scallop for the Lower Cook Inlet, Kodiak, Alaska Peninsula, Dutch Harbor, and Bering Sea management areas.



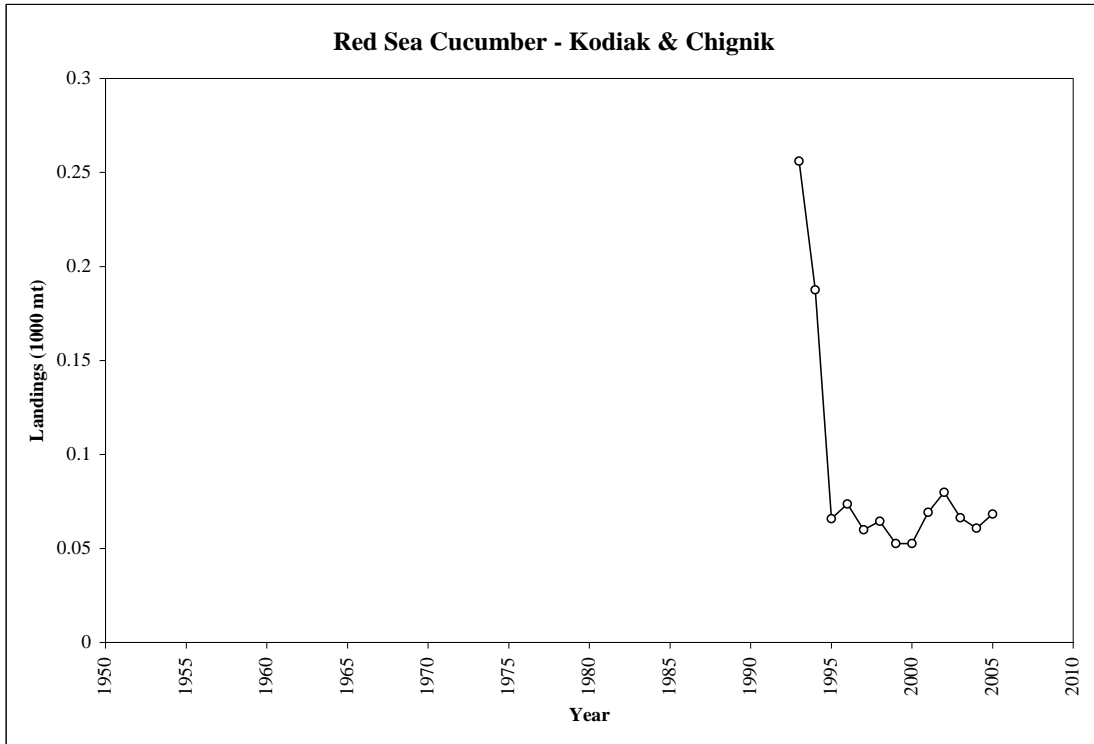
**Figure 3.23 (Historical Figure 6.27).**—Monthly distribution of scallop landings in the Prince William Sound management area, 2005 (top), and spatial distribution of scallop landings in the Prince William Sound management area, 2005 (bottom).



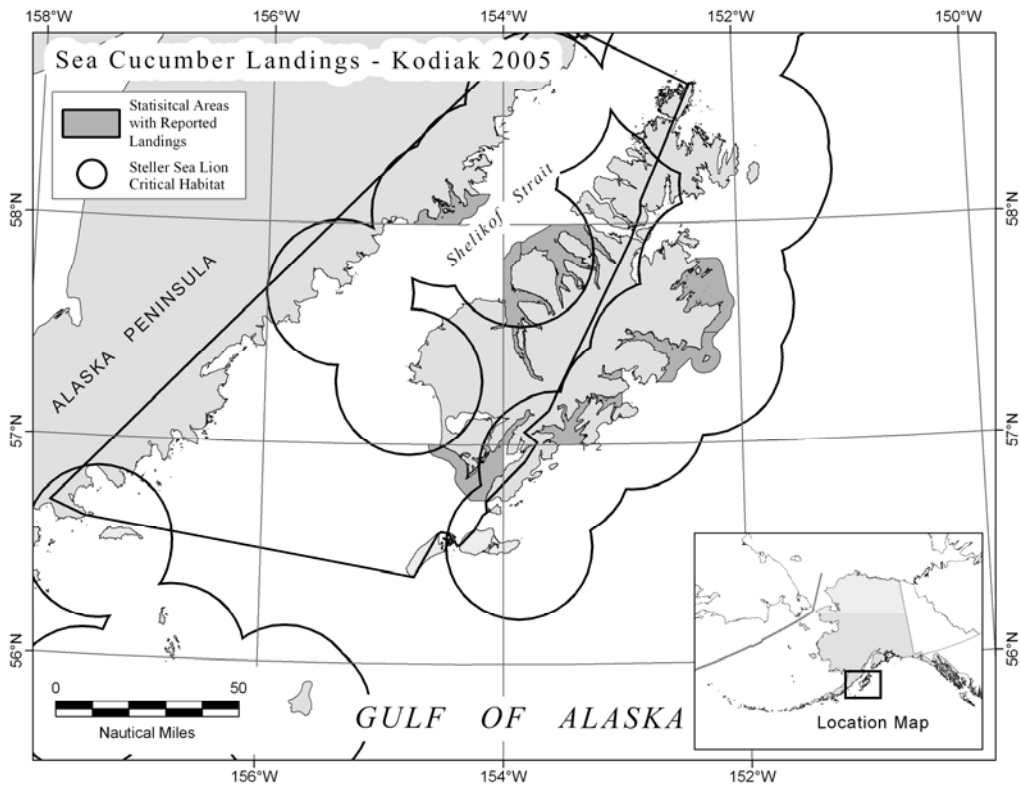
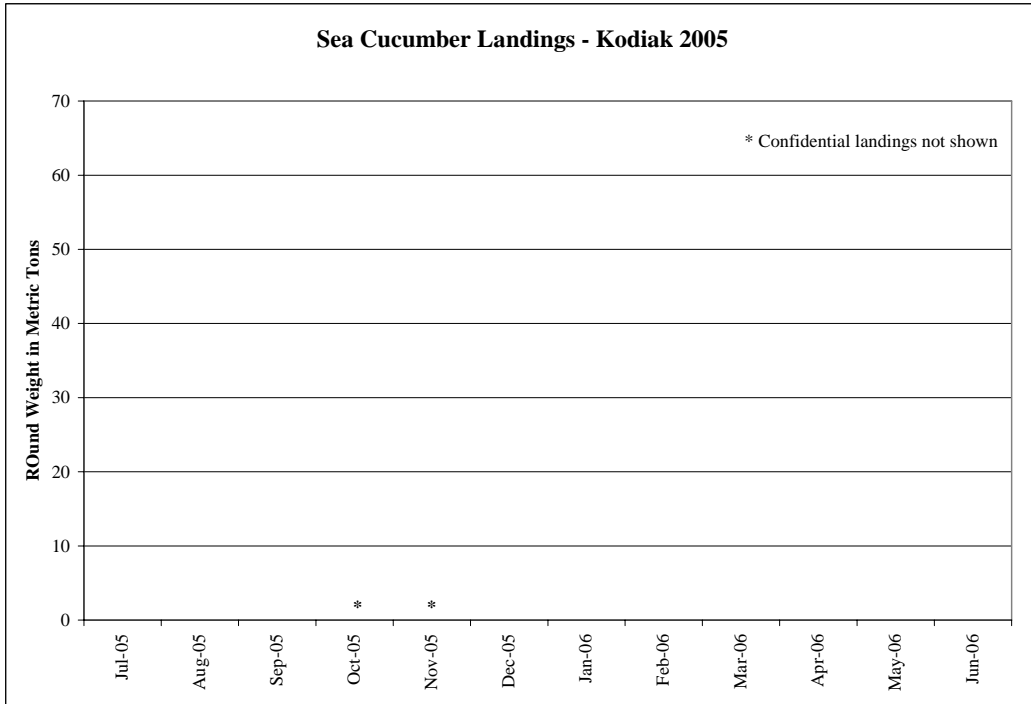
**Figure 3.24.**—Monthly distribution of scallop landings in the Bering Sea management area, 2005 (top), and spatial distribution of scallop landings in the Bering Sea management area, 2005 (bottom).



**Figure 3.25 (Historical Figure 6.19).**—Monthly distribution of scallop landings in the Kodiak management area, 2005 (top), and spatial distribution of scallop landings in the Kodiak management area, 2005 (bottom).



**Figure 3.26 (Historical Figure 6.10).**—Historical annual landings (in 1000 mt) of red sea cucumber in the Kodiak and Chignik management areas.



**Figure 3.27 (Historical Figure 6.21).**—Monthly distribution of sea cucumber landings in the Kodiak management area, 2005 (top), and spatial distribution of sea cucumber landings in the Kodiak management area, 2005 (bottom). Note the increase in y-axis scale: 0–55 mt in 1999, 0–70 mt in 2005. \* indicates confidential catch.

## 4. GROUND FISH FISHERIES (HISTORICAL CHAPTER 7)

### 4.1. OVERVIEW AND TRENDS

This chapter summarizes harvests for those groundfish fisheries discussed in the 2000 report as well as the “parallel” fisheries, which occur in state waters (0 to 3 nm offshore) at the same times and with similar regulations as the federal fisheries in the Exclusive Economic Zone (3–200nm offshore). Parallel fisheries are prosecuted for Pacific cod, walleye pollock, and Atka Mackerel. For these three species, the term “non-parallel” will be used for those state-managed fisheries which usually open after the parallel fisheries close. The state regulatory terminology for these fisheries is “state waters season.”

Groundfish fisheries in state waters west of 144° W longitude have experienced various fluctuations in the past 6 years (Figure 4.1). Landings of Pacific cod in the non-parallel state fisheries have stabilized between 10,000 and 14,000 mt since 1999, whereas the annual parallel fisheries harvests ranged from 13,000 to 19,000 mt (Figure 4.1a [Pacific cod fisheries]). The status of Pacific cod (Table 4.1) reflects the NMFS stock assessment results, indicating a lower, but stable population size in the Gulf of Alaska (GOA) relative to the 1990s.

Landings of walleye pollock dominate all groundfish landings, not only in federal waters but in state waters where landings in the parallel fisheries have varied from a low of 21,000 mt to a high of nearly 38,000 mt in the past 6 years (Figure 4.1b [walleye pollock fisheries]). Non-parallel harvests of pollock in state waters are much smaller, averaging about 1,000 mt in that time. Directed Atka mackerel harvests occur only in the parallel season in state waters, and these have varied widely from 12 to 88 mt in the past 6 years (Figure 4.1c [Atka mackerel fisheries]). Landings of sablefish have declined in recent years, to levels similar to the late 1990s (Figure 4.1d [sablefish fisheries]). Landings of lingcod have been somewhat cyclic and similar in magnitude to landings prior to 2000 (Figure 4.1e [lingcod fisheries]). Rockfish landings have declined from levels seen in the 1990s to 159 mt in 2005 (Figure 4.1f [rockfish fisheries]).

### 4.2. FISHERY STATUS IN 2005

Landings of Pacific cod in non-parallel state-managed fisheries in 2005 totaled 12,800 mt in the CGOA, WGOA, and Aleutian Islands (Table 4.1 and Figures 4.2–4.11), accounting for only 9.7% of the total Pacific cod harvest in Alaskan waters (including the EEZ) west of 144° W longitude. Of the non-parallel state-managed catch, 41% came from the South Alaska Peninsula, 30% from the Kodiak area, and 21% from the Chignik area. Only 8% of the total was landed from Cook Inlet, and less than ½% from PWS. Test fisheries harvested an additional 121.8 mt. Commercial fishery harvest locations in PWS in the non-parallel fishery were mostly west of Montague Island in the western limit of the management area (Figure 4.2). Parallel fishery landings in PWS were much more widely distributed, with highest catches east of Hinchinbrook Island (Figure 4.3). Parallel fishery catches of cod were highest in April and August.

Cod catches in Cook Inlet in 2005 were highest in outer Kachemak Bay, and to a lesser extent on the outer Kenai coast (Figure 4.4) in a pattern similar to the catch distribution in 1999. Parallel fishery catches were more widely distributed than the non-parallel state-managed catches extending northeast to Resurrection Bay (Figure 4.5). Harvest locations in the Kodiak, Chignik, and Peninsula areas were more widely dispersed, with distributions similar to 1999 (Figures 4.6, 4.8, 4.10). Catches in the parallel fisheries occurred in largely the same locations as the non-parallel state-managed fisheries for each of those areas (Figure 4.7, 4.9, 4.11). Peak catches in the non-parallel state fisheries were in February and March in Cook Inlet, February through



April in Kodiak waters, March through May in Chignik, and primarily in March south of the Peninsula (Figures 4.4–4.11). The seasonal distribution in Kodiak waters in 2005 was more compressed than in 1999 when there was also a fall component to the catch. In the Kodiak, Chignik, and Peninsula areas in 2005, the pot fisheries reached their allocations first followed by jig gear. Cod harvests in 2005 in state waters of the Aleutian Islands area occurred only in the parallel season. Peak harvests were in February, March and April, but with landings in all months (Figures 4.12 and 4.13). Catches were distributed across the chain in state waters of most major islands, as well as the northwest side of Unimak Island.

The PWS pollock fishery, the only non-parallel state-managed pollock trawl fishery, opened January 20, 2005 with a GHF of 923 mt. The GHF was distributed between 3 sections with no more than 40% of the harvest from any one section. Most of the harvest occurred in early March and the fishery closed by emergency order March 9, 2005 in part due to the attainment of the miscellaneous groundfish bycatch cap. Harvests were primarily from the Inside District waters of the Hinchinbrook section and from southwest PWS in the Port Bainbridge and Knight Island sections (Figures 4.14).

Parallel seasons for pollock were opened in 2005 in state waters of Kodiak Island, as well as the Chignik, South Alaska Peninsula, and Aleutian Islands management areas. Harvests from Kodiak occurred in most of the statistical areas of the island and often within SSL critical habitat (Figure 4.15). Parallel pollock harvests in the Chignik area were localized (Figure 4.16), whereas harvests in the South Alaska Peninsula area were more widespread (Figure 4.17). In both areas, harvest locations included designated SSL critical habitat. Parallel harvests in the Aleutian Islands management area occurred in the eastern and central parts of the chain, with the largest harvests in the vicinity of Unalaska Island. The 2005 season in the Aleutians was the first since 1999, and was opened to promote development of the fishery near Adak. Due to various constraints, the Adak area harvests were quite small compared to harvests from the Unalaska Island area.

Parallel fishery harvests of Atka Mackerel were largest in June and August in 2005, and were taken primarily in the vicinity of Unalaska Island (Figure 4.19). This fishery, not previously described in the 2000 report (Kruse et al. 2000), is prosecuted with bottom trawl gear largely outside of state waters. There are no state-managed Atka mackerel fisheries outside of the federal season.

Sablefish landings in state-managed fisheries in the CGOA, WGOA, and BSAI totaled 228.6 mt in 2005 (percentages by area are confidential). An additional 45.7 mt was taken in test fisheries. Sablefish catches in PWS were concentrated in the deep, western side of the Inside District waters, and were landed during the split season, March to May, and again in August when the fishery peaked (Figure 4.20). Cook Inlet area catches occurred during July 15 to July 23, the open season in 2005, and from state waters at, and south, of Resurrection Bay (Figure 4.21). Sablefish catches in the Aleutian Islands extended from May through October, with highest harvests taken in the central Aleutians in the vicinity of Kanaga and Atka Islands (Figure 4.22), as seen in 1999.

Commercial lingcod catches totaled 50 mt in 2005 from the CGOA and WGOA. An additional 5.3 mt was taken as bycatch in other fisheries, including catches outside of the directed season of July through December. Most (58%) of the commercial harvest was taken from the Kodiak area, with 22% and 19% from PWS and Cook Inlet management areas, respectively. Catches in PWS were distributed across much of the management area, including the EEZ, with commercial

landings peaking in July when the directed fishery opened statewide (Figure 4.23). Cook Inlet area catches were taken primarily from the outer coast of the Kenai Peninsula, with landings made principally in July and August (Figure 4.24). Harvests in Kodiak waters were most concentrated in the northeast sections in the EEZ. Landings peaked in September (Figure 4.25). PWS, Cook Inlet, and Kodiak harvests were more widespread within each management area in 2005 as compared with 1999.

Rockfish landings in state-managed fisheries totaled 158.9 mt, with an additional 7.7 mt of bycatch. The largest catches came from the Kodiak management area, followed by the Cook Inlet area, the South Alaska Peninsula area, PWS, Chignik, and the Aleutian Islands. Black rockfish accounted for most (75.1%) of the state-managed catch, followed by yelloweye (11.6%), shortraker (5.9%), roughey (5.4%), thornyheads (1.1%), and 15 other species each comprising less than 1% of the harvest by weight.

Rockfish in PWS are restricted to bycatch only and landings were primarily yelloweye (34% by weight), roughey (29%), and shortraker (26%). Landings in PWS were made primarily from March through September as bycatch to the halibut fishery and were distributed throughout the management area (Figure 4.26). Landings in the Cook Inlet management area were primarily black rockfish (71%) and yelloweye (25%) taken from the outer coast of the Kenai Peninsula (Figure 4.27) from March to December with peak harvests during the open directed fishery in July and August. Black rockfish made up 96% of the rockfish landings in the Kodiak area, and these were brought in from February through October, with peak landings in July (Figure 4.28). Harvest locations were well distributed around the island, including nearshore and EEZ waters. Rockfish landings in the Chignik area were almost entirely black rockfish (99%). These landings peaked in April with the largest catches coming from the northeastern sections of the management area (Figure 4.29). Black rockfish were also the primary species caught in the South Alaska Peninsula area (97%), with harvests peaking from March through May (Figure 4.30). Catches were widely distributed in the nearshore and the EEZ with peak catches taken in state waters in the eastern portions of the management area. The mostly minor landings of rockfish in the Aleutian Islands area were a mix of black (42%), thornyhead (41%), and shortraker rockfish (13%). These were taken primarily near Dutch Harbor (Unalaska Island) from June to August (Figure 4.31).

### **4.3. PACIFIC COD IN THE ALEUTIAN ISLANDS**

The Alaska Board of Fisheries approved the opening of a new non-parallel state waters Pacific cod fishery in the Aleutian Islands area, west of 170° W longitude, beginning March 15, 2006 after the conclusion of the parallel fishery. This new state fishery was open for jig, pot, longline, and non-pelagic trawl gear types. Trawl and longline gear are prohibited from May 1, 2006 through September 15, 2006 unless operating in the 60 foot and under vessel size limitation areas near Adak Island. In Sitkin Sound, near Adak Island, the vessel size limit is in effect year-round for all gear types. All SSL closures that are in effect during the parallel season also apply in the state waters fishery. The GHL for the fishery was set at 5,807 mt, which was 3 percent of the final BSAI ABC of 194,000 mt. The fishery was managed so that a maximum of 70 percent of the GHL would be available to harvest prior to June 10, 2006. Harvests in March reached approximately 3,300 mt (preliminary value) taken in state waters of Attu, Adak, and Atka Islands (Figure 4.31).

The remaining 30 percent of the GHL plus any rollover from the first season was made available beginning June 10, 2006. All vessels were required to register with the department, and the

registration was non-exclusive. The department required daily reporting of each vessel's harvest. The daily harvest limit for each vessel was 150,000 pounds round weight, with a maximum of 300,000 pounds of unprocessed Pacific cod onboard. All Pacific cod taken were required to be retained, and any overages had to be reported immediately to the department. As currently written, the management plan for the state waters fishery sunsets December 31, 2007.

There were 26 vessels that registered and participated in the fishery, including one very large factory trawler (296'), five freezer longliners (over 60'), one large pot vessel (over 60'), sixteen large trawlers (over 60'), and three small trawlers (under 60'). In addition, two floating processors and two shore based processors participated. Observer coverage and vessel monitoring systems (VMS) are not required during the state-waters fishery, however six fishing vessels voluntarily carried a federal groundfish observer and 23 vessels indicated that VMS was to be activated during the fishery.

#### **4.4 OVERLAP OF GROUND FISH FISHERIES AND STELLER SEA LION CRITICAL HABITAT**

There continues to be extensive overlap between the locations of state-managed groundfish fisheries and areas designated to be SSL critical habitat. The overlap was increase in the central Aleutian Islands with the advent of the state-managed Pacific cod fishery west of 170° W longitude.

#### **4.5 DIRECT FISHERY INTERACTIONS**

As summarized in the 2000 report, the record of incidental SSL mortality shows very low rates for fixed gear (including pot, jig, and longline) fisheries as compared to trawl fisheries. The pollock fishery in PWS, a very limited and infrequent sablefish trawl fishery in PWS, and the new Pacific cod fishery in the Aleutian Islands are the primary state-managed groundfish fisheries where trawls are permitted west of 144° W longitude. There are no observer requirements for state-managed groundfish fisheries and as a consequence there are no observer data for these fisheries. As noted in the 2000 report, the inside district of PWS has been divided into three management sections to disperse pollock harvest and reduce the likelihood of fishery interactions with SSL. The Pacific cod fishery in the Aleutians is temporally dispersed to some degree in that the first portion of the fishery beginning in March is limited to 70% of the harvest, with 30% reserved for the June opening.

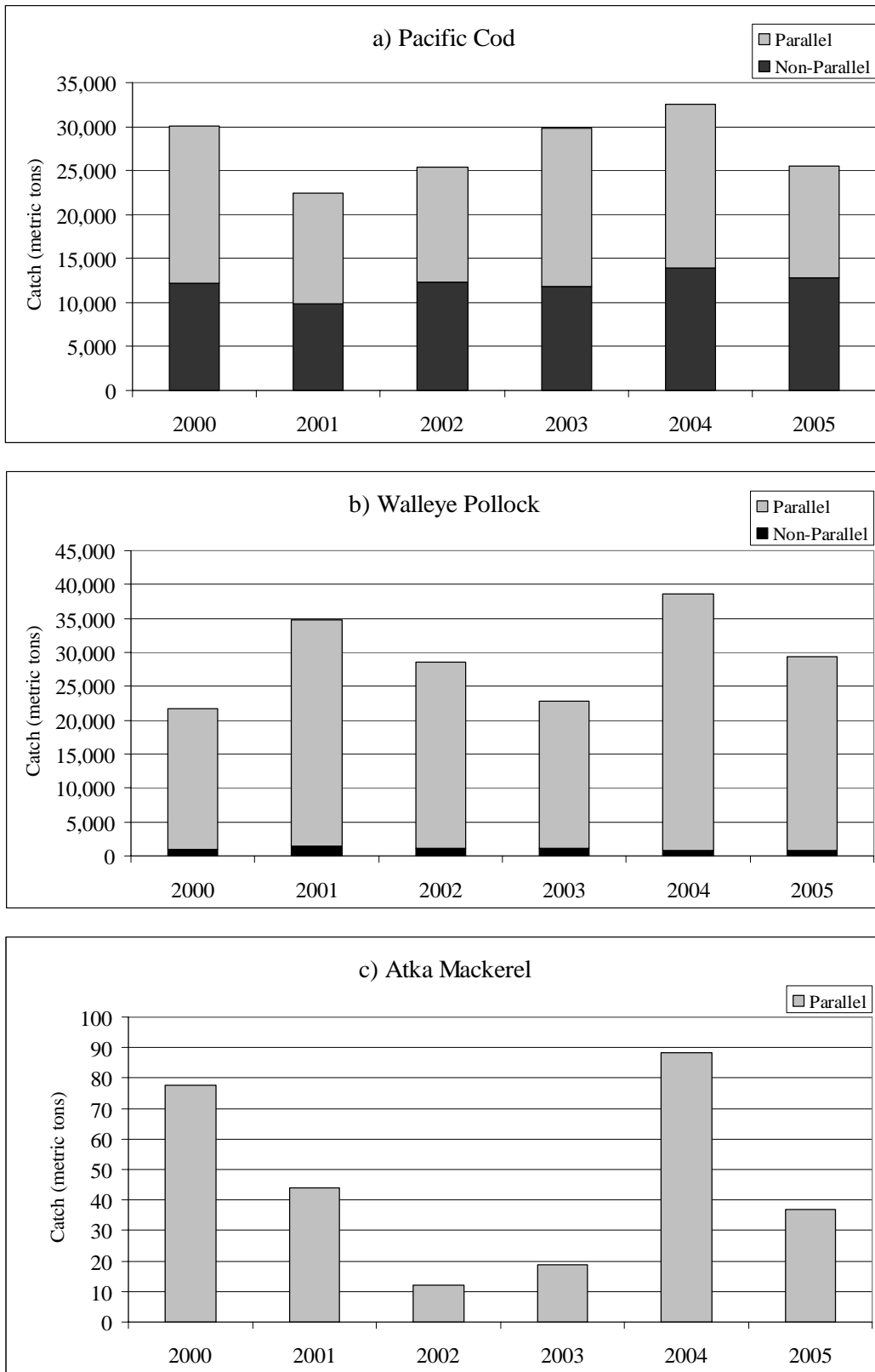
**Table 4.1 (Historical Table 7.1).**—Status of state-managed groundfish fisheries in 2005. \* indicates confidential catch.

Fishery	Primary Gear Types	Assess. Method	Stock Component	Exploitable Biomass (mt)	Stock Status Relative to The Mean	Three-year Stock Trend	Harvest Rate Policy	Season Length	Catch (mt)
PWS Pacific cod	Pot/jig	LSSM	Age 3+	308,102 <sup>a</sup>	Below	Declining	≤ 25% of EGOA TAC	2/3–12/31	55
LCI Pacific cod	Pot/jig	LSSM	Age 3+	308,102 <sup>a</sup>	Below	Declining	≤ 3.75% of CGOA TAC	1/27–12/31	1,052
Kodiak Pacific cod	Pot/jig	LSSM	Age 3+	308,102 <sup>a</sup>	Below	Declining	≤ 12.5% of CGOA TAC	2/2–2/13 pot	3,877
Chignik Pacific cod	Pot/jig	LSSM	Age 3+	308,102 <sup>a</sup>	Below	Declining	≤ 8.75% of CGOA TAC	3/1–5/10 pot	*
S. AK Pen. P. cod	Pot/jig	LSSM	Age 3+	308,102 <sup>a</sup>	Below	Declining	≤ 25% of WGOA TAC	3/3–3/24	5,187
PWS Pollock	Trawl	Survey	Age 2+	7,283	Below	Declining	0.75 x M = 22.5%	1/20–3/9	*
PWS Sablefish	Longline	ASSA	Age 4+	99,000 <sup>b</sup>	Below	Declining	Habitat–yield Model	3/15–5/15	99
LCI Sablefish	Longline	ASSA	Age 4+	99,000 <sup>b</sup>	Below	Declining	% change in fed. TAC	7/15–7/23	*
Aleutian Is. Sablefish	Longline	ASSA	Age 4+	99,000 <sup>b</sup>	Below	Declining	% change in fed. TAC	5/15–11/15 7/1–8/5 (outside) & 10/13 (inside)	1.7
PWS Lingcod	Longline Longline & Jig	N/A	—	N/A	Uncertain	Uncertain	75% of 10–year ave.		12
LCI Lingcod	Jig	N/A	—	N/A	Uncertain	Uncertain	50% of 5–year ave.	7/1–12/31	10
Kodiak Lingcod	Jig/other Jig & Longline	N/A	—	N/A	Uncertain	Uncertain	Bycatch levels only	7/1–12/31	30
PWS Rockfish	Longline Longline & Jig	N/A	—	N/A	Uncertain	Uncertain	Long–term ave. GHL	Year-round bycatch-only	25
LCI Rockfish	Jig	N/A	—	N/A	Uncertain	Uncertain	Conservative GHL	7/1–12/31	29
Kodiak Rockfish	Jig	N/A	—	N/A	Uncertain	Uncertain	Conservative GHL	1/1–12/31	53
Chignik Rockfish	Jig	N/A	—	N/A	Uncertain	Uncertain	Conservative GHL	1/1–12/31	*
S. AK Pen. Rockfish	Jig	N/A	—	N/A	Uncertain	Uncertain	Conservative GHL	1/1–12/31	*
AI Rockfish	Jig	N/A	—	N/A	Uncertain	Uncertain	Conservative GHL	1/1–12/31	*

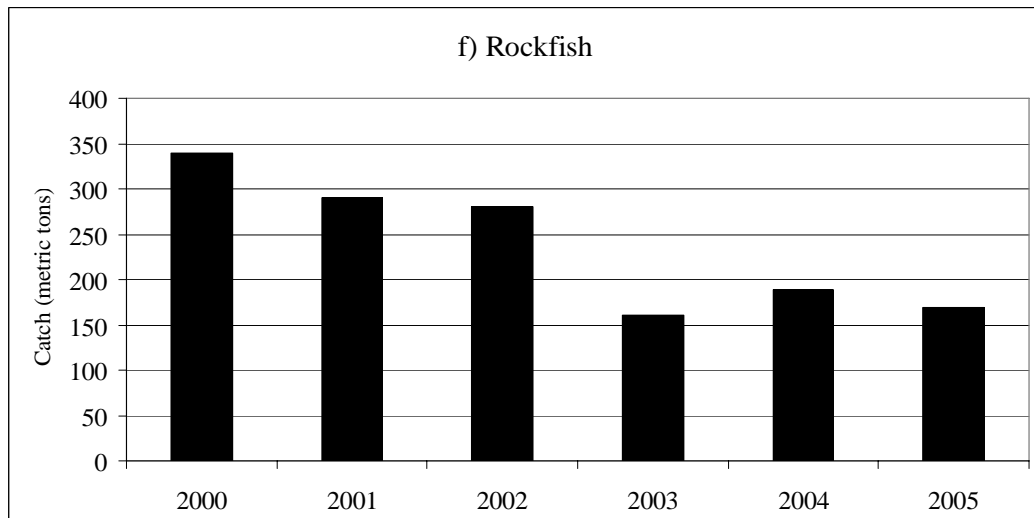
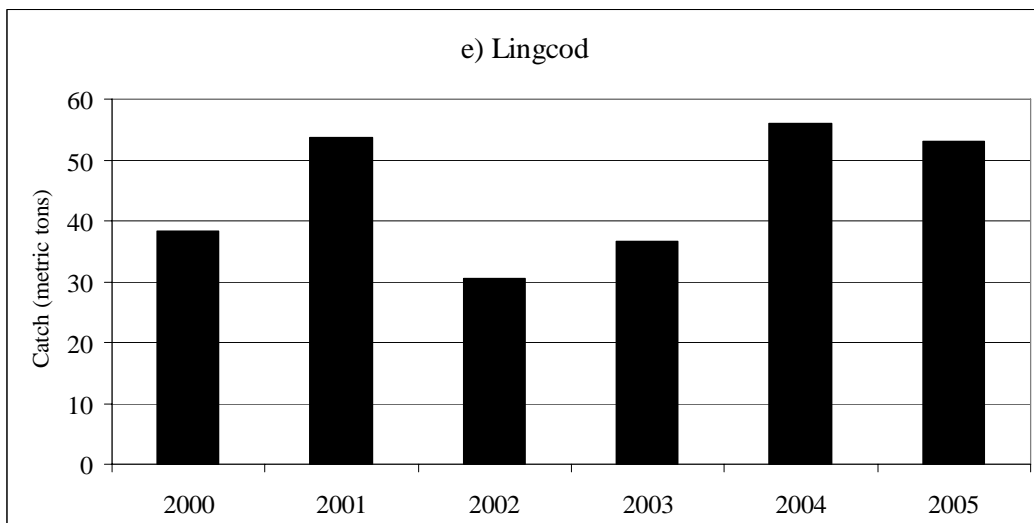
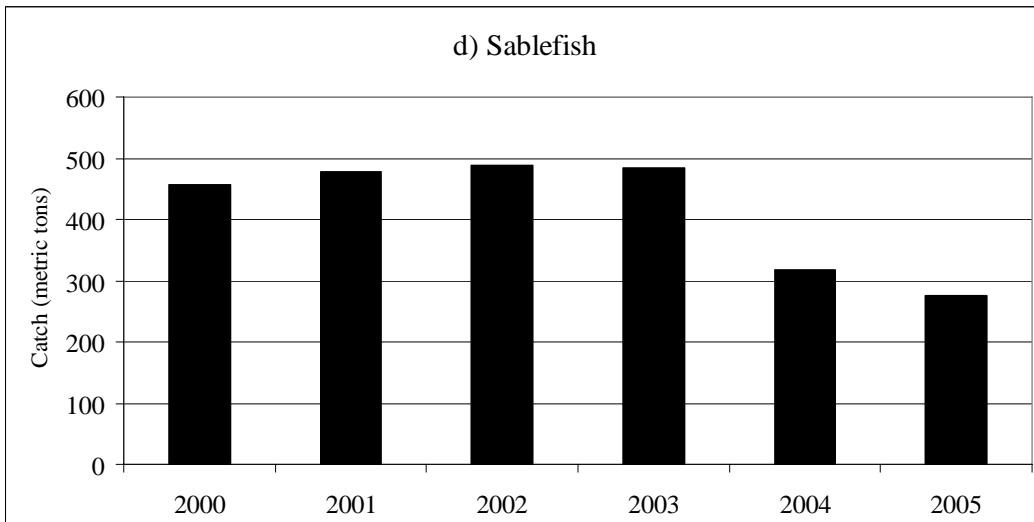
Acronyms: Management Area – Prince William Sound (PWS), lower Cook Inlet (LCI), South Alaska Peninsula (S. AK Pen.), Aleutian Islands (AI), eastern, central and western Gulf of Alaska (EGOA, CGOA, WGOA). Assessment method – length-structured Synthesis Model (LLSM), age-structured separable sequential population analysis (ASSA). Harvest rate policy – Total allowable catch (TAC), and guideline harvest level (GHL).

<sup>a</sup> Biomass of Pacific cod in the entire GOA

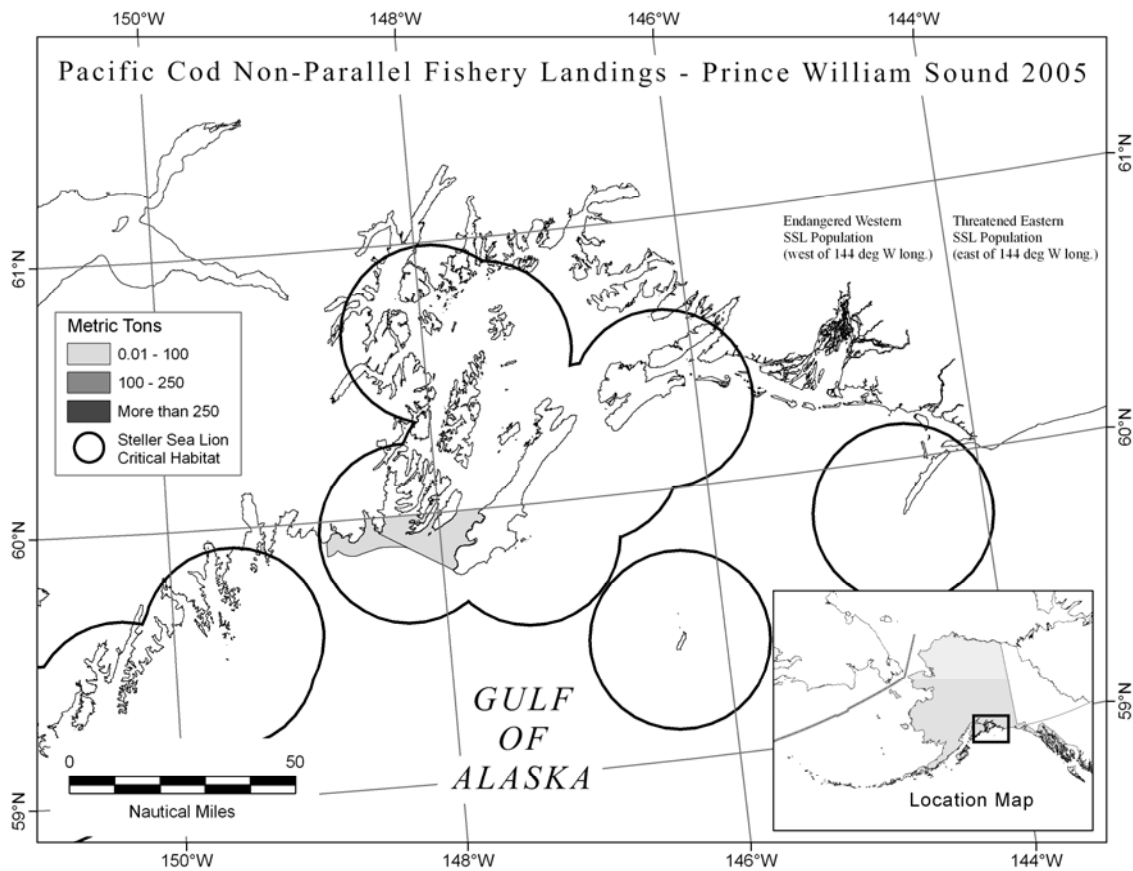
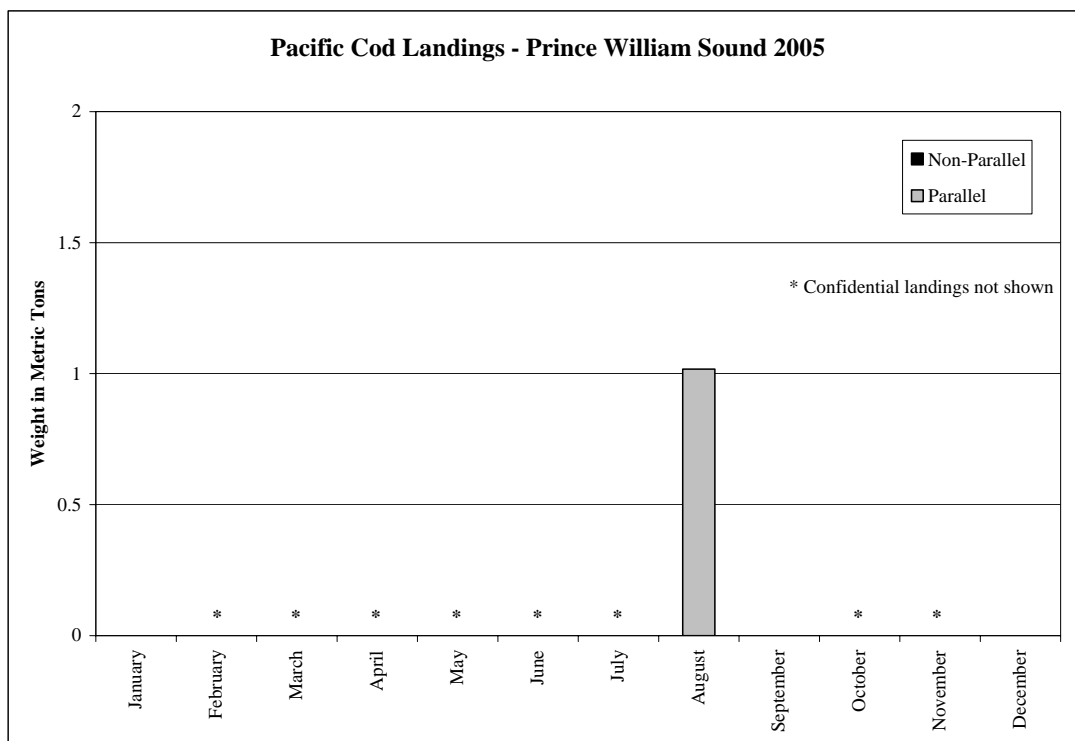
<sup>b</sup> Biomass of sablefish in Western and Central GOA.



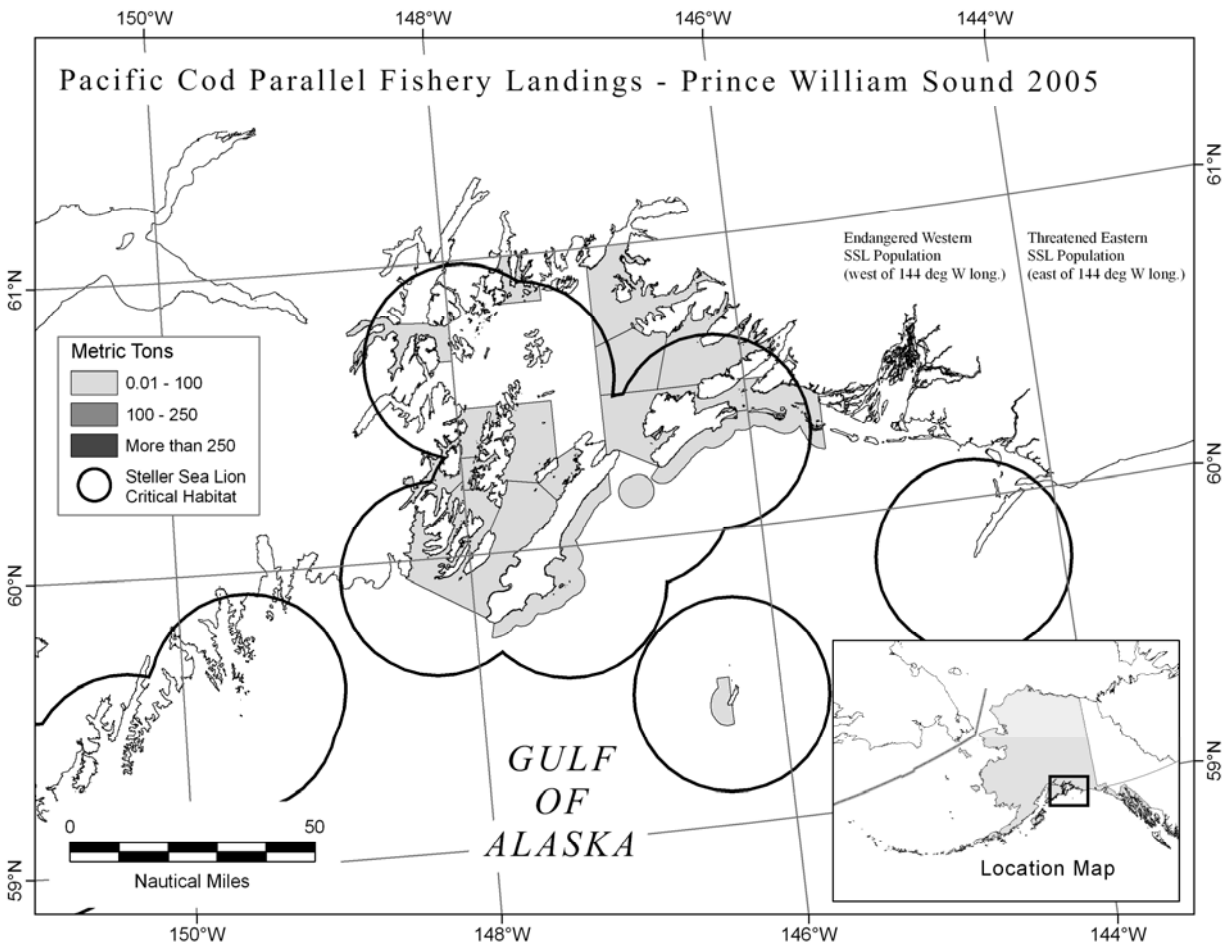
**Figure 4.1.** –Landings of a) Pacific cod, b) walleye pollock, c) Atka mackerel, d) sablefish, e) lingcod, and f) rockfish fisheries west of 144° W. long. in Alaska. Gray bars indicate landings in the parallel fisheries and black bars indicate landings in the non-parallel fisheries.



**Figure 4.1**–Page 2 of 2.

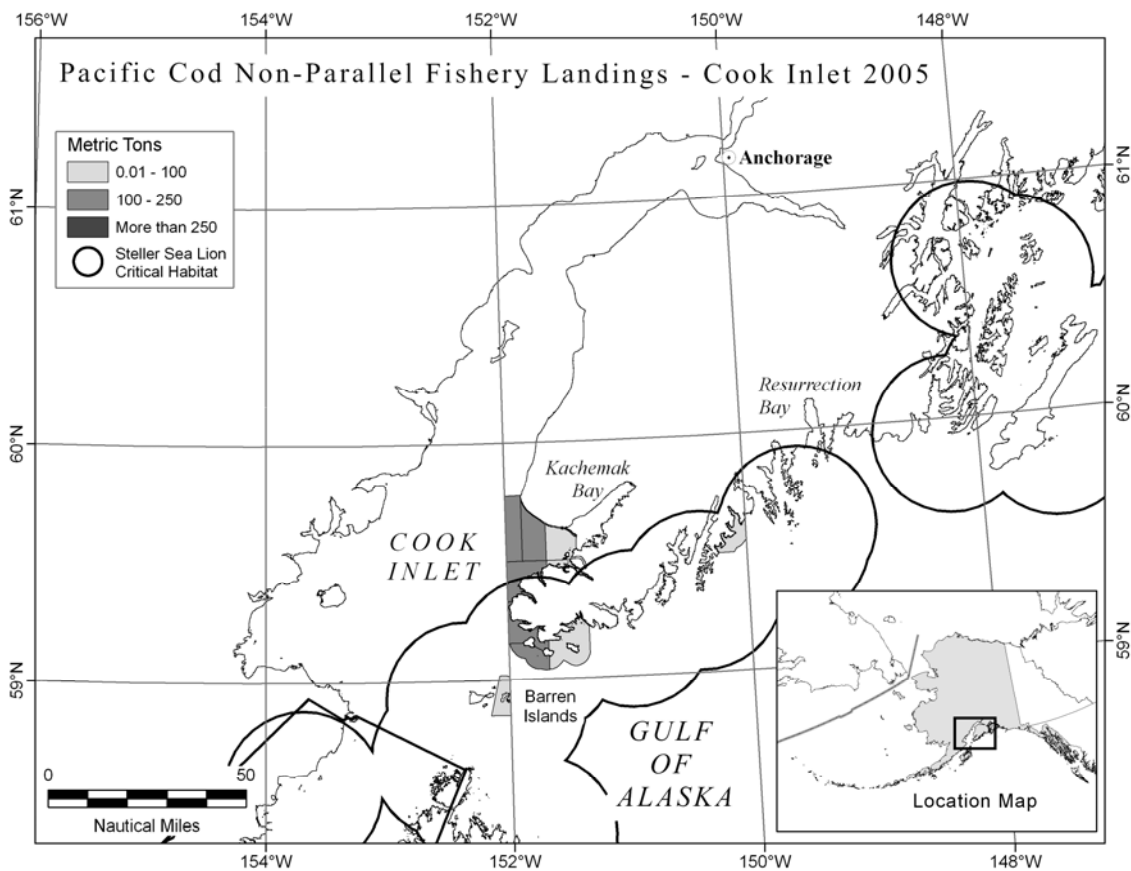
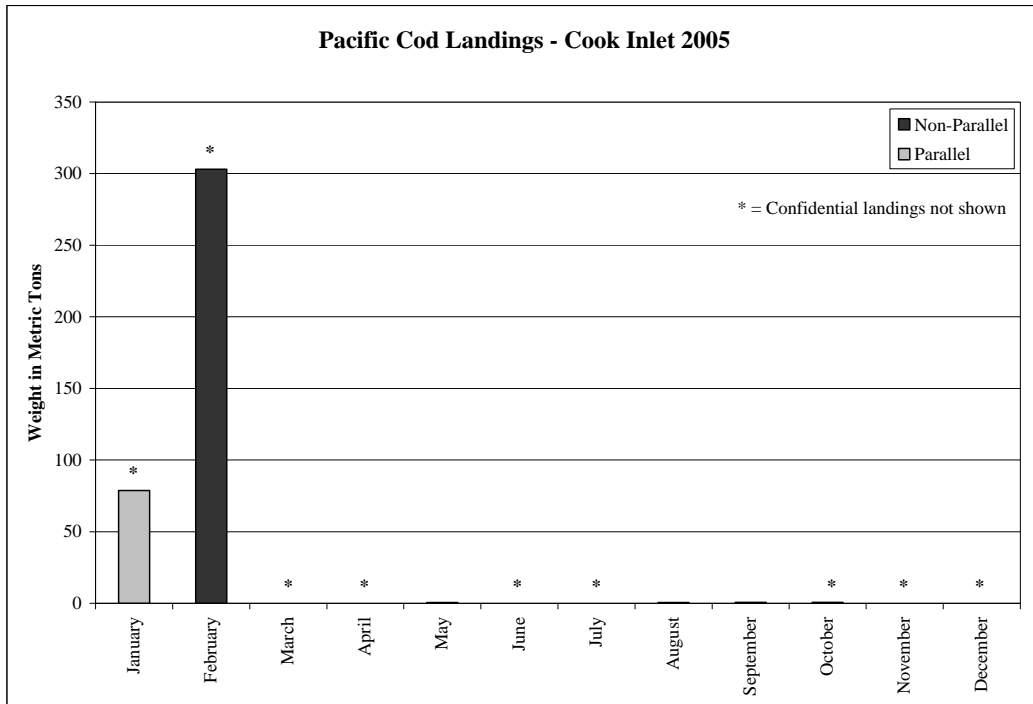


**Figure 4.2 (Historical Figure 7.1).**—Monthly distribution of Pacific cod landings in the Prince William Sound management area, 2005 (top), and spatial distribution of non-parallel fishery Pacific cod landings in the Prince William Sound management area, 2005 (bottom). \* indicates confidential catch. Note the change in y-axis scale; 0–3,000 mt in 1999, 0–2 mt in 2005.

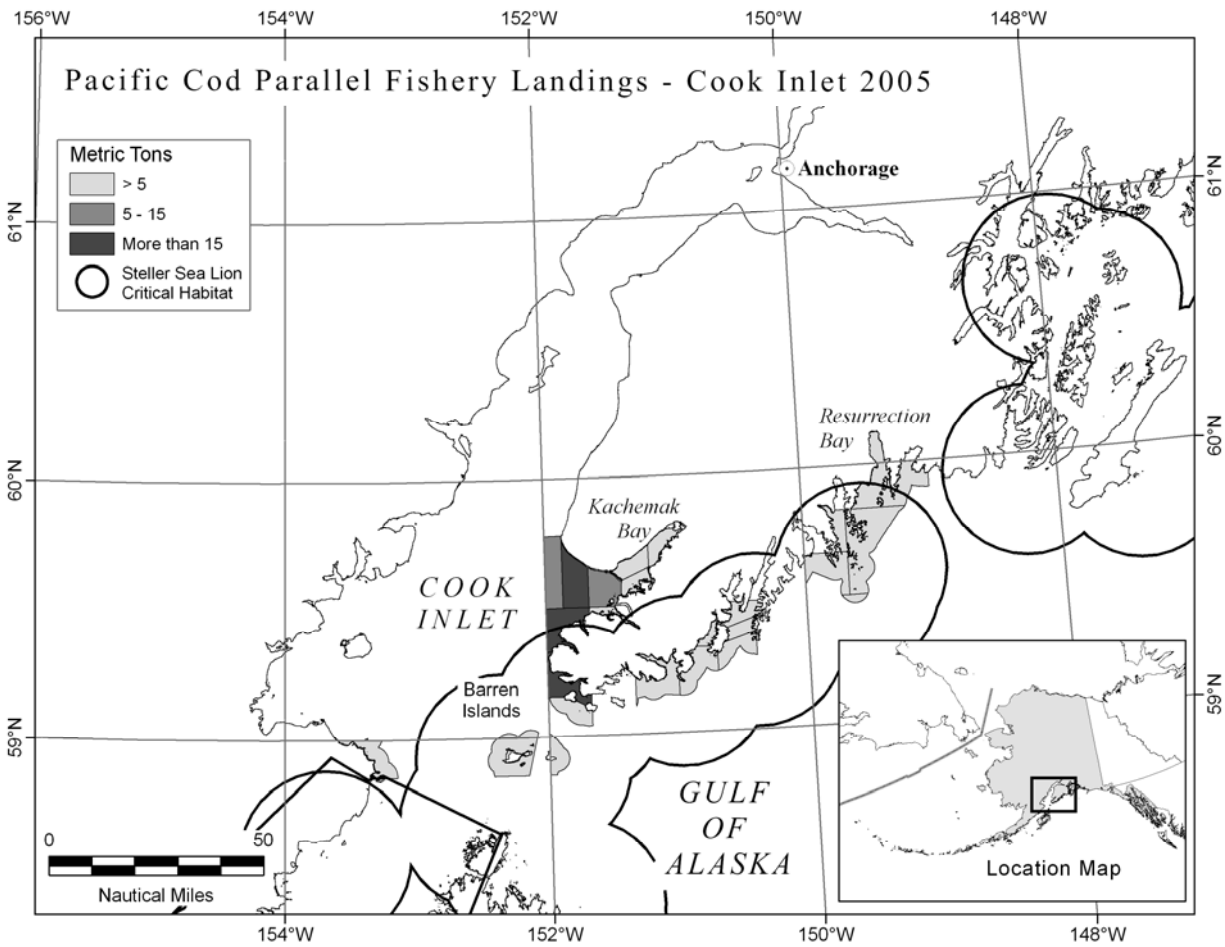


**Figure 4.3.**—Spatial distribution of parallel fishery Pacific cod landings in the Prince William Sound management area, 2005.

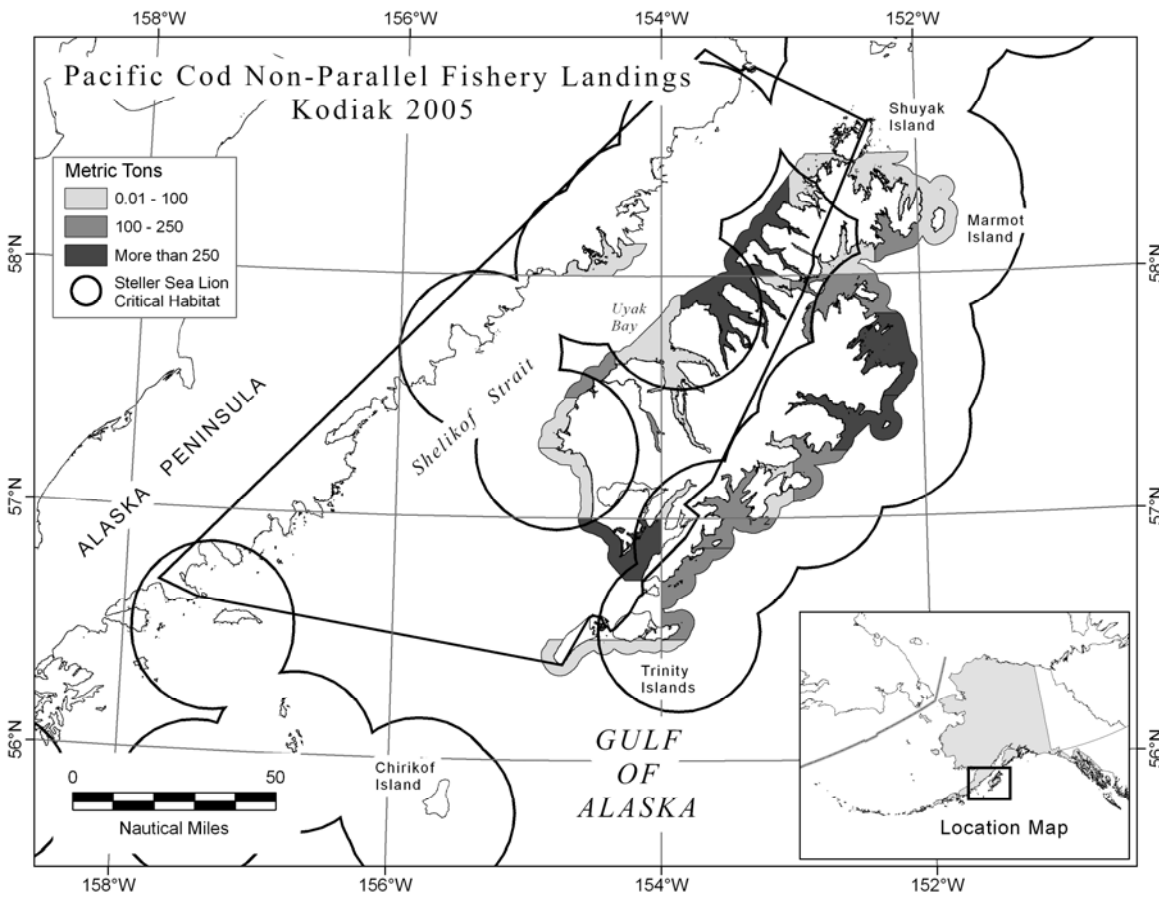
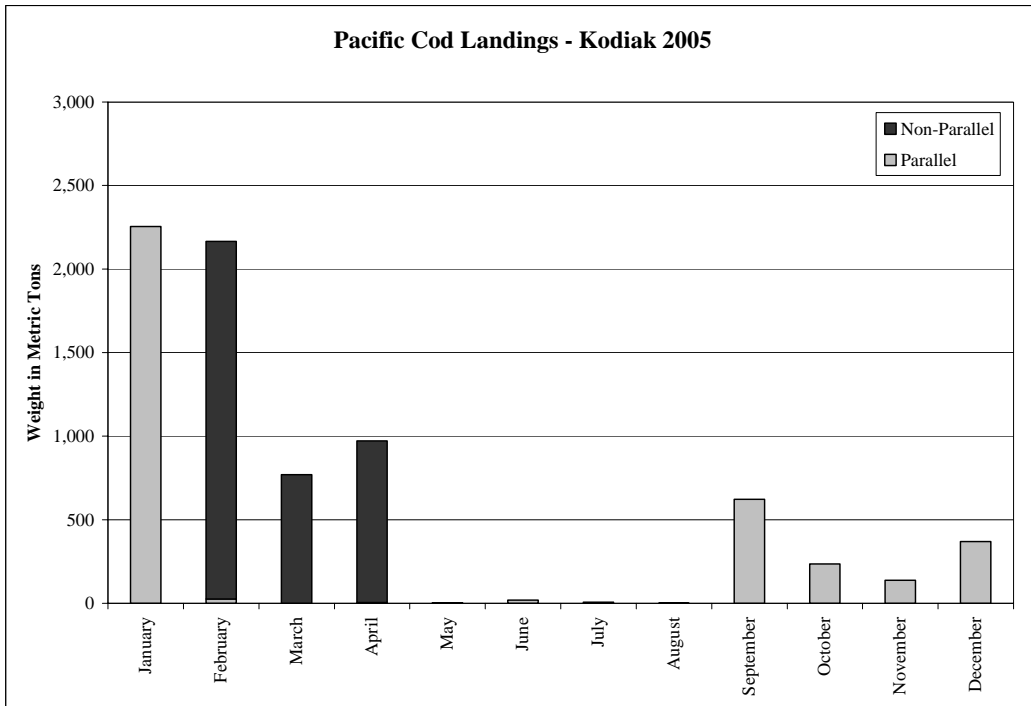




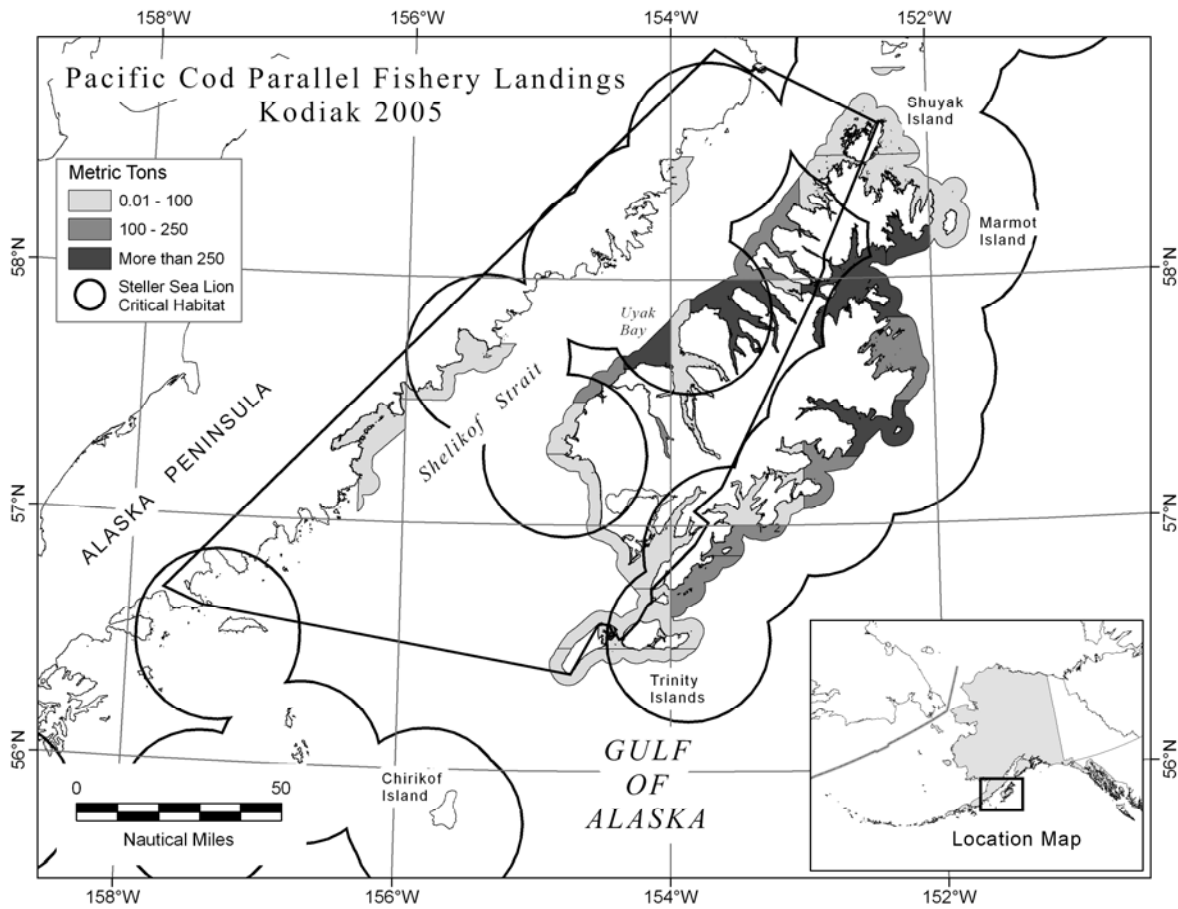
**Figure 4.4 (Historical Figure 7.2).**—Monthly distribution of Pacific cod landings in the Cook Inlet management area, 2005 (top), and spatial distribution of Pacific cod non-parallel fishery landings in the Cook Inlet management area, 2005 (bottom). \* indicates confidential catch. Note the change in y-axis scale; 0–3,000 mt in 1999, 0–700 mt in 2005. Non-parallel fishery landings were confidential in January and parallel fishery landings were confidential in February.



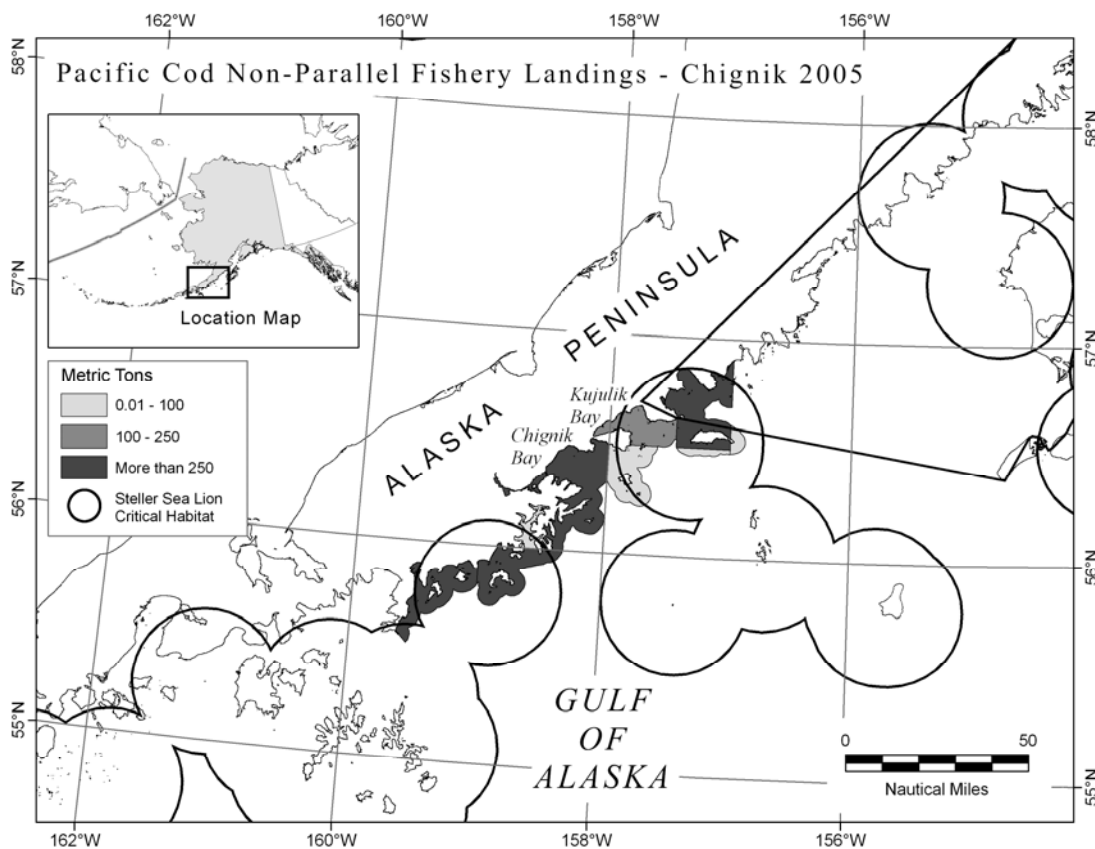
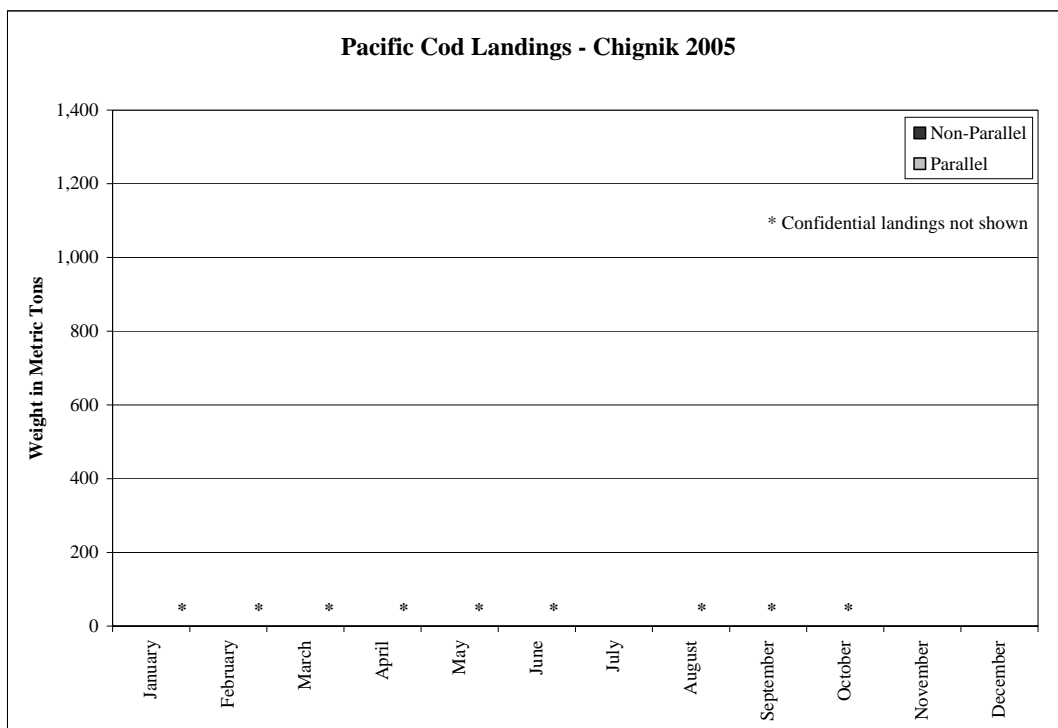
**Figure 4.5.**—Spatial distribution of Pacific cod parallel fishery landings in the Cook Inlet management area, 2005.



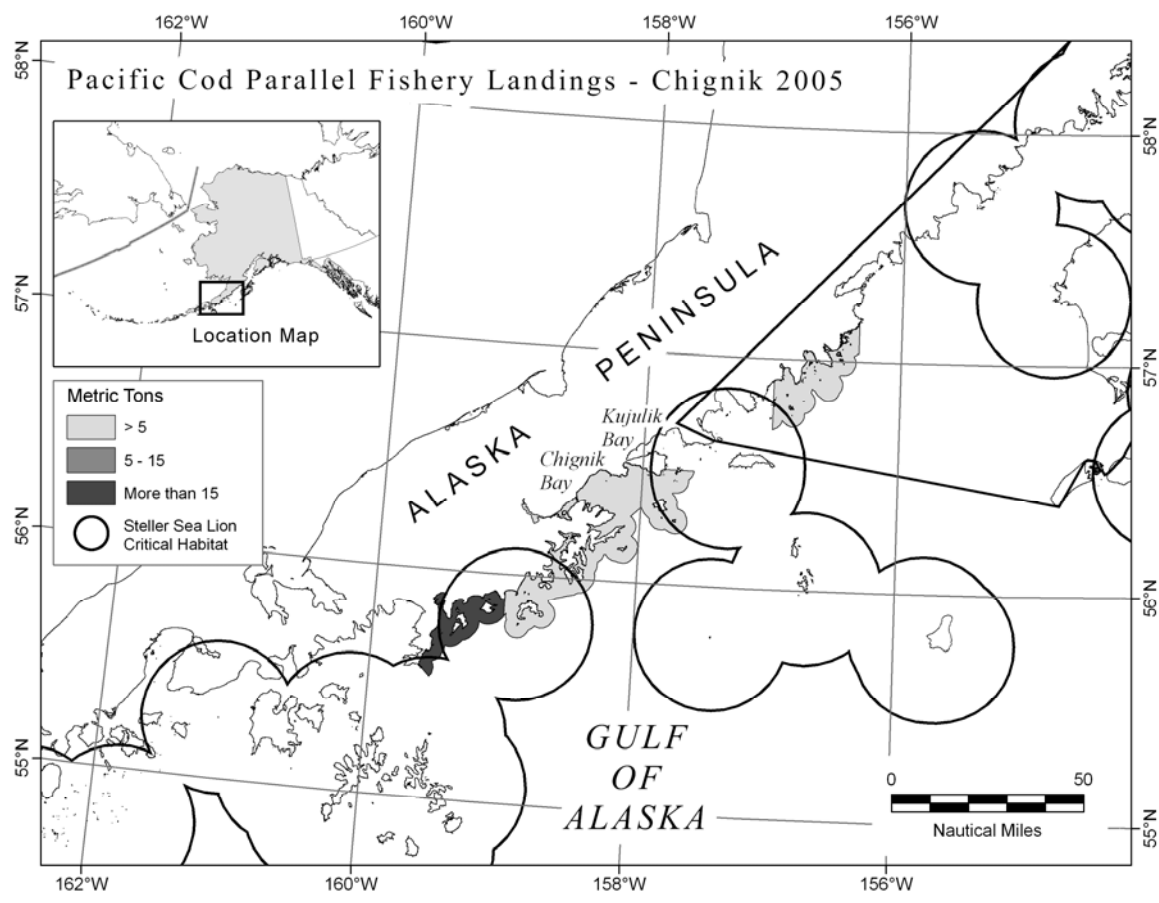
**Figure 4.6 (Historical Figure 7.3).**—Monthly distribution of Pacific cod landings in the Kodiak management area, 2005 (top), and spatial distribution of non-parallel fishery Pacific cod landings in the Kodiak management area, 2005 (bottom).



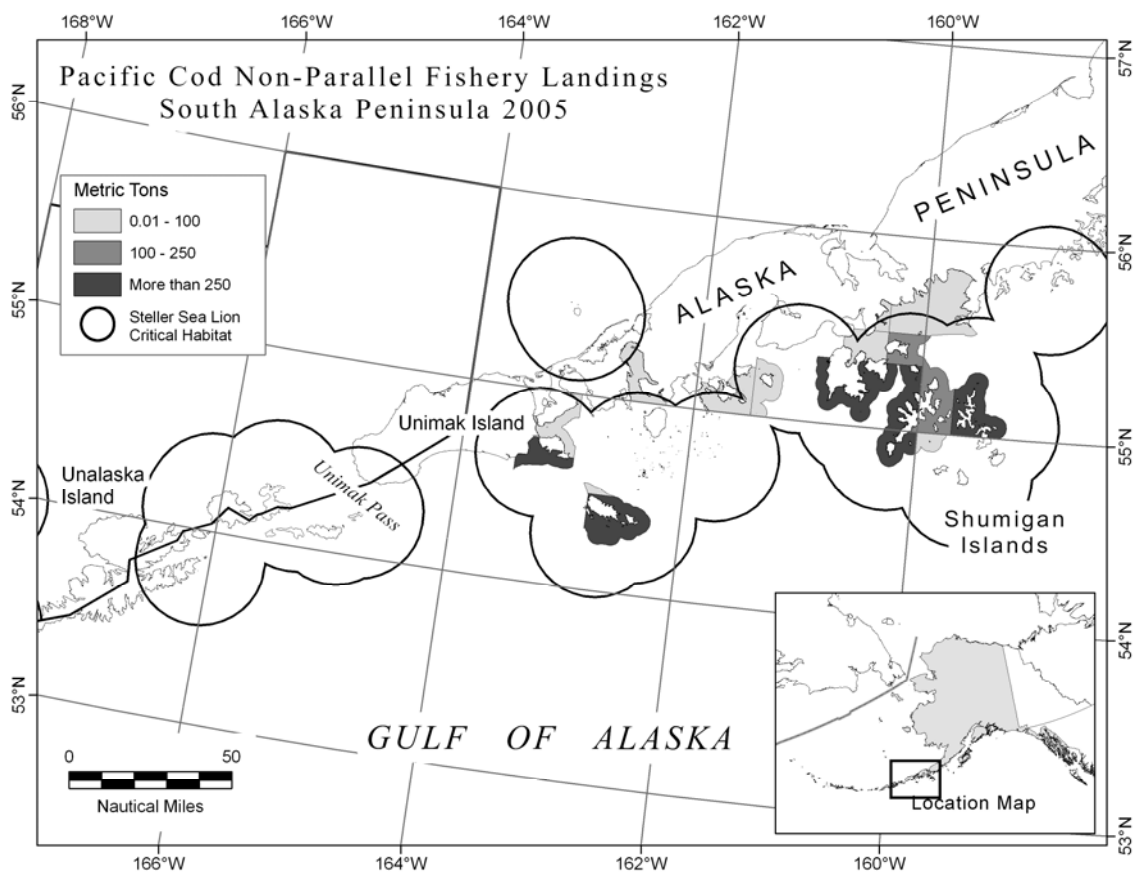
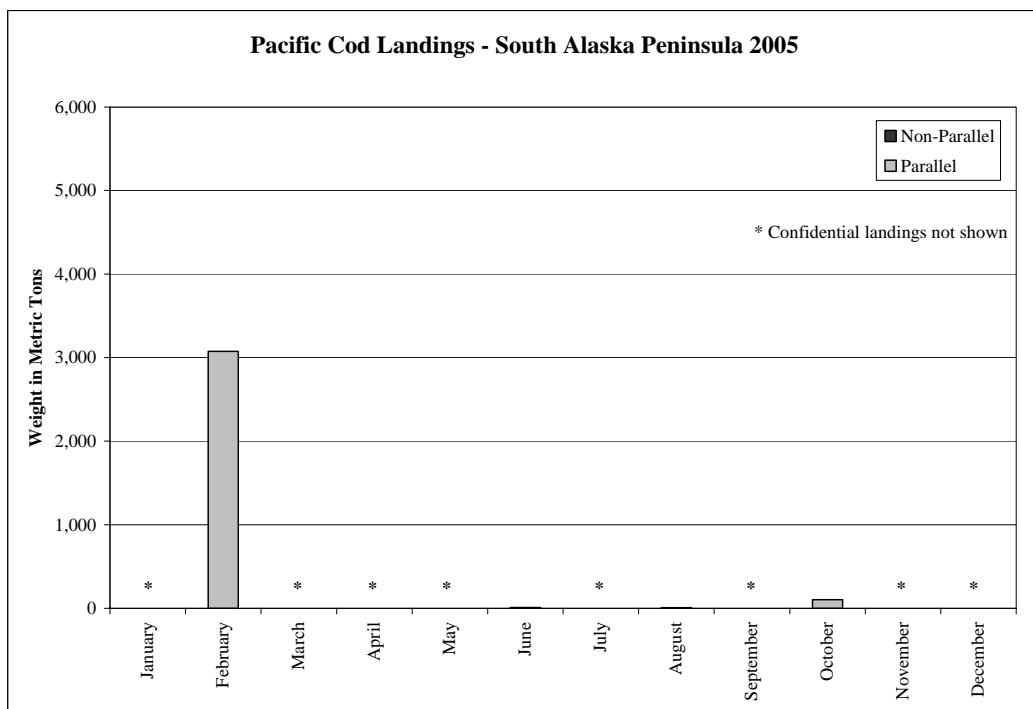
**Figure 4.7.** –Spatial distribution of parallel fishery Pacific cod landings in the Kodiak management area, 2005.



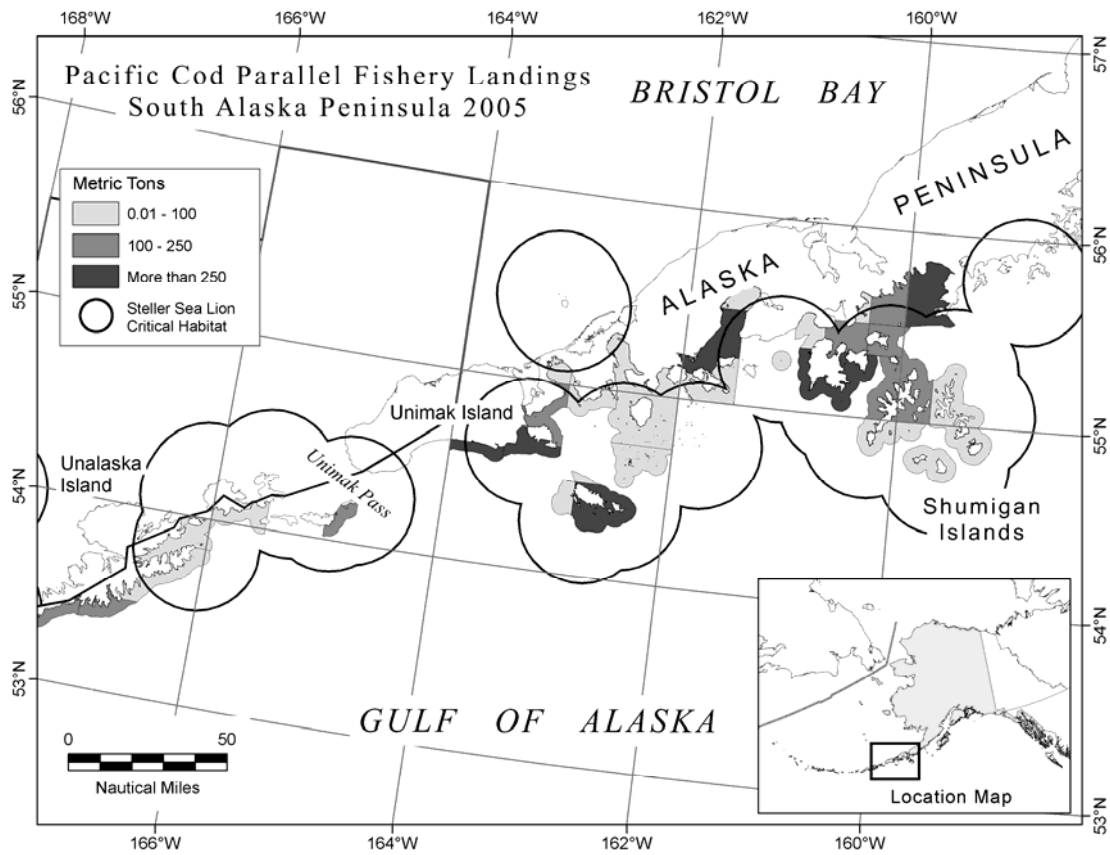
**Figure 4.8 (Historical Figure 7.4).**—Monthly distribution of Pacific cod landings in the Chignik management area, 2005 (top), and spatial distribution of Pacific cod non-parallel fishery landings in the Chignik management area, 2005 (bottom). Note the change in y-axis scale; 0–3,000 mt in 1999, 0–1,400 mt in 2005. \* indicates confidential landing.



**Figure 4.9.**—Spatial distribution of Pacific cod parallel fishery landings in the Chignik management area, 2005.

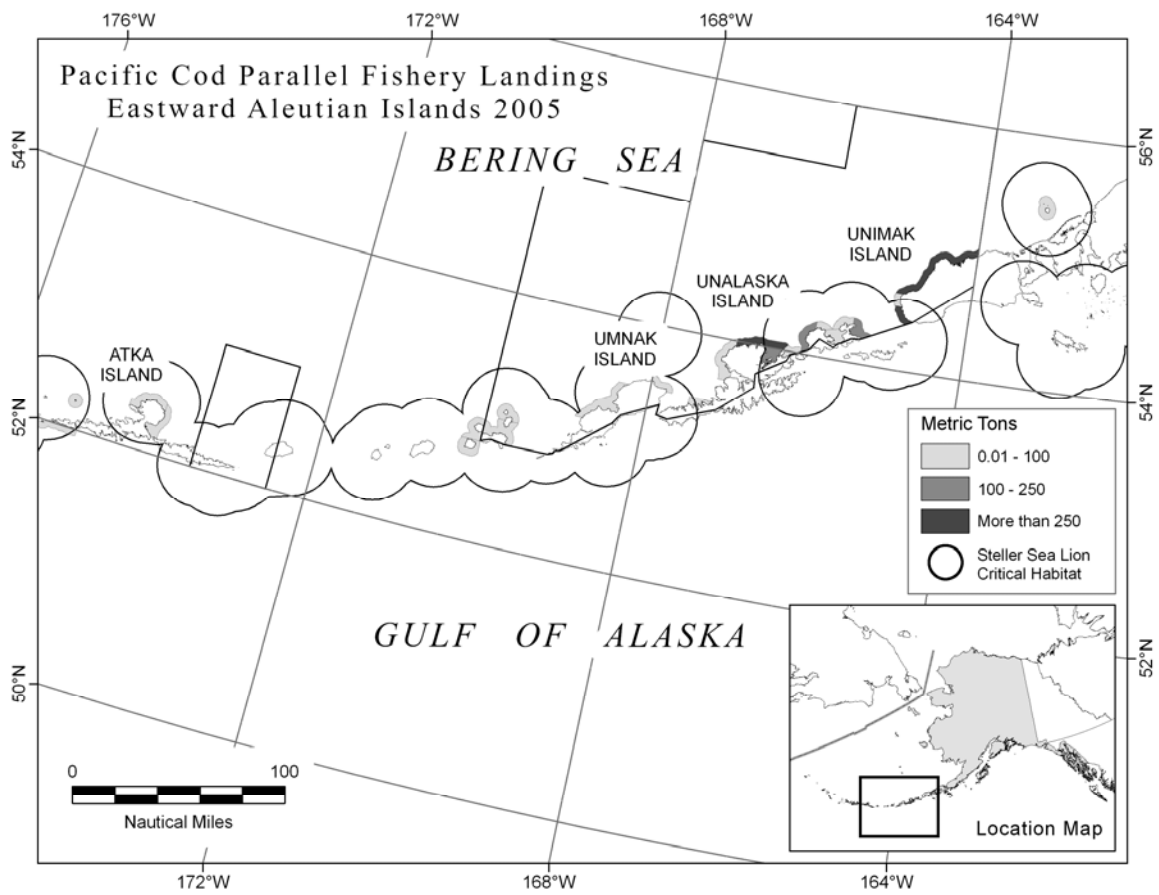
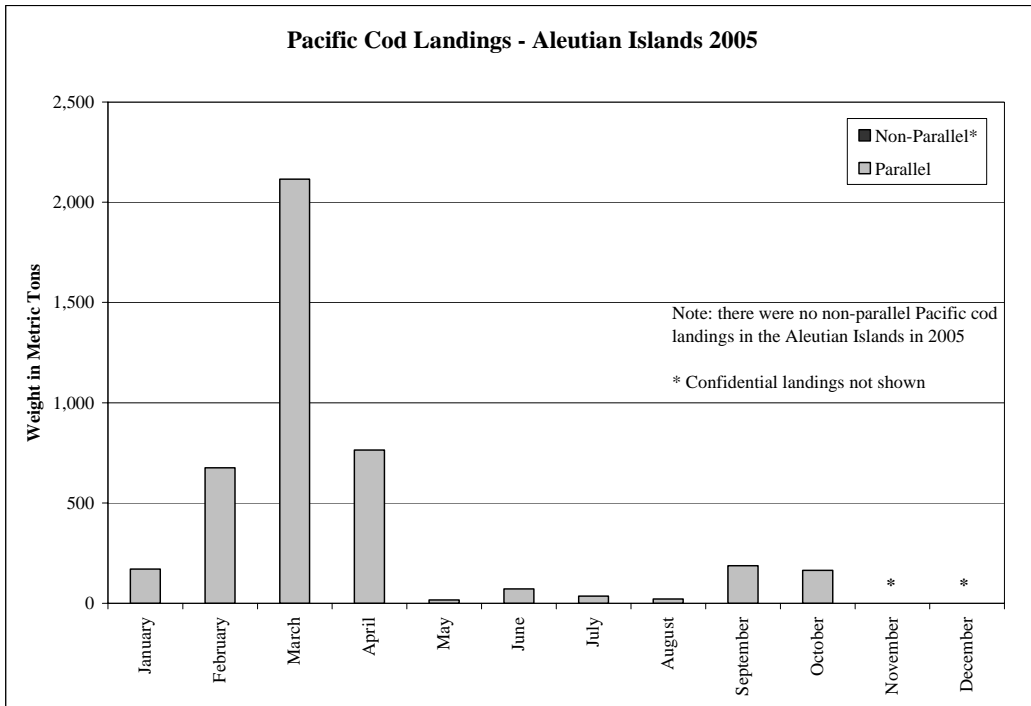


**Figure 4.10 (Historical Figure 7.5).**—Monthly distribution of Pacific cod landings in the South Alaska Peninsula management area, 2005 (top), and spatial distribution of Pacific cod non-parallel fishery landings in the South Alaska Peninsula management area, 2005 (bottom). Note the increase in y-axis scale: 0–3,000 mt in 1999, 0–6,000 mt in 2005. \* indicates confidential landing.

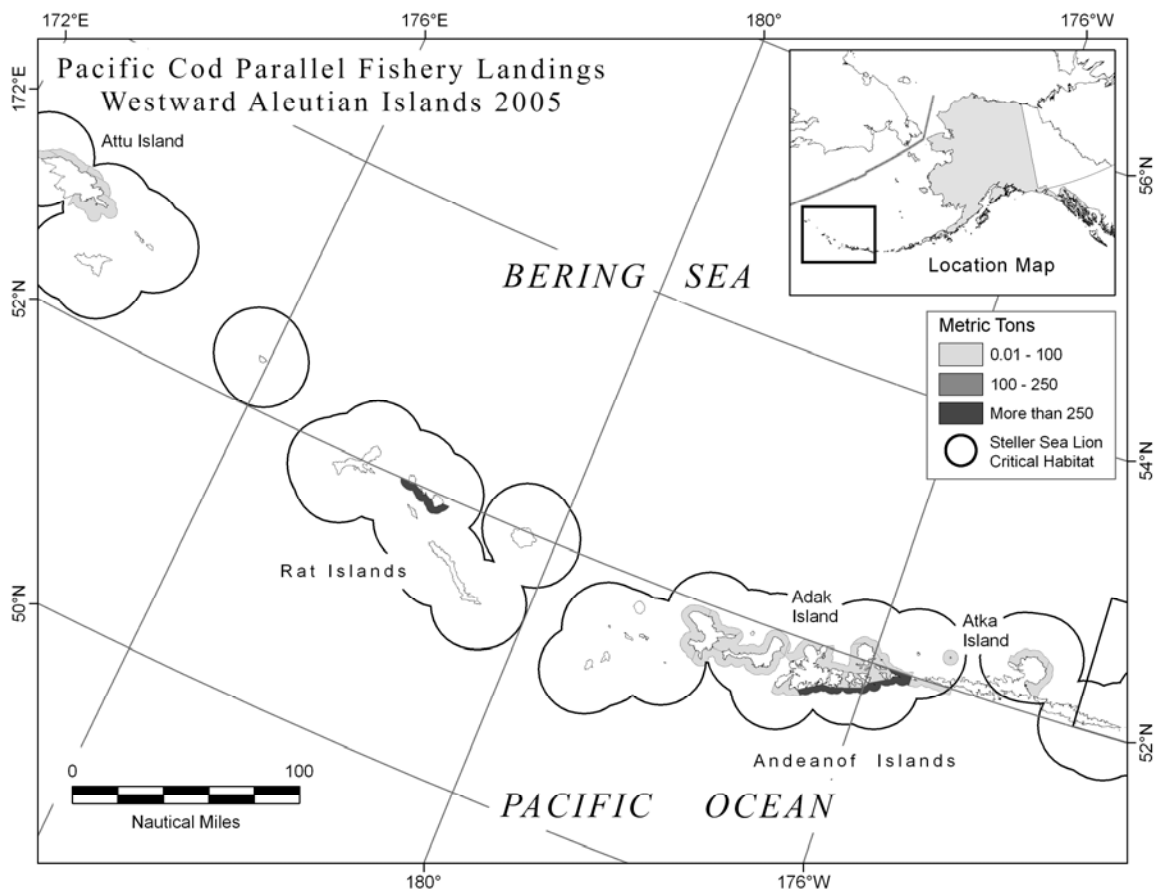


**Figure 4.11.**—Spatial distribution of Pacific cod parallel fishery landings in the South Alaska Peninsula management area, 2005.

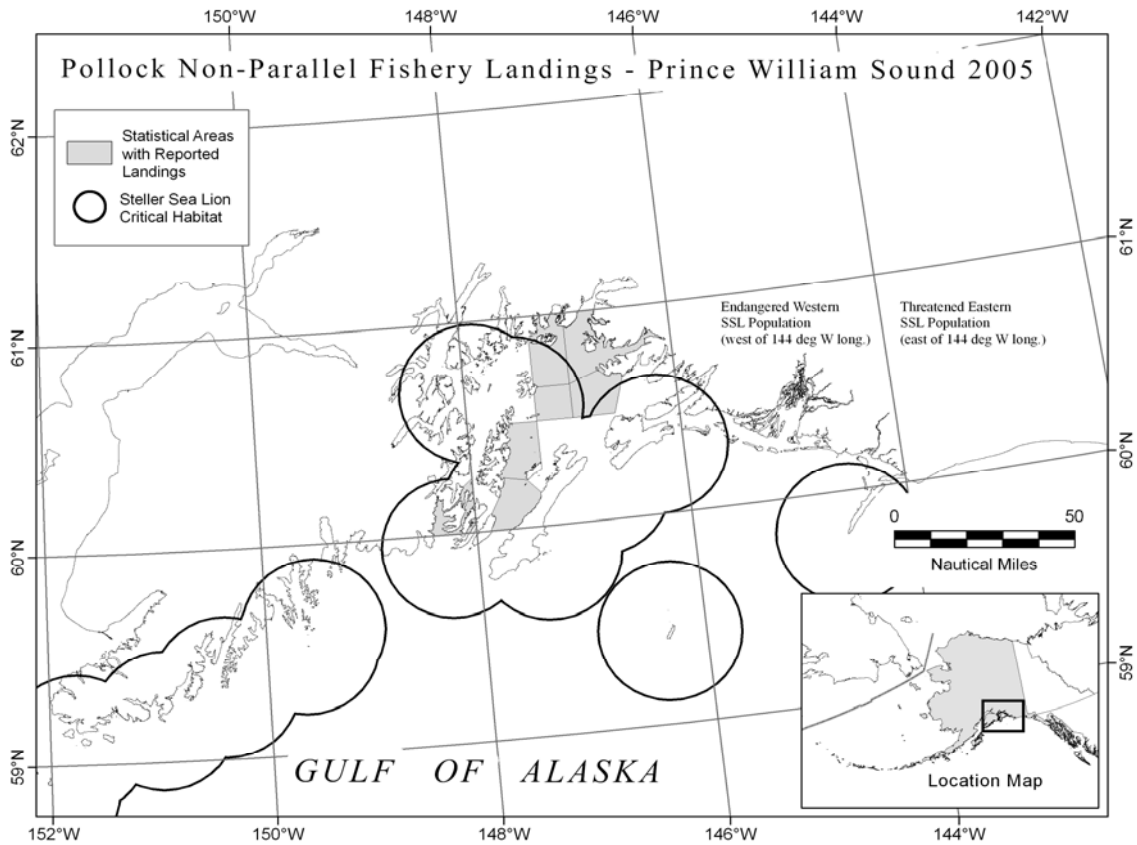
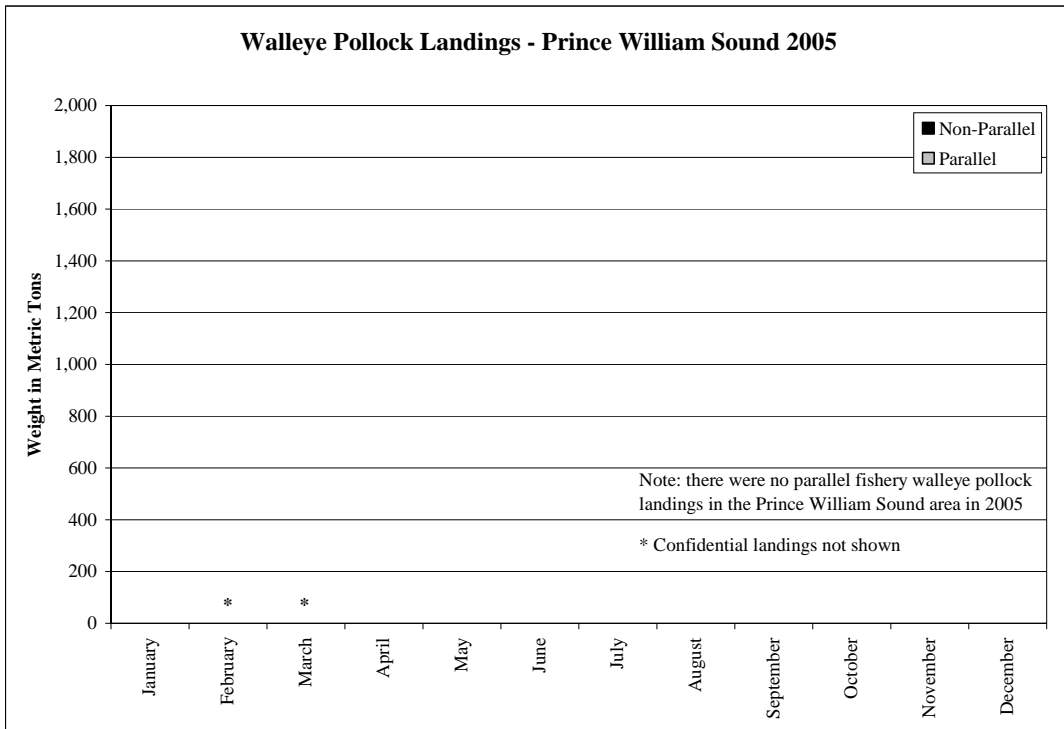




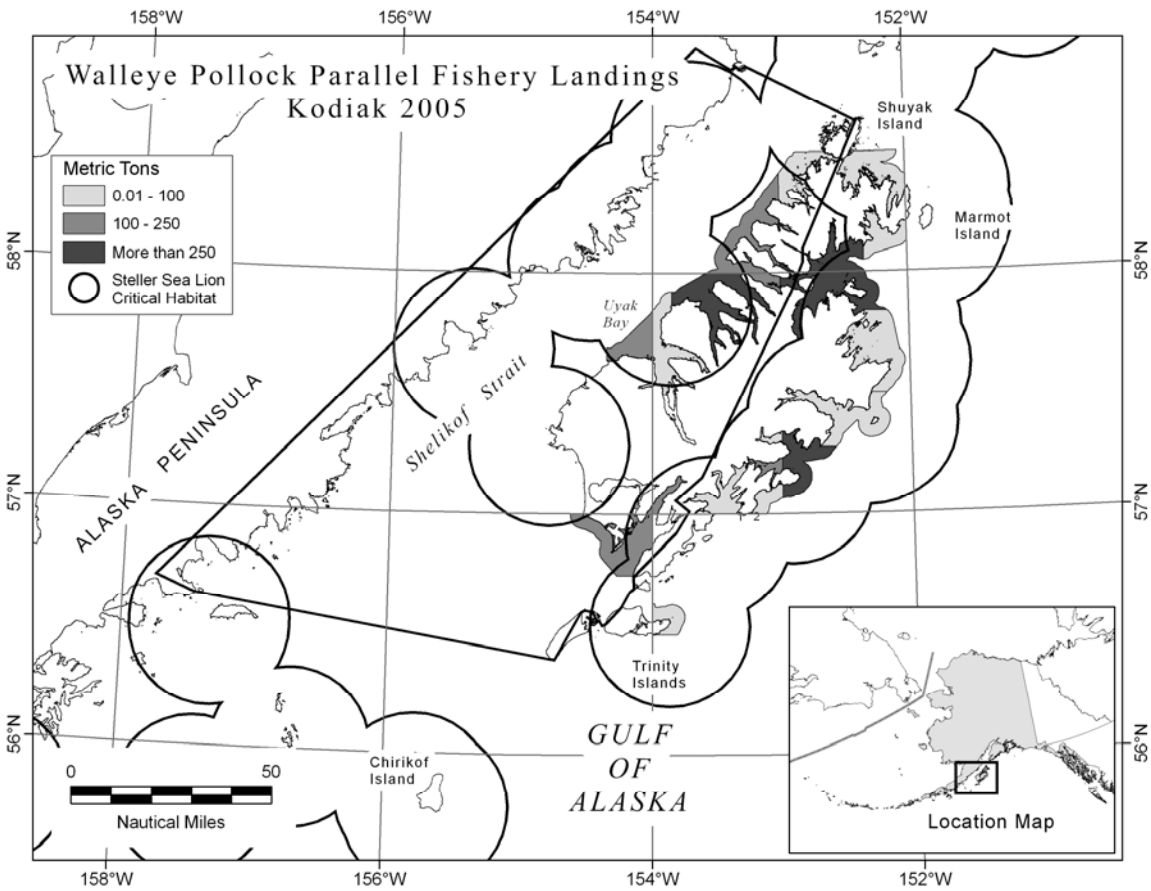
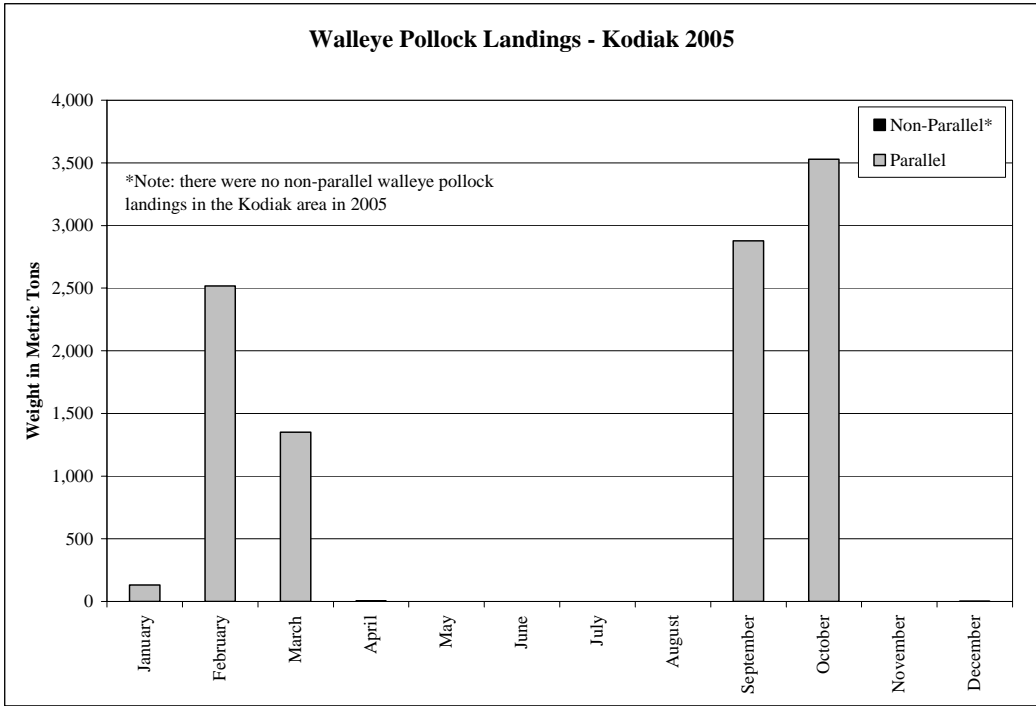
**Figure 4.12.** –Monthly distribution of Pacific cod landings in the western Aleutian Islands management area, 2006 (top), and spatial distribution of Pacific cod landings in the eastern and western Aleutian Islands, 2005 (above and below, respectively). \* indicates confidential landing.



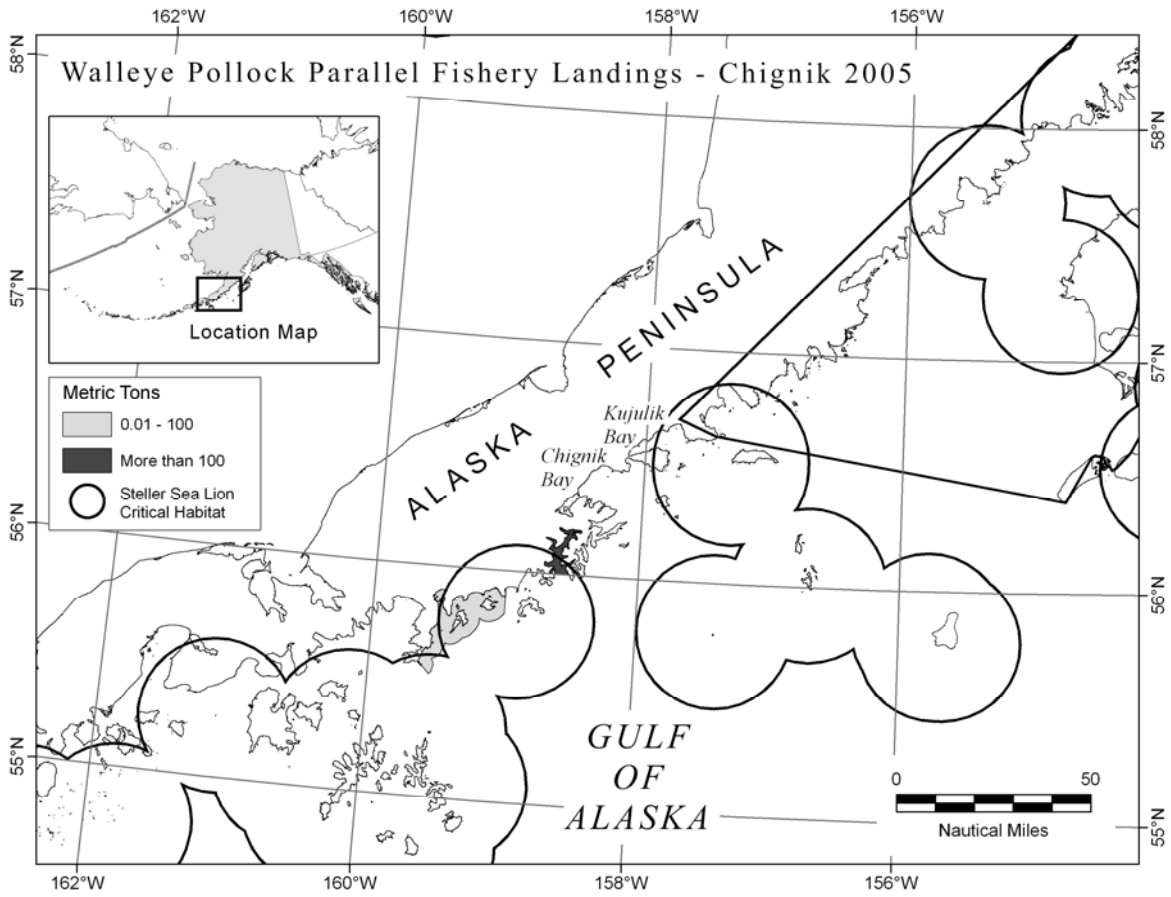
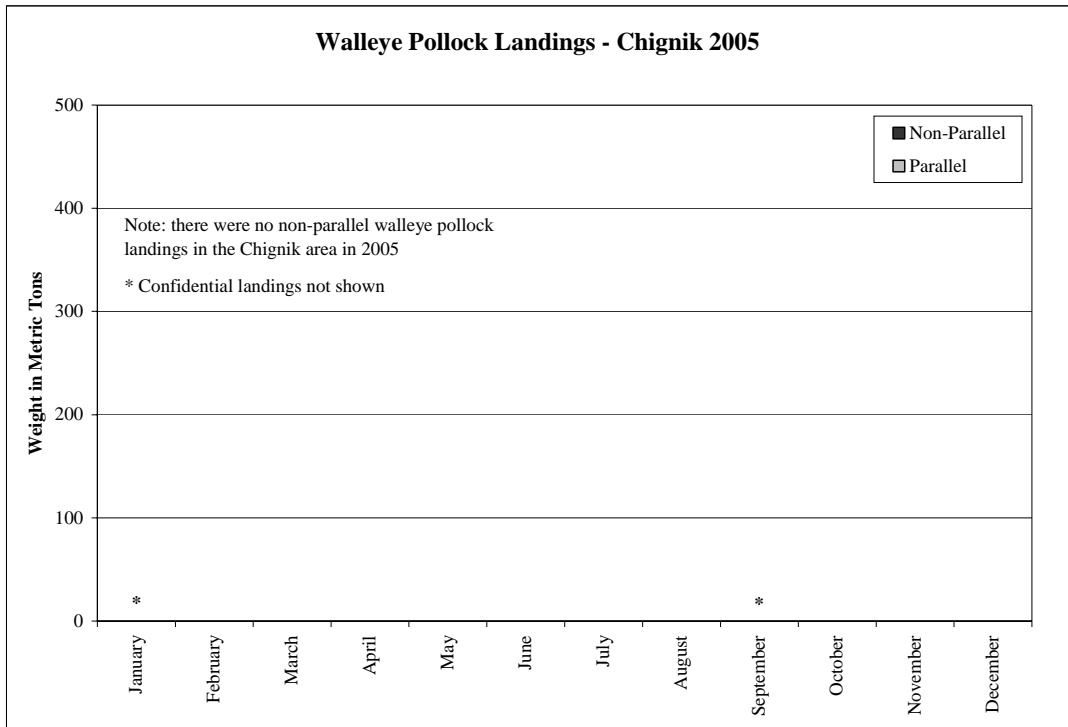
**Figure 4.13.**—Spatial distribution of Pacific cod landings in the Aleutian Islands management area, 2005.



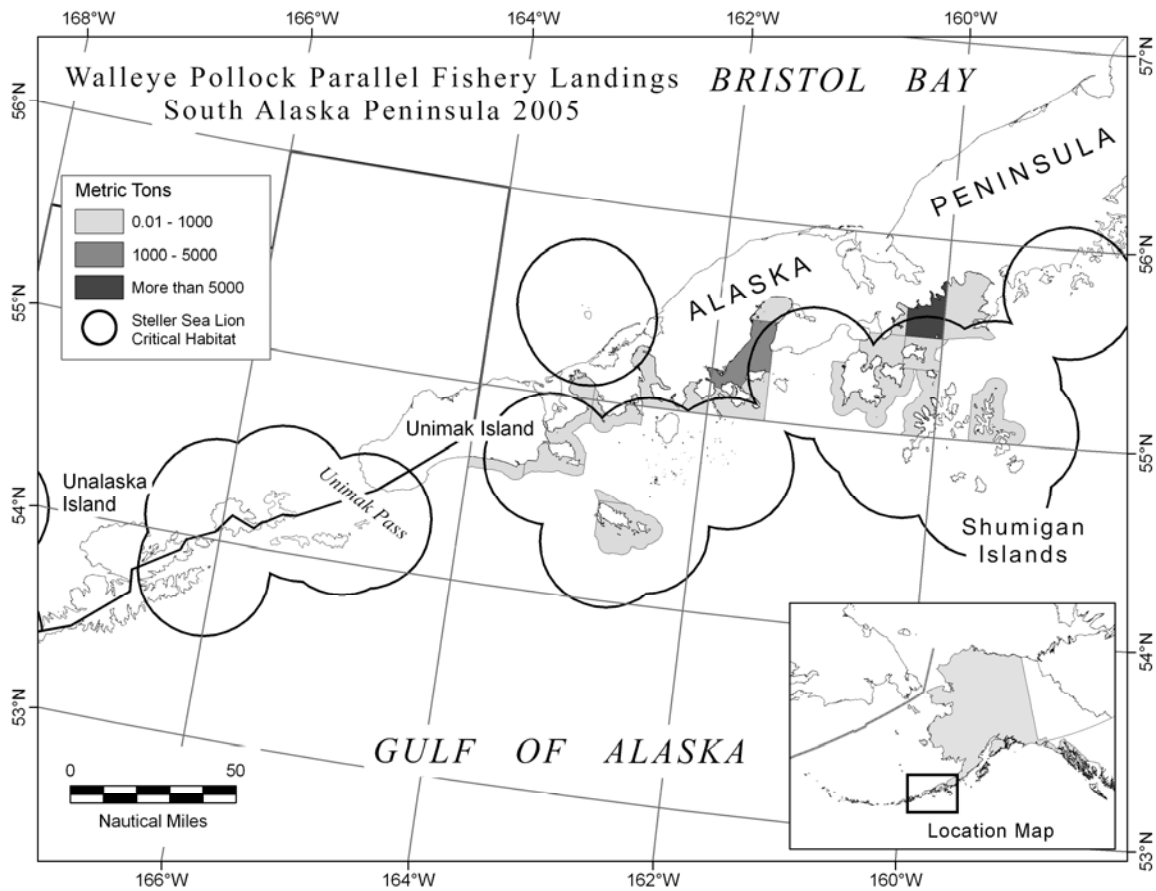
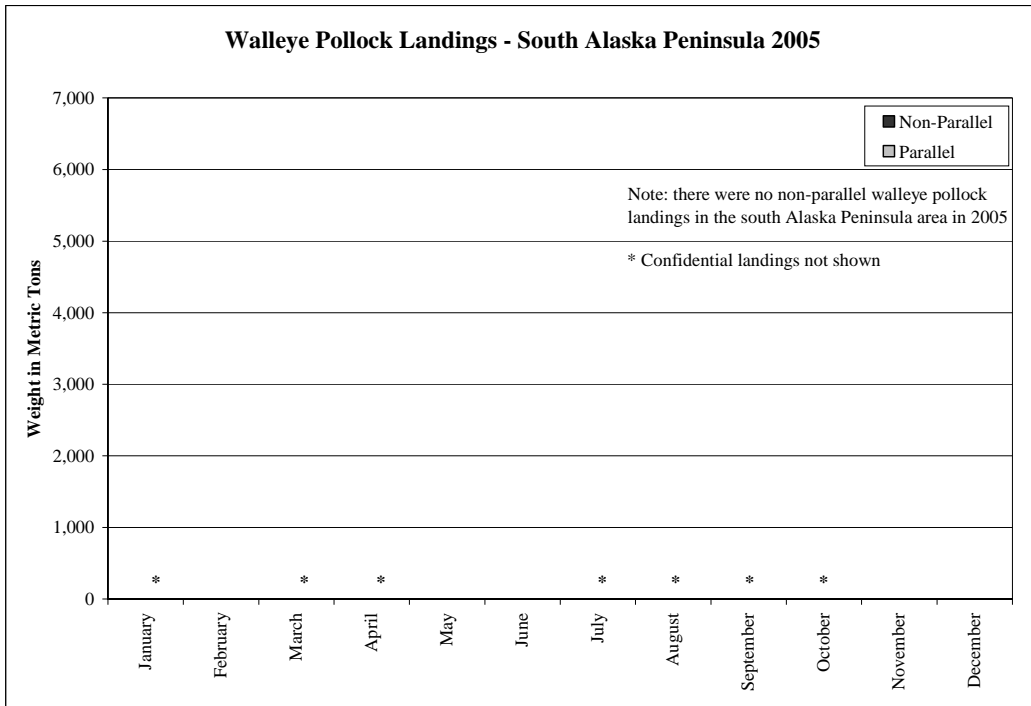
**Figure 4.14 (Historical Figure 7.6).**—Monthly distribution of walleye pollock landings in the Prince William Sound management area, 2005 (top), and spatial distribution of walleye pollock landings in the Prince William Sound management area, 2005 (bottom). \* indicates confidential landing.



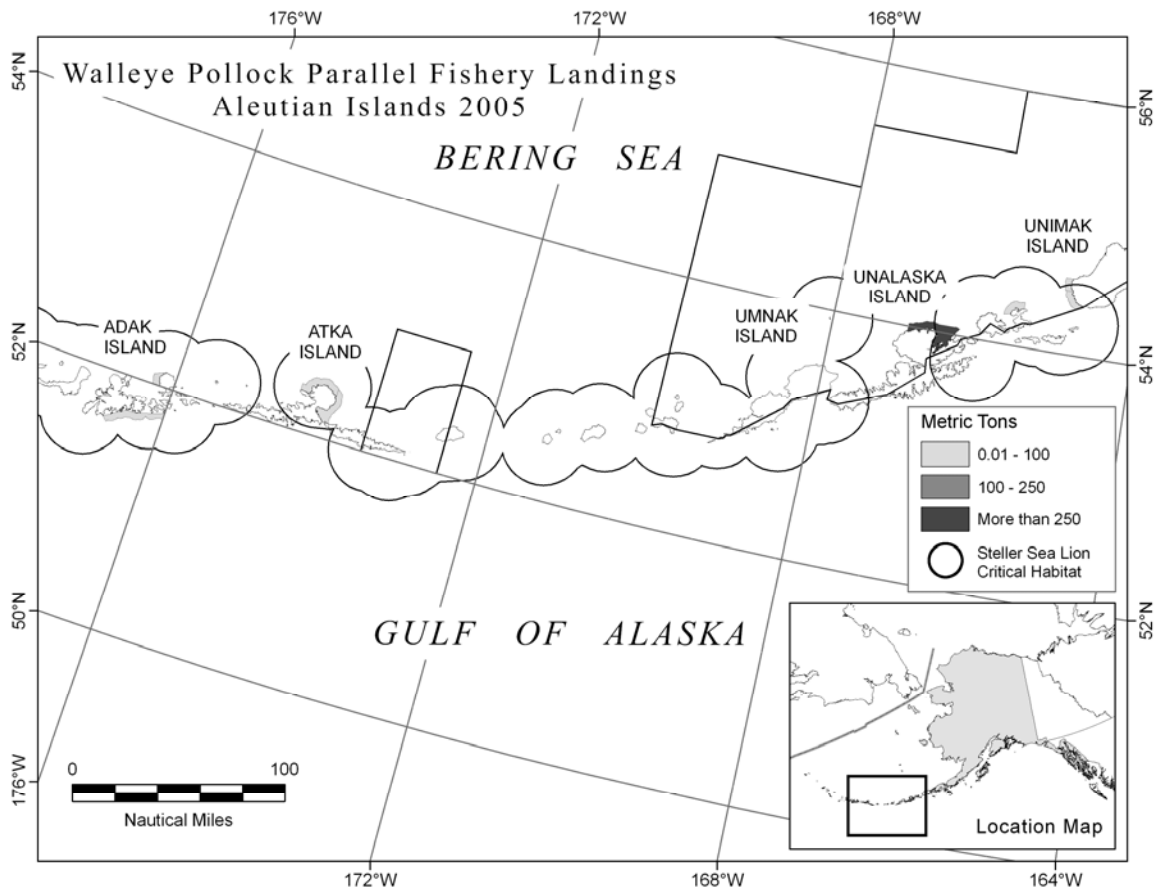
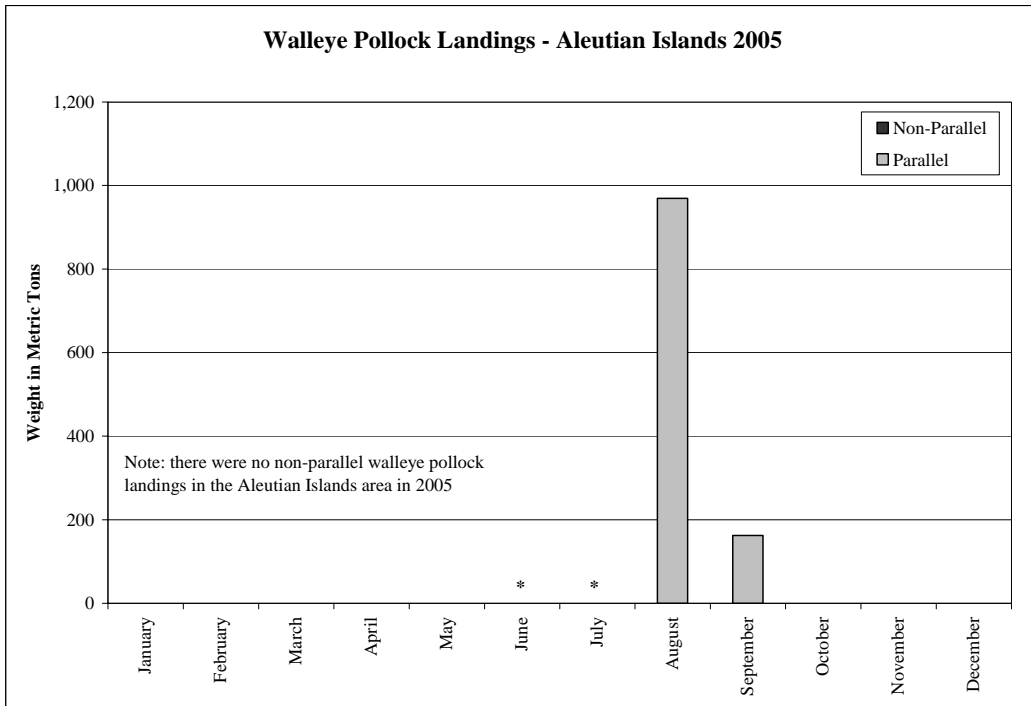
**Figure 4.15.**—Monthly distribution of walleye pollock parallel fishery landings in the Kodiak management area, 2005 (top), and spatial distribution of walleye pollock parallel fishery landings in the Kodiak management area, 2005 (bottom).



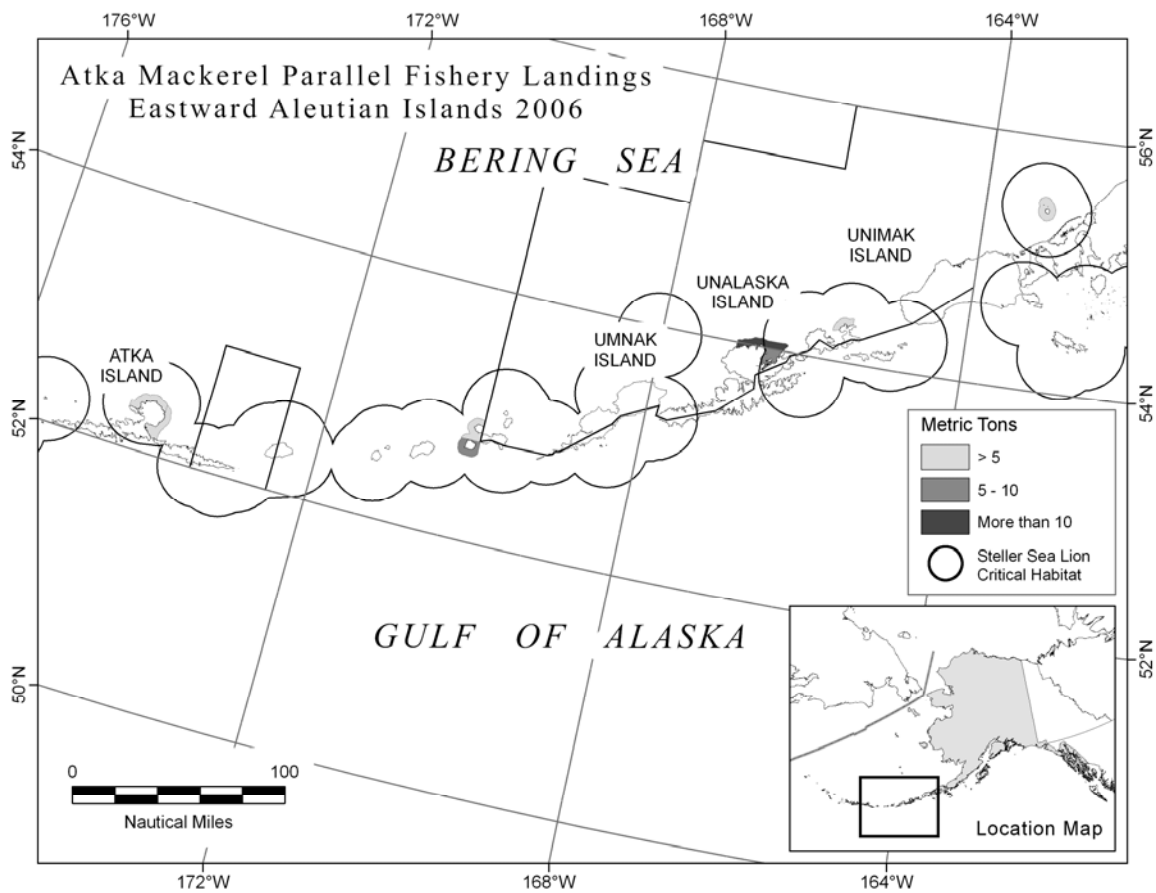
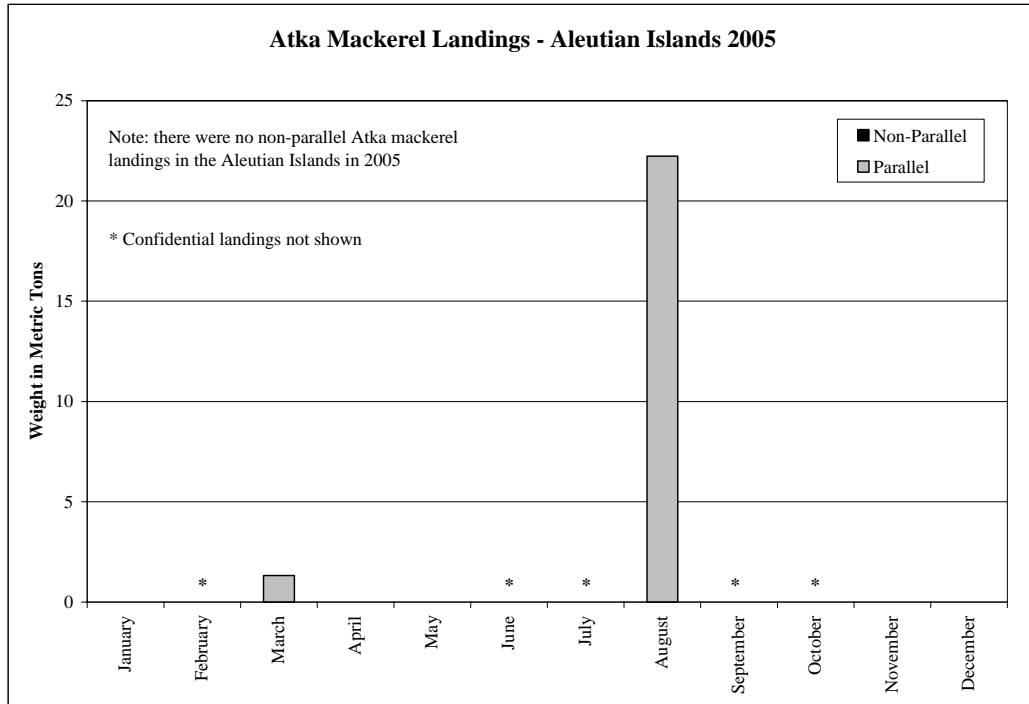
**Figure 4.16.**—Monthly distribution of walleye pollock parallel fishery landings in the Chignik management area, 2005 (top), and spatial distribution of walleye pollock parallel fishery landings in the Chignik management area, 2005 (bottom). \* indicates confidential landing.



**Figure 4.17.**—Monthly distribution of walleye pollock parallel fishery landings in the South Alaska Peninsula management area, 2005 (top), and spatial distribution of walleye pollock parallel fishery landings in the South Alaska Peninsula management area, 2005 (bottom). \* indicates confidential landing.

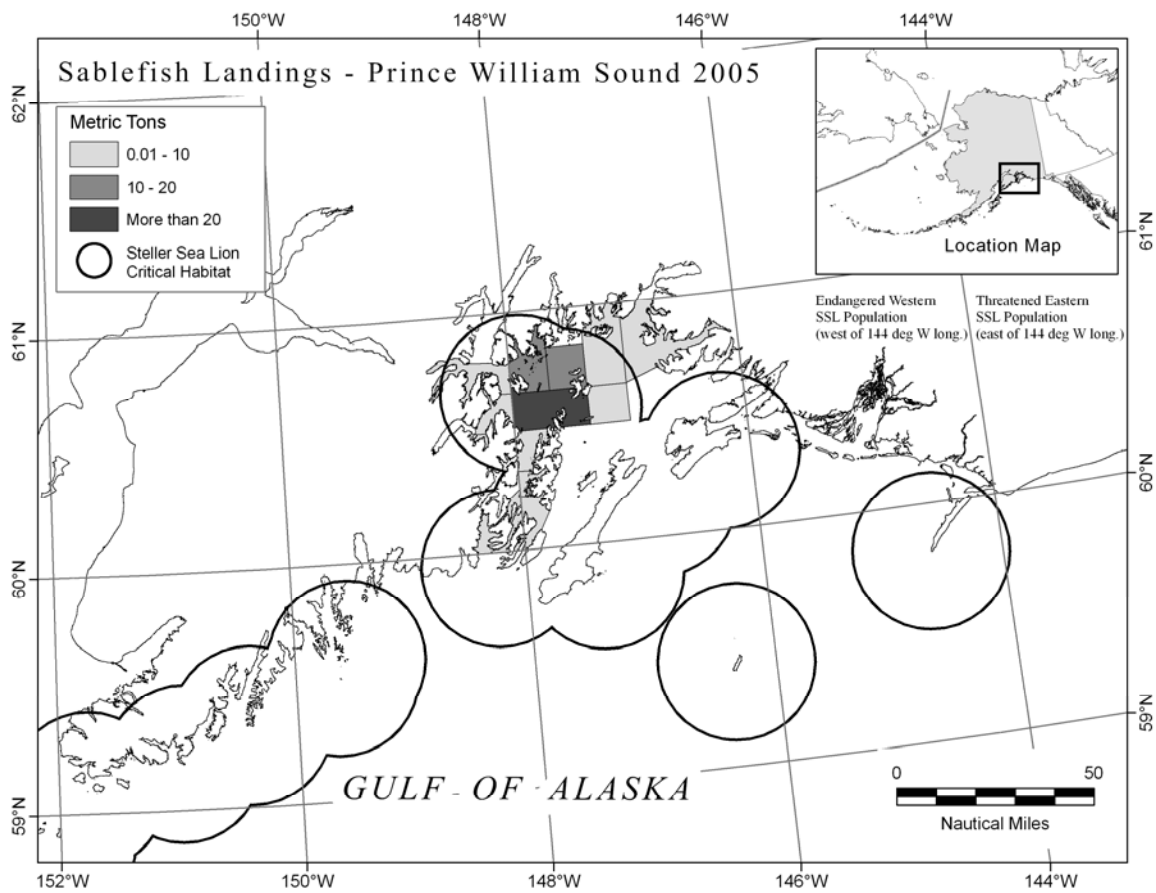
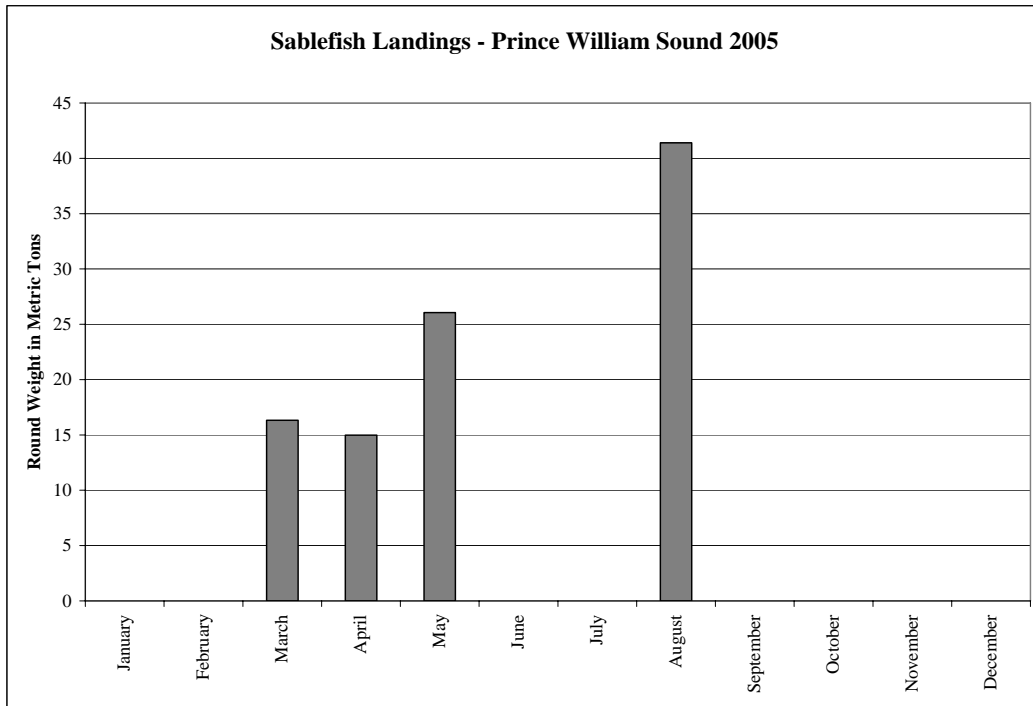


**Figure 4.18.** –Monthly distribution of walleye pollock parallel fishery landings in the Aleutian Islands management area, 2005 (top), and spatial distribution of walleye pollock parallel fishery landings in the Aleutian Islands management area, 2005 (bottom). \* indicates confidential landing.

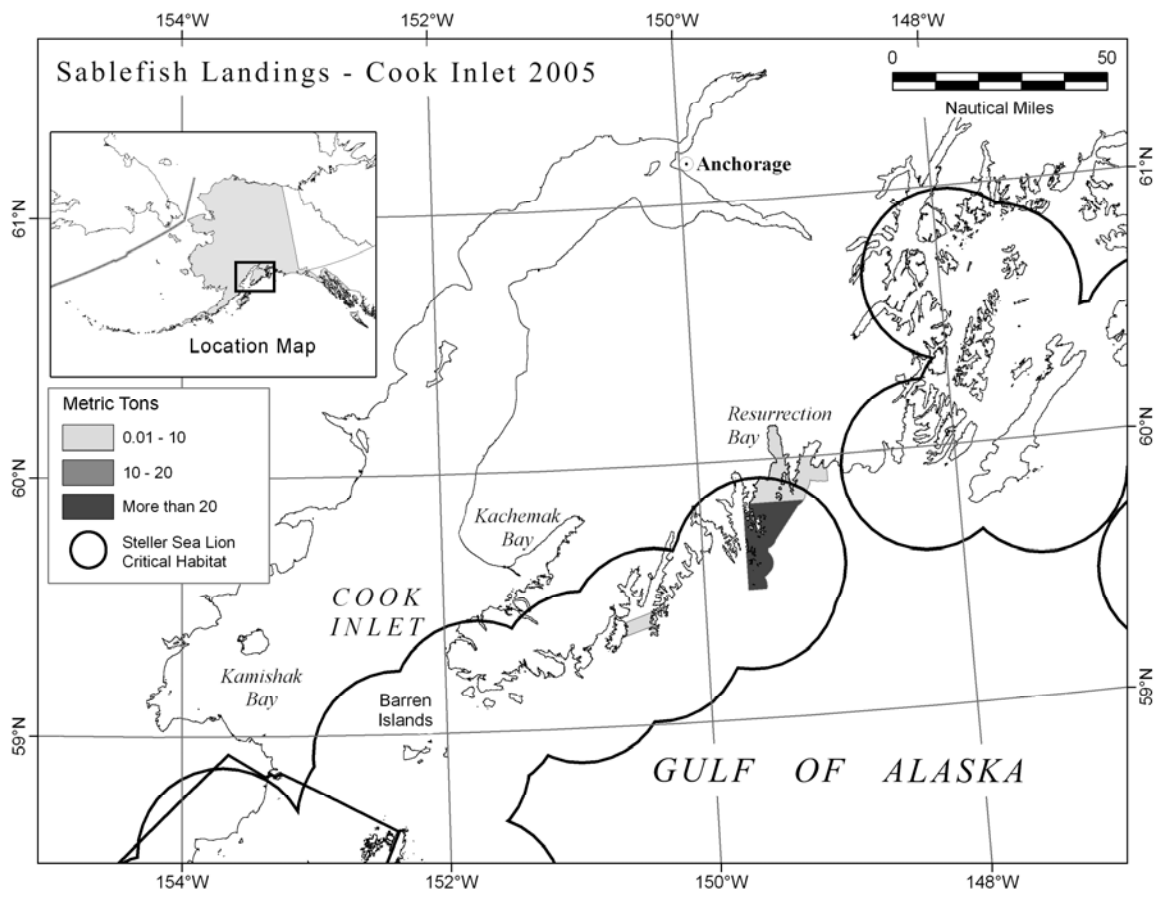
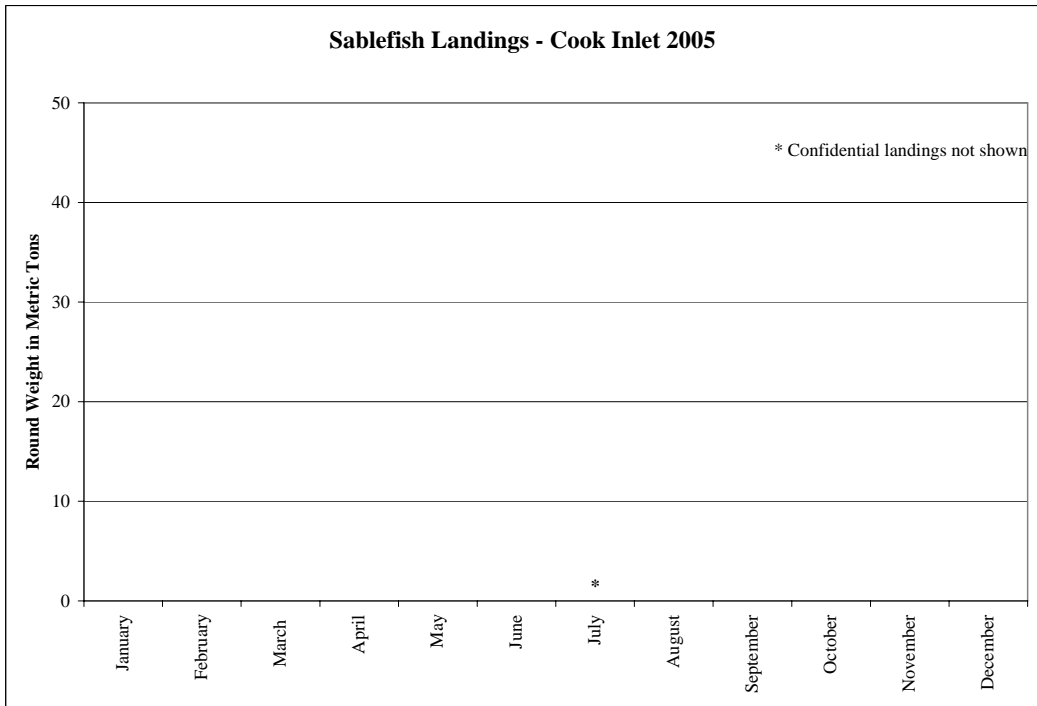


**Figure 4.19 (Historical Figure 7.19).**—Monthly distribution of Atka mackerel parallel fishery landings in the Bering Sea/Aleutian Islands management area, 2005 (top), and spatial distribution of Atka mackerel parallel fishery landings in the Bering Sea/Aleutian Islands management area, 2005 (bottom). \* indicates confidential catch.

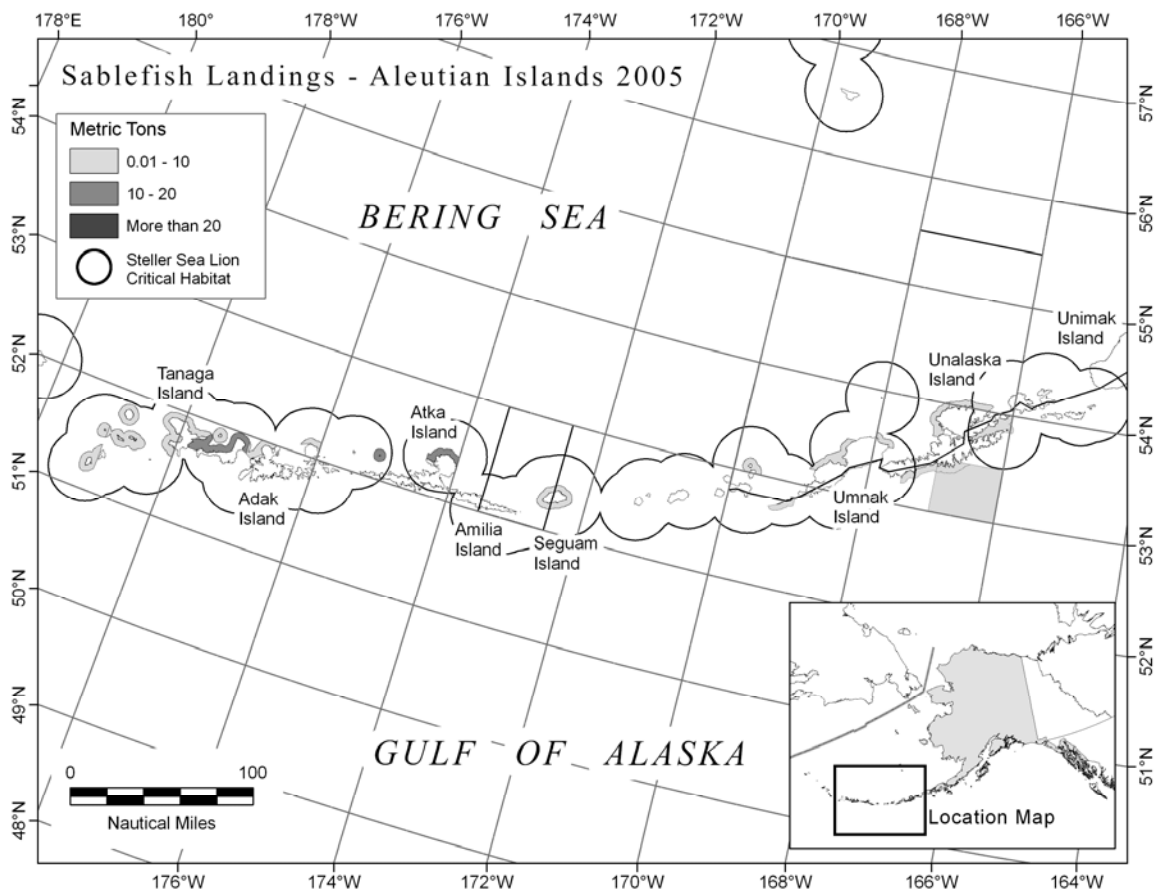
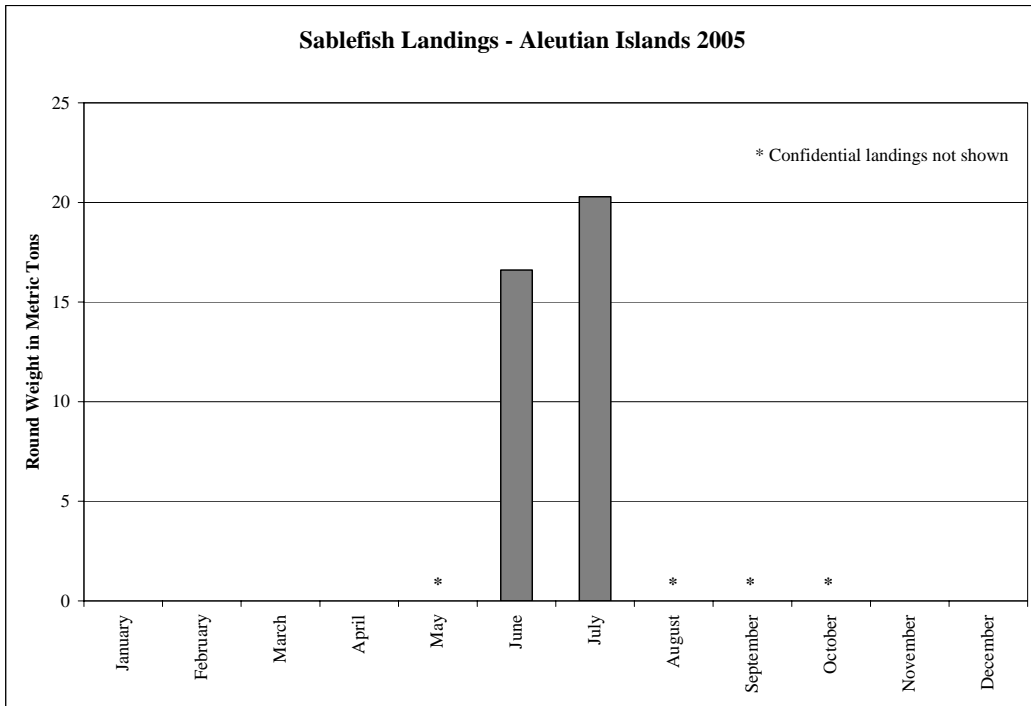




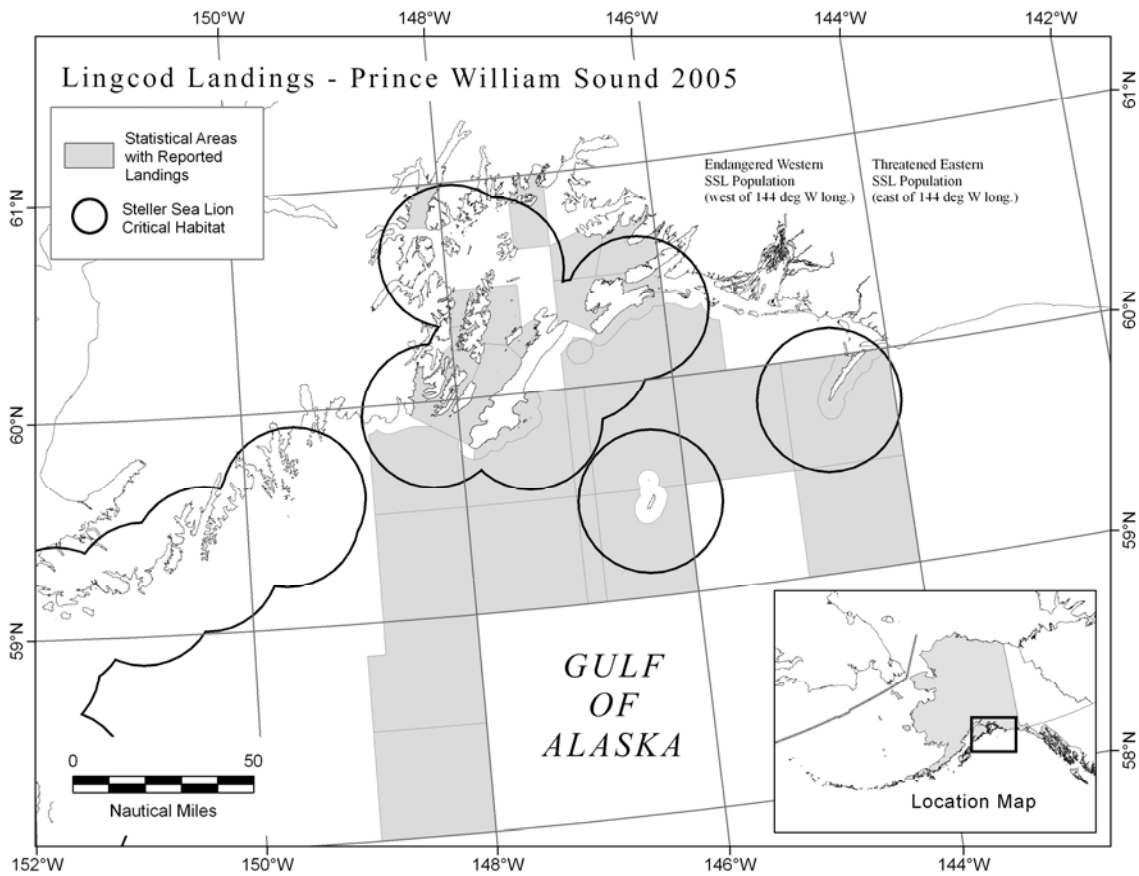
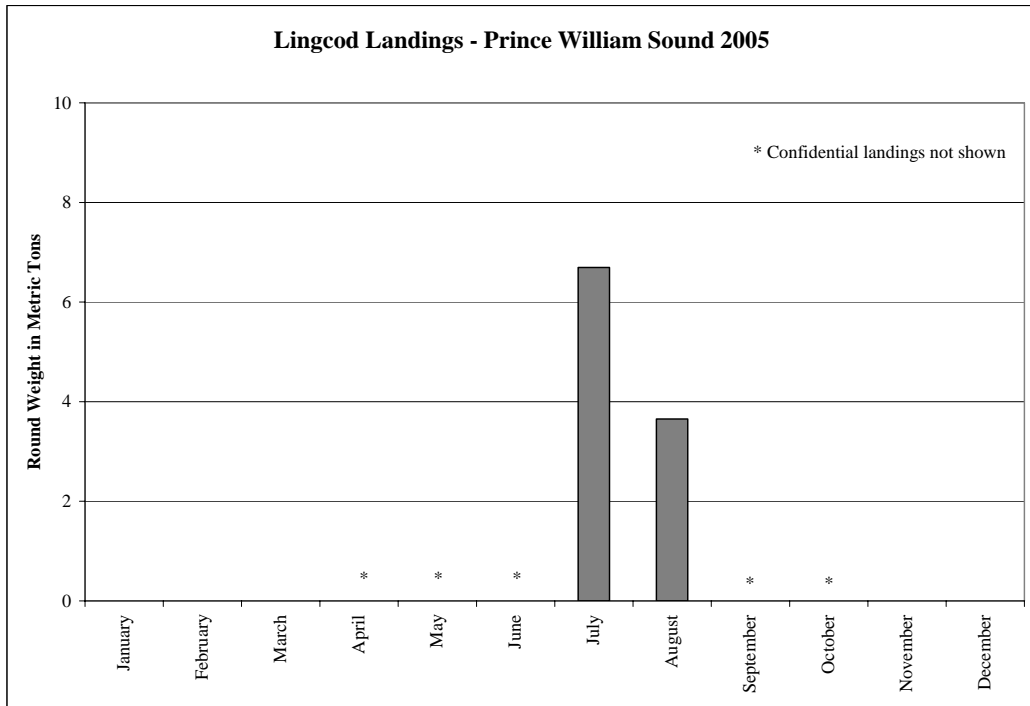
**Figure 4.20 (Historical Figure 7.7).**—Monthly distribution of sablefish landings in the Prince William Sound management area, 2005, and spatial distribution of sablefish landings in the Prince William Sound management area, 2005 (bottom).



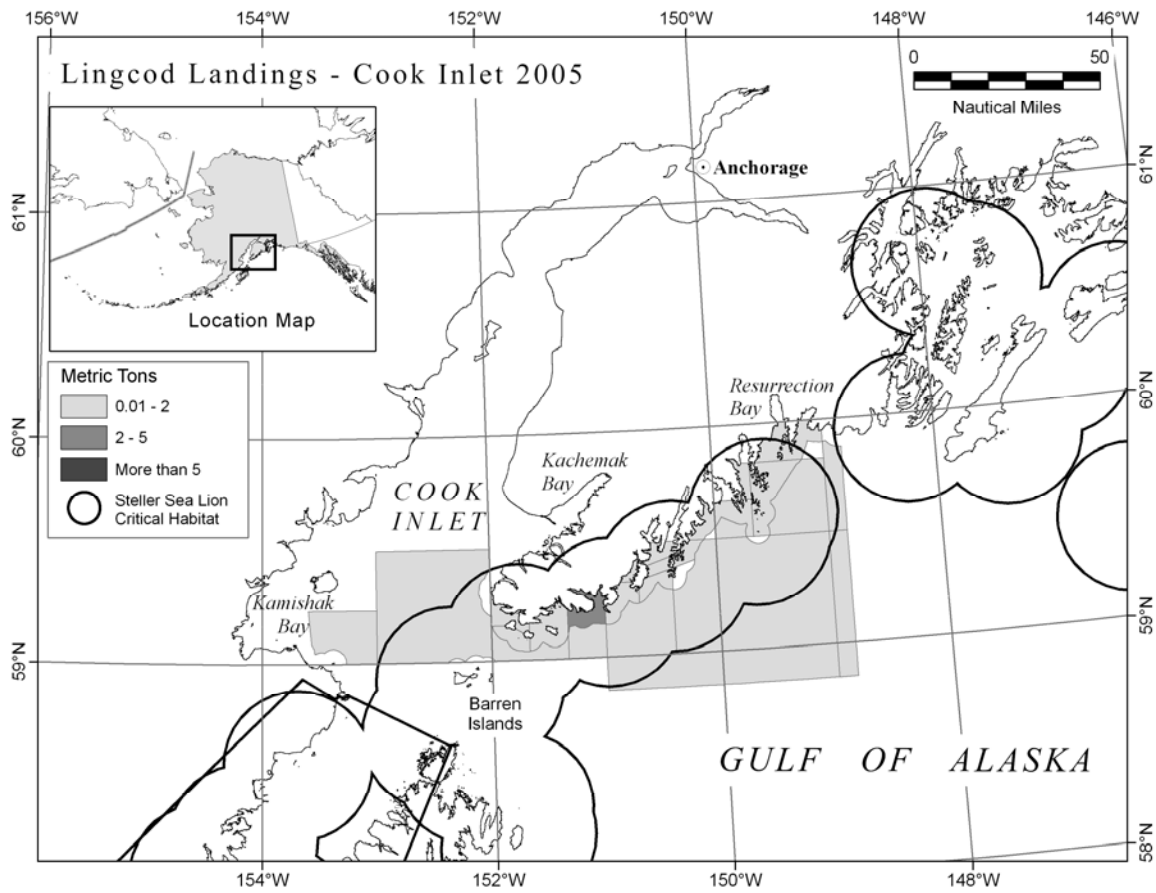
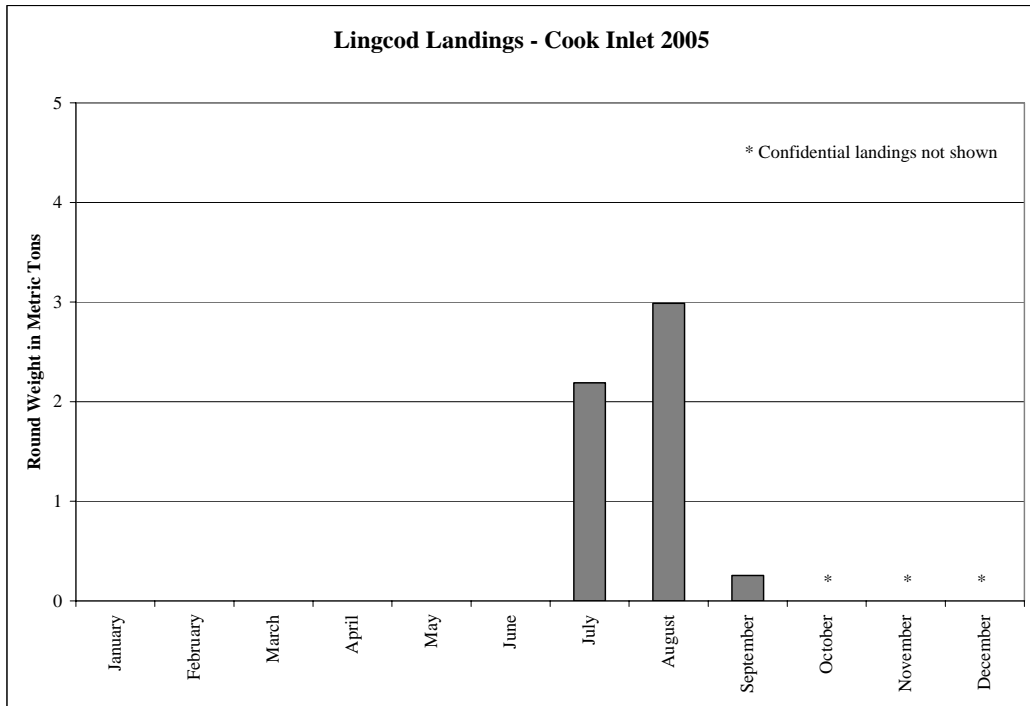
**Figure 4.21 (Historical Figure 7.8).**—Monthly distribution of sablefish landings in the Cook Inlet management area, 2005 (top), and spatial distribution of sablefish landings in the Cook Inlet management area, 2005 (bottom). Note the increase in y-axis scale: 0–20 mt in 1999, 0–40 mt in 2005. \* indicates confidential catch.



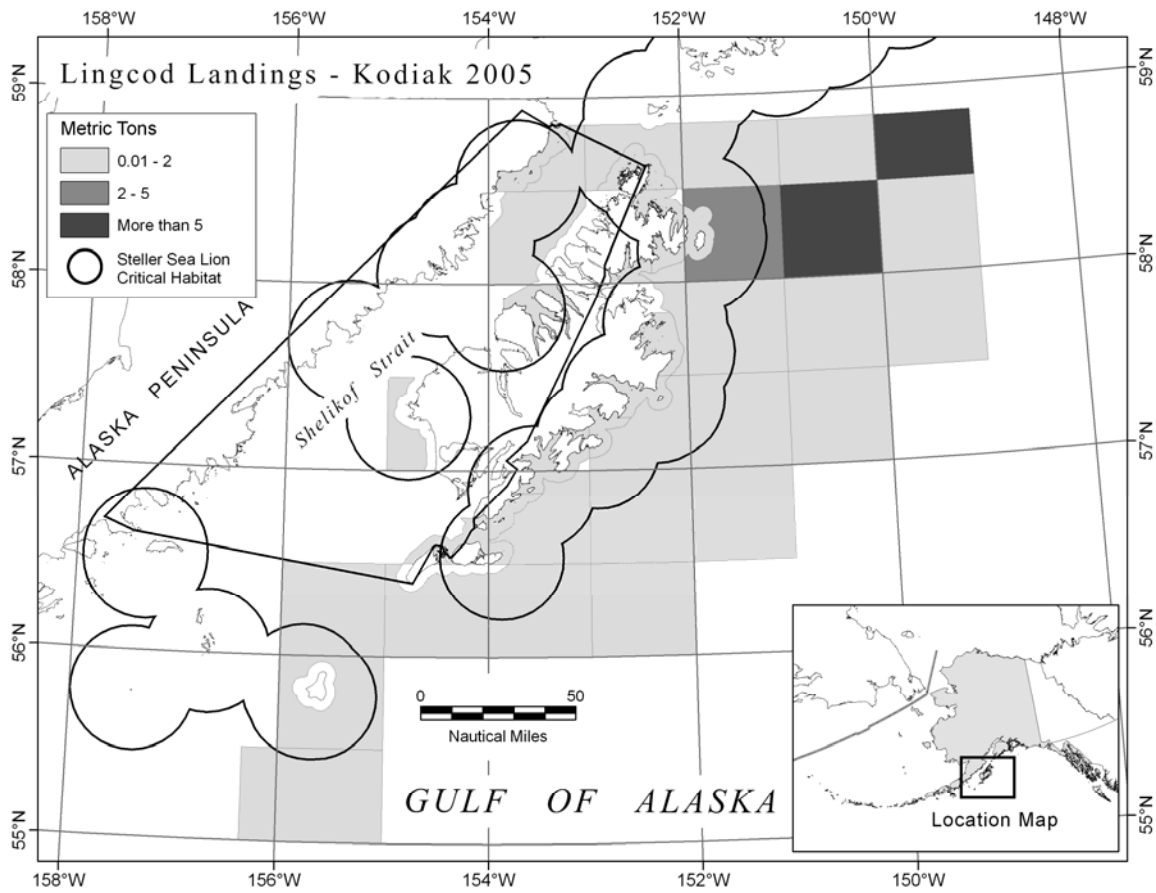
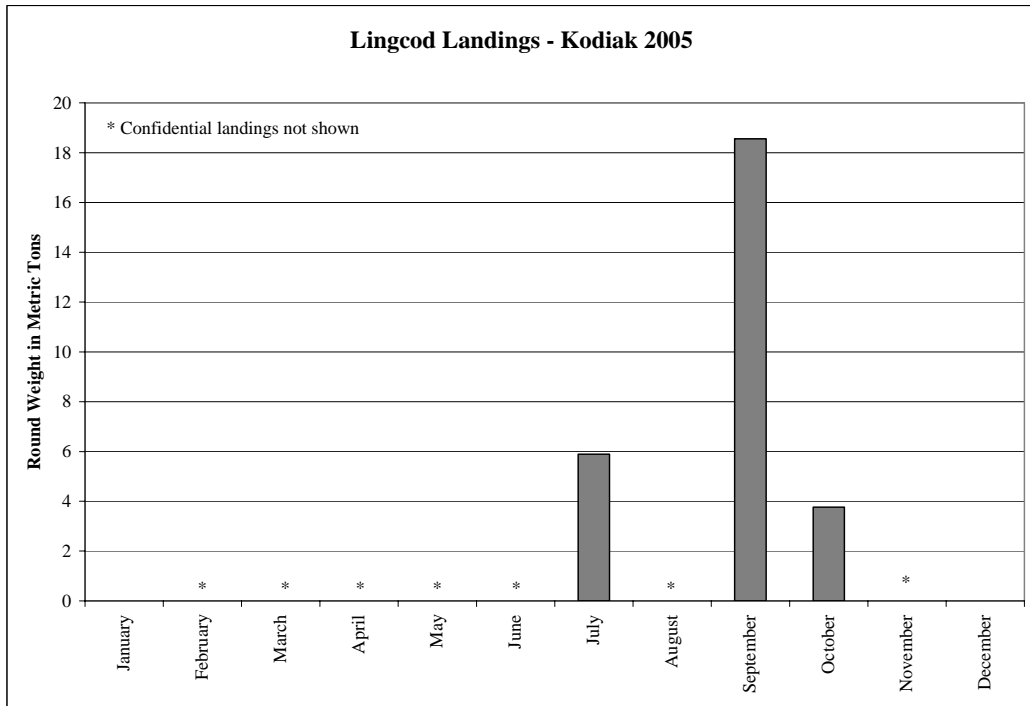
**Figure 4.22 (Historical Figure 7.9).**—Monthly distribution of sablefish landings in the Aleutian Islands management area, 2005 (top), and spatial distribution of sablefish landings in the Aleutian Islands management area, 2005 (bottom). \* indicates confidential catch.



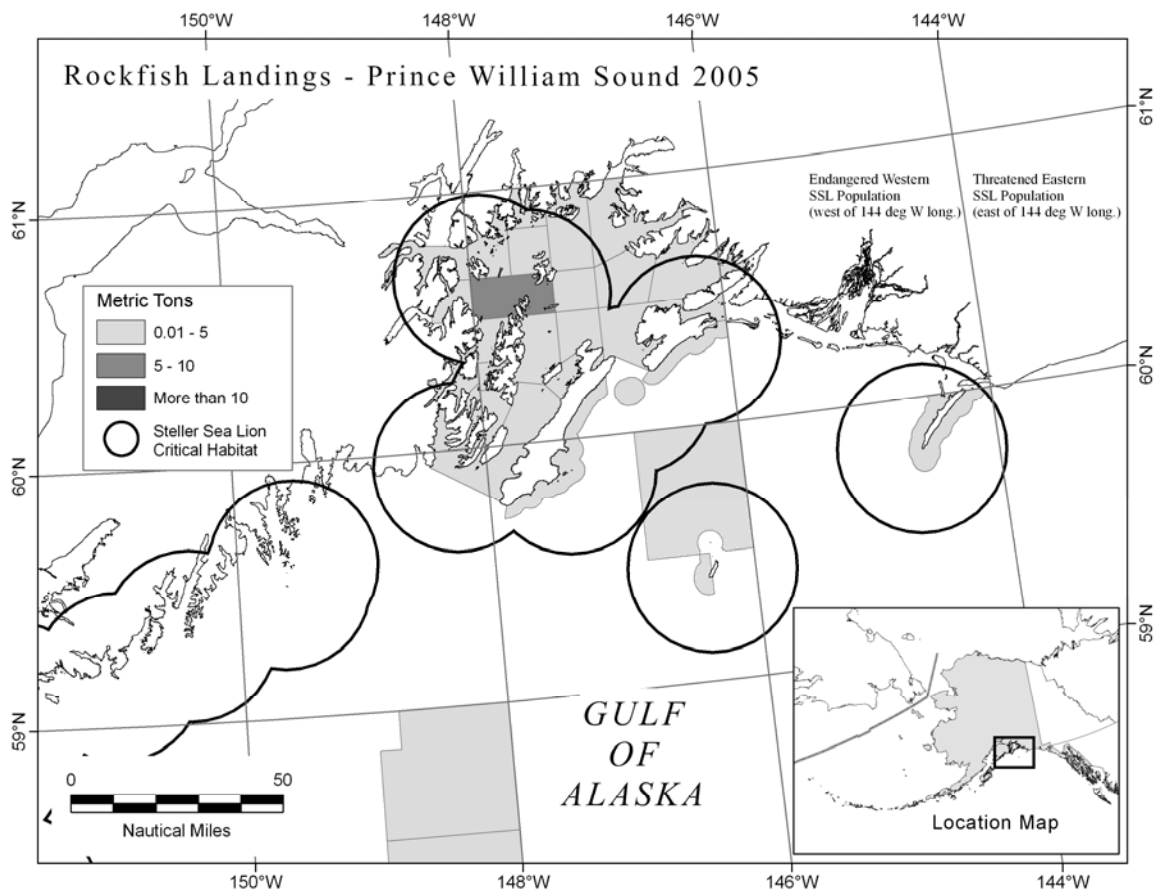
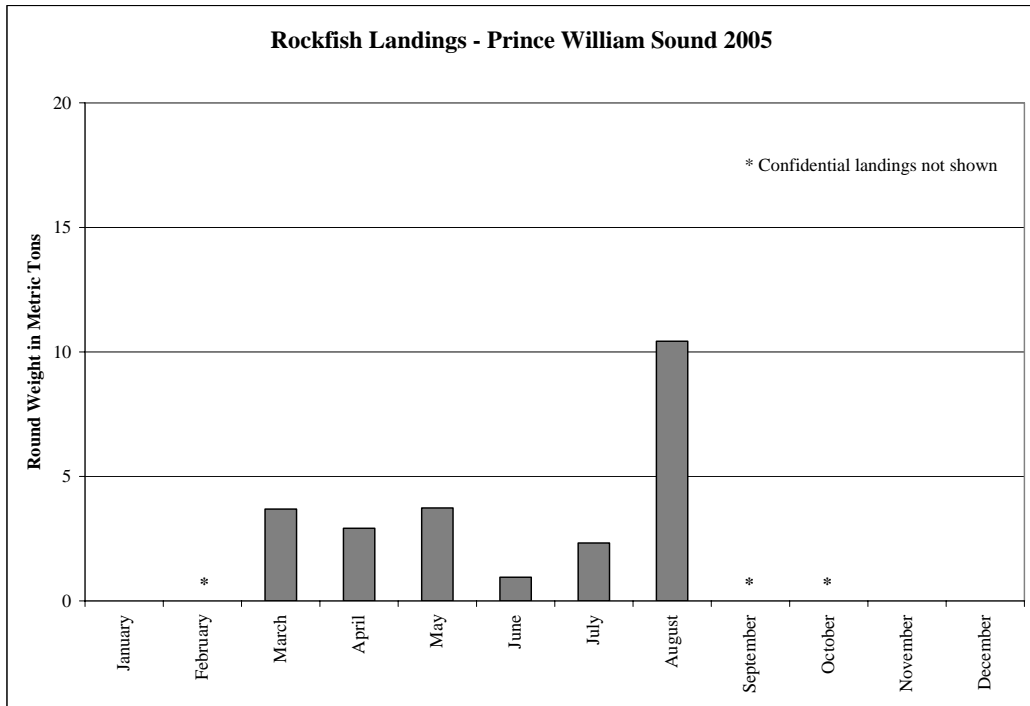
**Figure 4.23 (Historical Figure 7.10).**—Monthly distribution of Lingcod landings in the Prince William Sound management area, 2005 (top), and Spatial distribution of Lingcod landings in the Prince William Sound management area, 2005 (bottom). Note the increase in y-axis scale: 0–5 mt in 1999, 0–8 mt in 2005. \* indicates confidential catch.



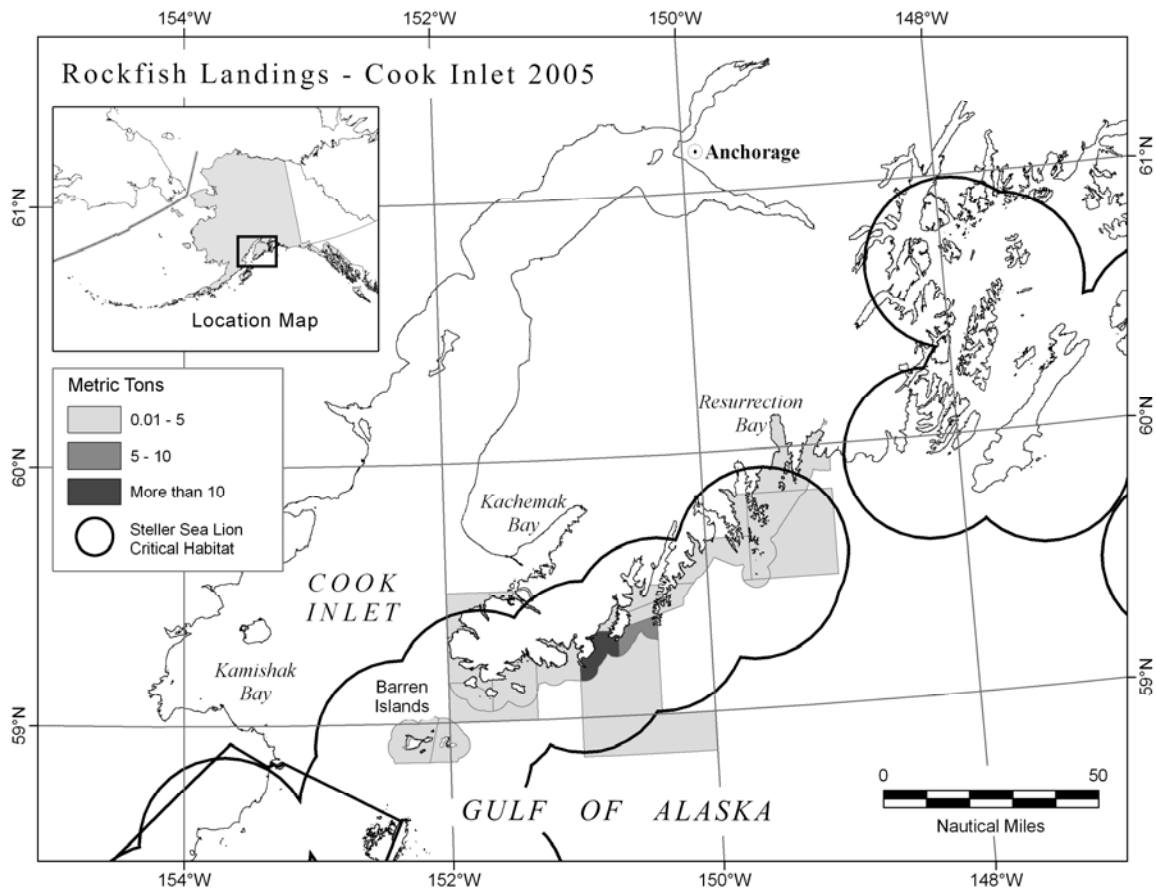
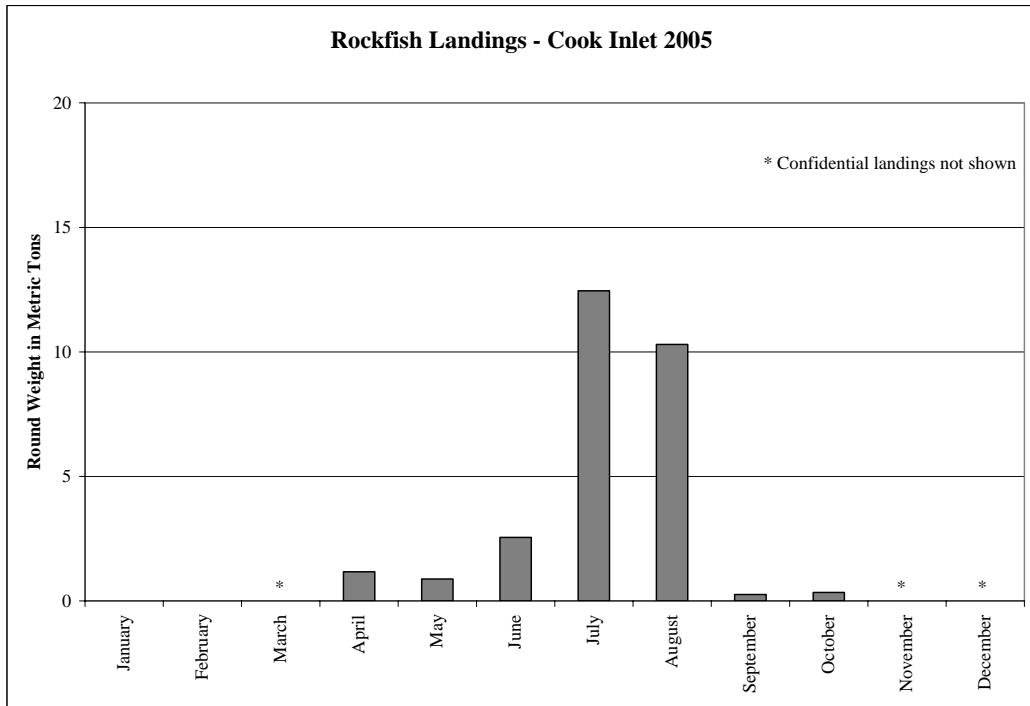
**Figure 4.24 (Historical Figure 7.11).**—Monthly distribution of Lingcod landings in the Cook Inlet management area, 2005 (top), and Spatial distribution of Lingcod landings in the Cook Inlet management area, 2005 (bottom). \* indicates confidential catch.



**Figure 4.25 (Historical Figure 7.12).**—Monthly distribution of Lingcod landings in the Kodiak management area, 2005 (top), and Spatial distribution of Lingcod landings in the Kodiak management area, 2005 (bottom). Note the increase in y-axis scale: 0–5 mt in 1999, 0–20 mt in 2005. \* indicates confidential catch.

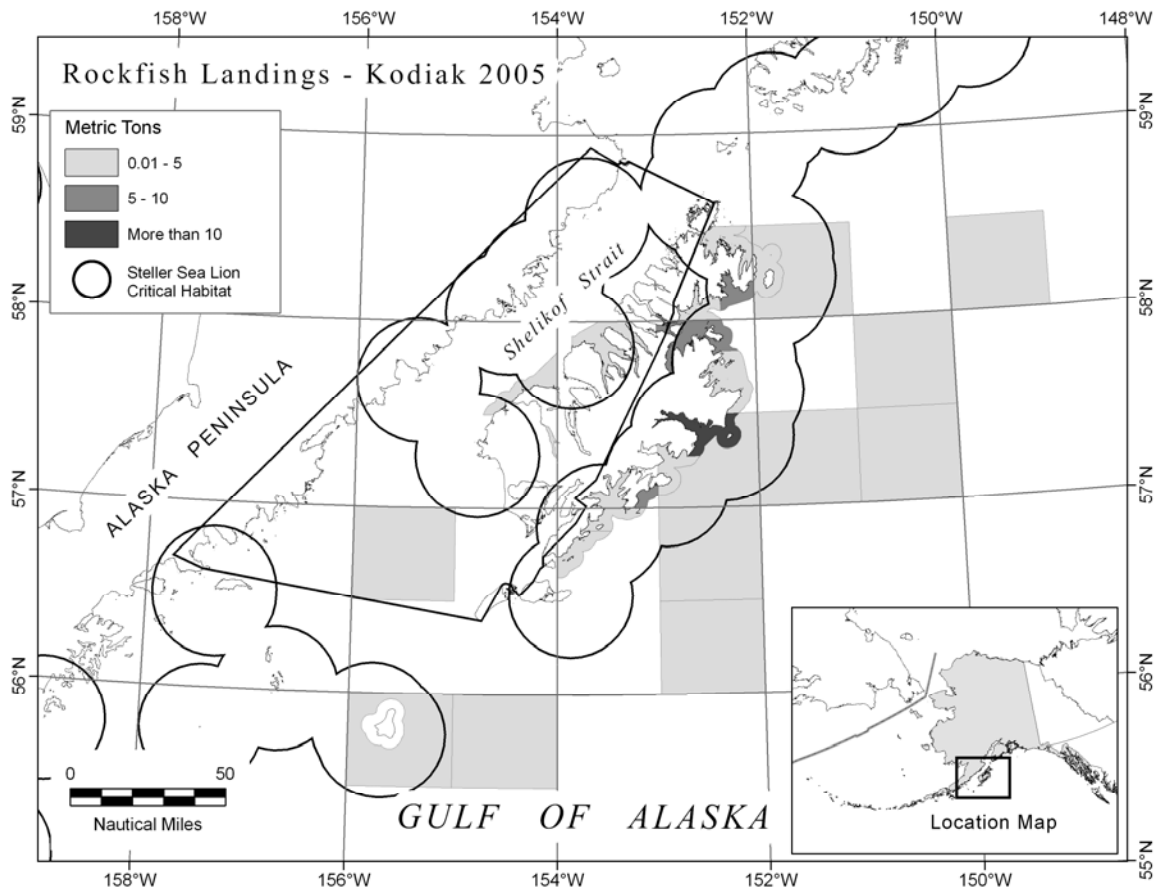
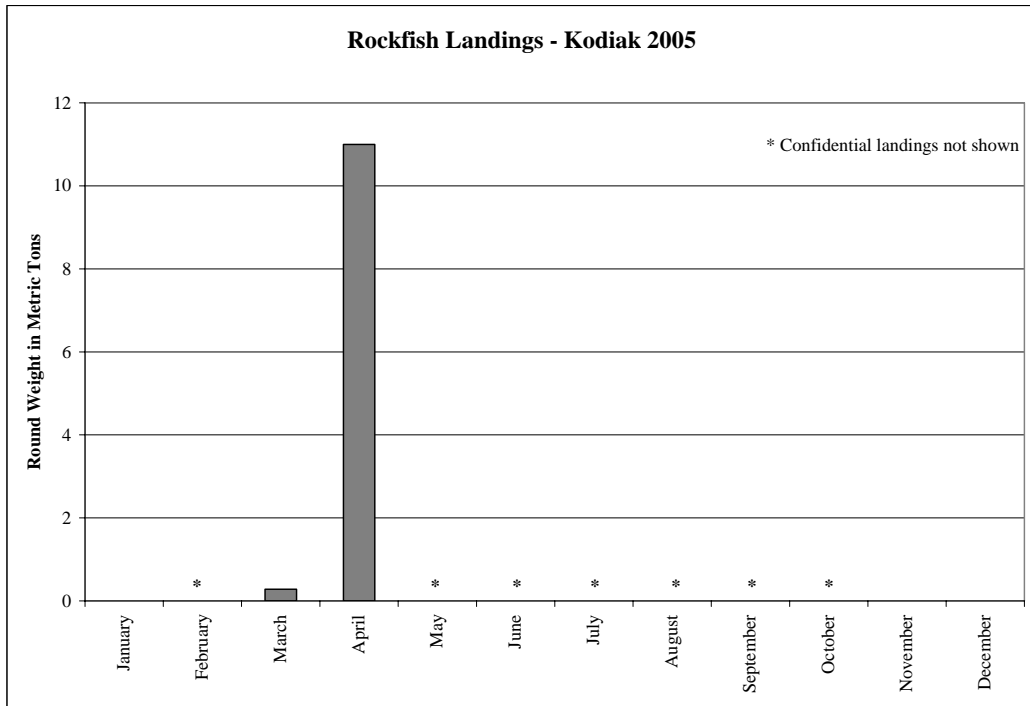


**Figure 4.26 (Historical Figure 7.13).**—Monthly distribution of rockfish landings in the Prince William Sound management area, 2005 (top), and spatial distribution of rockfish landings in the Prince William Sound management area, 2005 (bottom). \* indicates confidential catch.

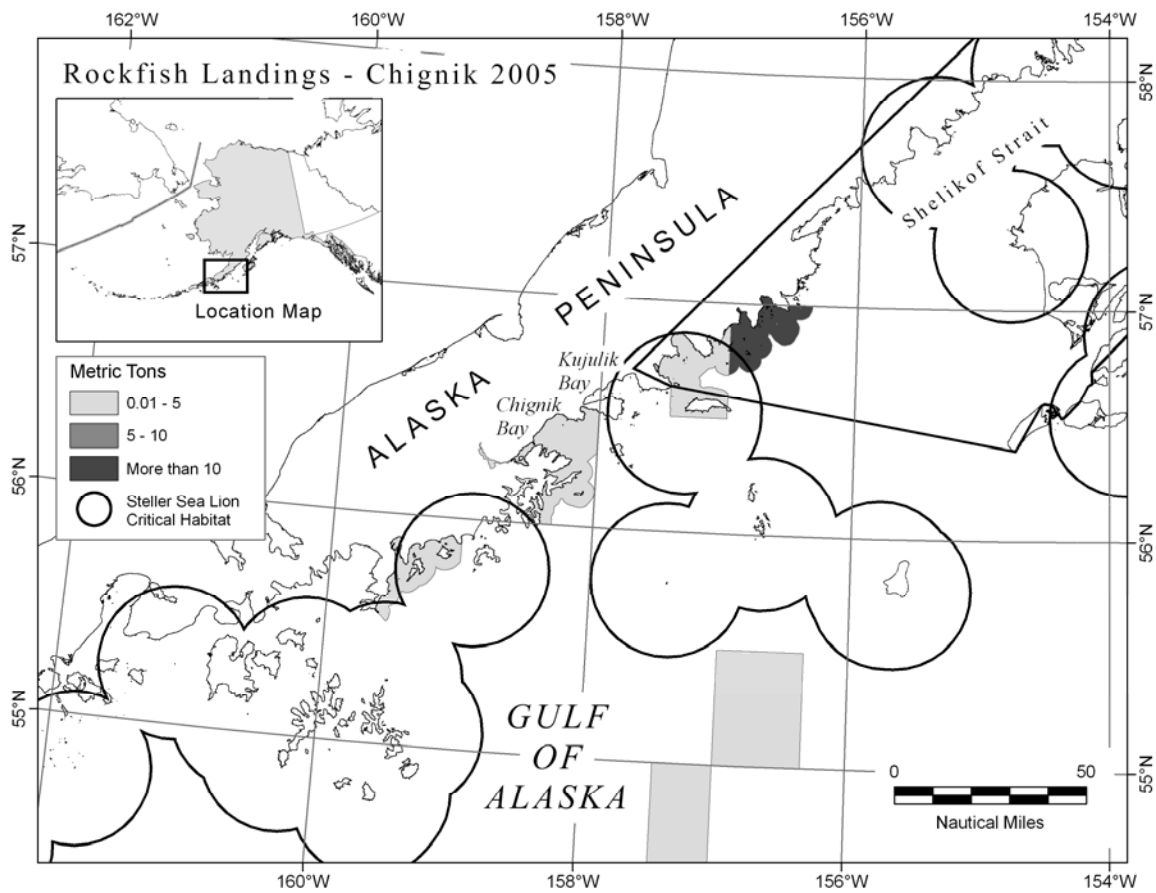
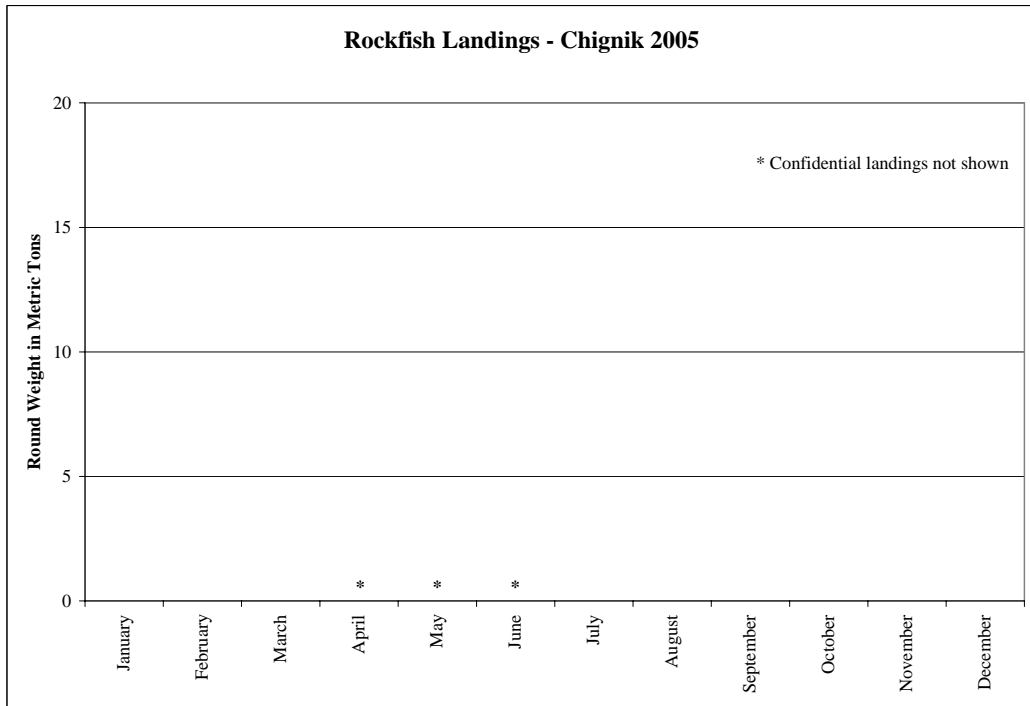


**Figure 4.27 (Historical Figure 7.14).**—Monthly distribution of rockfish landings in the Cook Inlet management area, 2005 (top), and spatial distribution of rockfish landings in the Cook Inlet management area, 2005 (bottom). \* indicates confidential catch.

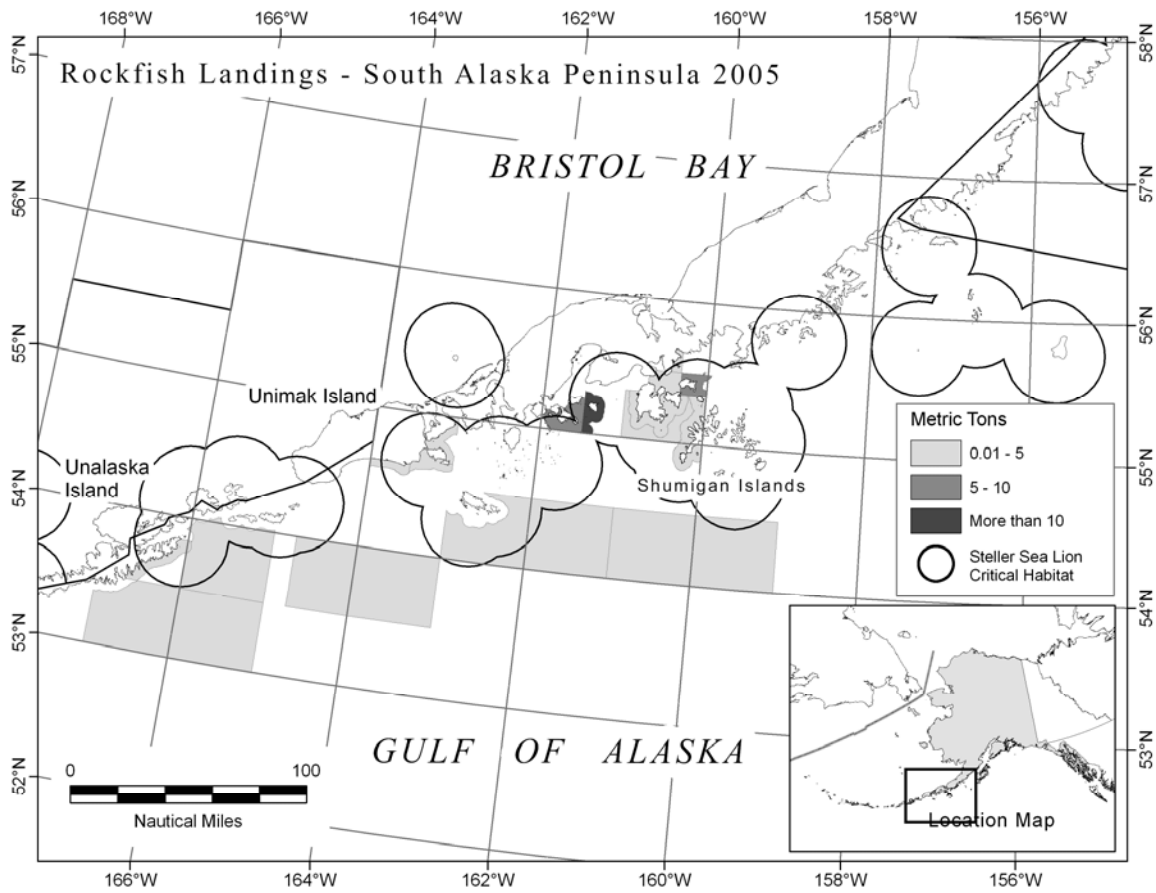
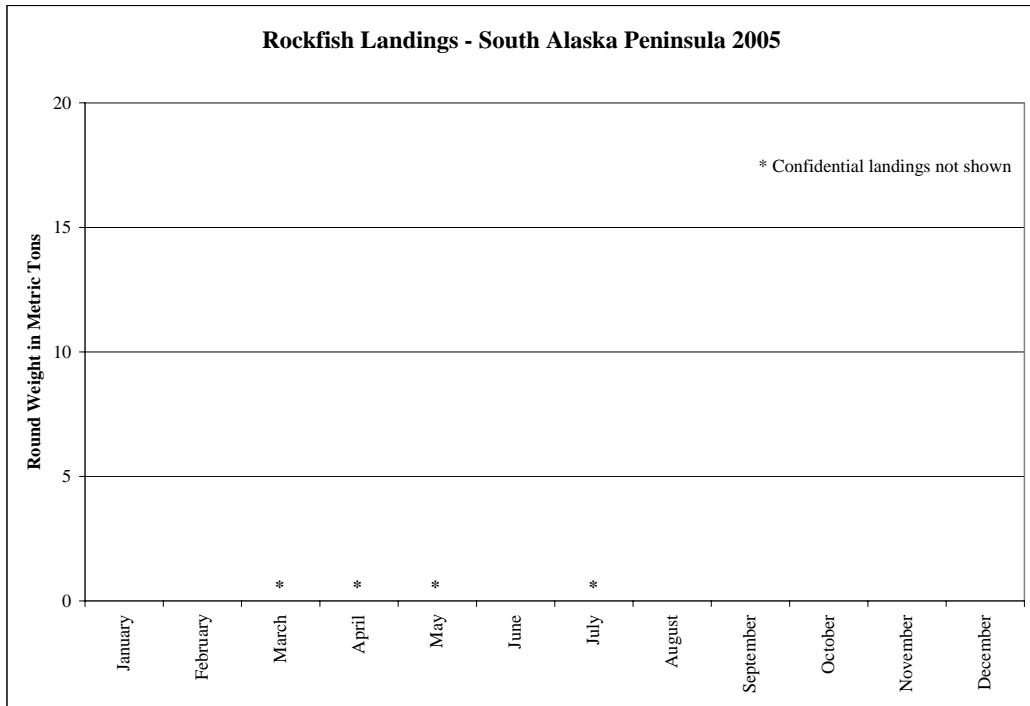




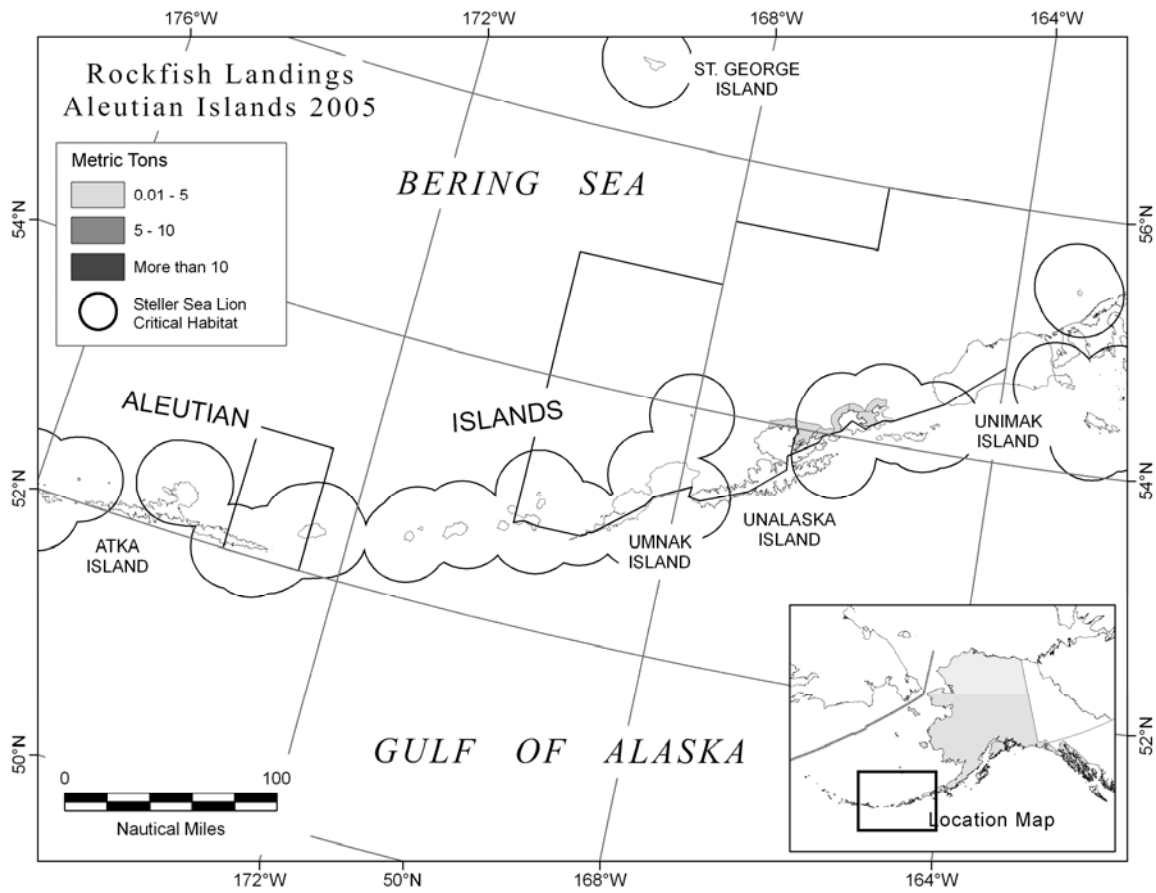
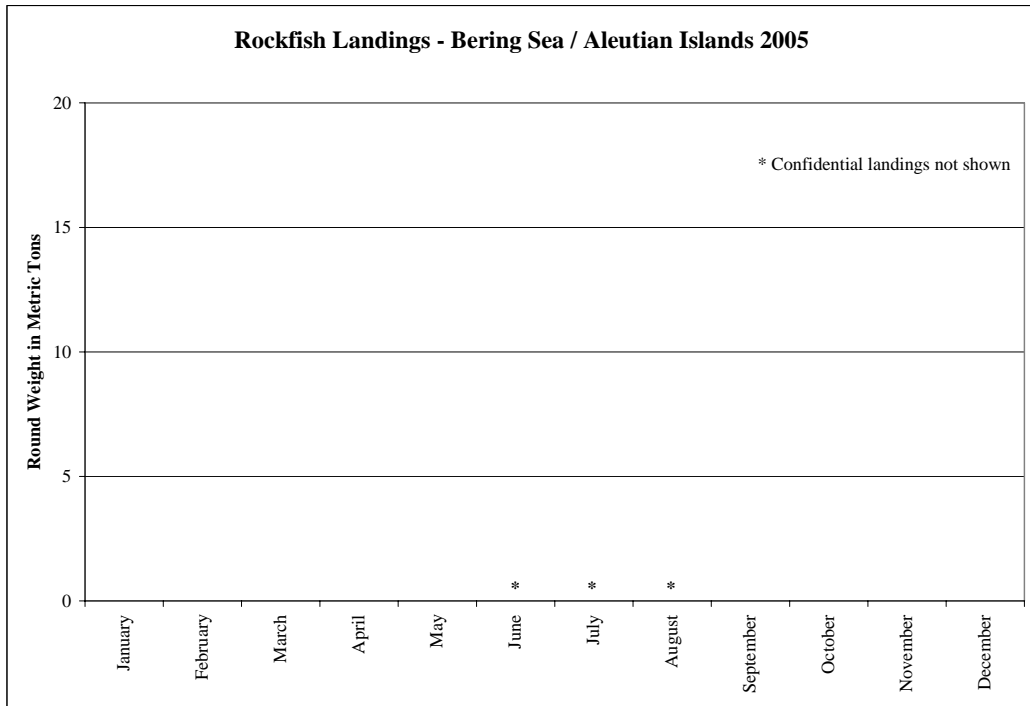
**Figure 4.28 (Historical Figure 7.15).**—Monthly distribution of Black Rockfish landings in the Kodiak management area, 2005 (top), and spatial distribution of Black Rockfish landings in the Kodiak management area, 2005 (bottom). \* indicates confidential catch.



**Figure 4.29 (Historical Figure 7.16).**—Monthly distribution of Black Rockfish landings in the Chignik management area, 2005 (top), and spatial distribution of Black Rockfish landings in the Chignik management area, 2005 (bottom). \* indicates confidential catch.



**Figure 4.30 (Historical Figure 7.17).**—Monthly distribution of Black Rockfish landings in the South Alaska Peninsula management area, 2005 (top), and spatial distribution of Black Rockfish landings in the South Alaska Peninsula management area, 2005 (bottom). \* indicates confidential catch.



**Figure 4.31 (Historical Figure 7.18).**—Monthly distribution of rockfish landings in the Bering Sea/Aleutian Islands management area, 2005 (top), and spatial distribution of rockfish landings in the Bering Sea/Aleutian Islands management area, 2005 (bottom). \* indicates confidential catch.

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## **APPENDIX**

**Appendix A**–Common acronyms used.

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BSAI	Bering Sea/Aleutian Islands
CI	Cook Inlet
CGOA	Central Gulf of Alaska
GHL	Guideline Harvest Level
GHR	Guideline Harvest Range
GOA	Gulf of Alaska
mt	metric tons
nm	nautical miles
NMFS	National Marine Fisheries Service
PWS	Prince William Sound
SSL	Steller sea lion
TAC	Total Allowable Catch
WGOA	Western Gulf of Alaska

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