doi:10.7289/V5CJ8BTZ

Biological Assessment of the Effects of the Federal Fisheries, State Parallel Groundfish Fisheries and Pacific Halibut Fisheries on the Southwest Alaska Distinct Population Segment of the Northern Sea Otter and Its Designated Critical Habitat

June 2013

Prepared by
NMFS Alaska Region
Sustainable Fisheries Division
Juneau, Alaska

This Page Intentionally Blank

https://doi.org/10.7289/V5CJ8BTZ

Contents

List of Figures

List of Tables

Cover photo from http://alaska.fws.gov/fisheries/mmm/seaotters/otters.htm

Acronyms and Abbreviations Used

AAC	Alaska Administrative Code
ABC	acceptable biological catch
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
APDES	Alaska Pollutant Discharge Elimination System
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CAS	Alaska Region Catch Accounting System
CDQ	Western Alaska Community Development Quota
Council	North Pacific Fishery Management Council
ESA	Endangered Species Act
EEZ	Exclusive Economic Zone
FMP	fishery management plan
FR	*Federal Register*
GHL	Guideline Harvest Level
GOA	Gulf of Alaska
IFQ	Individual Fishing Quota
IPCC	International Panel on Climate Change
IPHC	International Pacific Halibut Commission
MSA	Magnuson-Stevens Fishery Conservation and Management Act
mt	metric tons
NMFS	National Marine Fisheries Service
nm	nautical miles
NPFMC	North Pacific Fishery Management Council
PCEs	Primary Constituent Elements
POP	Platform of Opportunity
RPA	Reasonable and Prudent Alternative
SAFE	Stock Assessment and Fishery Evaluation
State	State of Alaska
SWDPS	Southwest Distinct Population Segment
TAC	total allowable catch
QS	quota share
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOE-CIA	Vessel Monitoring System-Observer Enabled Catch-in-Areas

Executive Summary

Under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) listed the southwest Alaska distinct population segment (SWDPS) of the northern sea otter as threatened in 2005. In 2006, National Marine Fisheries Service (NMFS) and the USFWS consulted on the effects of the groundfish, crab, and scallop fisheries on the SWDPS of the northern sea otter. The consultation concluded with a determination that the fisheries were not likely to adversely affect the SWDPS. In 2009, the USFWS designated critical habitat of the SWDPS of the northern sea otter, and consequently, NMFS is requesting reinitiating consultation under section 7 of the ESA. The fisheries analyzed are:

- Alaska groundfish fisheries as authorized by the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area, the Fishery Management Plan for Groundfish of the Gulf of Alaska, and the State of Alaska parallel groundfish fisheries in State of Alaska waters
- Alaska king and Tanner crab fisheries as authorized by the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs
- Alaska salmon fisheries as authorized by the Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska
- Alaska scallop fisheries as authorized by the Fishery Management Plan for the Scallop Fishery off Alaska

In addition, this consultation pertains to the effect on SWDPS of northern sea otters and their critical habitat from Pacific halibut fisheries in U.S. Convention waters off Alaska within International Pacific Halibut Commission regulatory areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.

In this analysis, the potential direct and indirect impacts of federal fisheries and fisheries managed by the State of Alaska with federal coordination or oversight are evaluated in the context of the SWDPS of the northern sea otter and its designated critical habitat. The best available commercial information is used to describe the potential impacts of the fisheries on sea otters and on their designated critical habitat. Cumulative effects of non-federal actions also are examined.

Effects of the fisheries on sea otters and their critical habitat can be either direct or indirect effects. Direct effects include the incidental take of sea otters in fishing gear and the disturbance of sea otters by fishing vessels. The potential for incidental takes of SWDPS of northern sea otters in the fisheries analyzed in this biological assessment is discountable. Potential indirect effect on the SWDPS of northern sea otters or on their critical habitat is due to impacts on prey resources. Prey species are varied and include urchins, crabs, and bivalves, which may be directly or indirectly harvested in one or more target fisheries. Primary Constituent Elements (PCEs) for critical habitat include food, water, air, light, minerals, or other nutritional or physiological requirements (73 FR 76457, December 16, 2008). Fishery indirect effects on prey would be primarily from the direct or incidental harvest of these species or effects on the habitat that support these prey resources.

Fishery catch data within critical habitat, with particular attention to incidental catch of potential sea otter prey and fishery activities that may impact habitat supporting prey, are provided. This information is used to determine the potential impact of the fisheries on prey resources of the SWDPS of the northern sea otter and the potential impacts of the fisheries on the PCEs provided by designated critical habitat. The impacts of the fisheries are so small as to not have a measureable effect on the SWDPS of the northern sea otter, their prey, or designated critical habitat. The effects are therefore insignificant.

Conclusion:

Based on this analysis, the Alaska federally managed fisheries authorized by the fishery management plans and State of Alaska parallel groundfish fisheries and halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the SWDPS of the northern sea otter or its designated critical habitat.

SPECIES	LISTING STATUS	SWDPS IMPACTS DETERMINATION	CRITICAL HABITAT IMPACTS DETERMINATION
Southwest Alaska DPS Northern Sea Otter	Threatened	Not likely to adversely affect	Not likely to adversely affect

1.0 Introduction

The Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. § 1531 *et seq*.; ESA) provides the primary legal framework for the conservation and recovery of species in danger of or threatened with extinction. The purposes of the ESA include:

> "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] to provide a program for the conservation of such endangered species and threatened species ..." (16 U.S.C. § 1531(b)).

All federal actions that may affect listed species under the ESA, including management of the Alaska fisheries, must be reviewed under section 7(a)(2) of the ESA. In doing so, each federal agency must insure that its actions are not likely to jeopardize the existence of threatened or endangered species or destroy or adversely modify their designated critical habitat.

With the exception of the Pacific halibut fisheries, Alaska fisheries in federal waters are managed under fishery management plans (FMPs) authorized by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and adopted by the North Pacific Fishery Management Council (Council or NPFMC). The Council recommends the FMPs and amendments to these FMPs, the Secretary of Commerce approves, disapproves, or partially approves these recommendations, and NMFS implements the provisions of the FMPs by federal regulations at 50 CFR parts 679 and 680. All FMPs must comply with the MSA ten national standards as well as requirements of other applicable regulations and federal laws, including the ESA. The fisheries that may occur where sea otters are found are those in the Bering Sea and Aleutian Islands management area and in the Gulf of Alaska. The action analyzed in this biological assessment is the authorization of the following fisheries:

- Alaska groundfish fisheries as authorized by the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI Groundfish FMP), the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA Groundfish FMP), and the State of Alaska (State) parallel groundfish fisheries in State waters[1]
- Alaska king and Tanner crab fisheries as authorized by the Fishery Management Plan for Bering Sea/Aleutian Islands King and Tanner Crabs (BSAI Crab FMP)
- Alaska scallop fisheries as authorized by the Fishery Management Plan for the Scallop fishery off Alaska (Scallop FMP)
- Alaska salmon fisheries as authorized by the Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska (Salmon FMP)

The BSAI Crab FMP, Salmon FMP, and Scallop FMP delegate management to the State, with federal oversight. State management of these fisheries in federal waters must be consistent with the FMPs and MSA.

[1] The State parallel groundfish fisheries are managed by the State with the same species catch limits and time, area, and gear restrictions as applied to the federal fisheries. The most common targeted species under the State parallel fishery is Pacific cod with the incidental catch of other groundfish. State-only managed fisheries not subject to federal fisheries restrictions are addressed under *Sections 6.0 Environmental baseline* and *7.0 Cumulative effects.*

In addition, this consultation pertains to the effect on SWDPS of northern sea otters and their critical habitat from halibut fisheries in U.S. Convention waters off Alaska within International Pacific Halibut Commission (IPHC) regulatory areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.[2]

On August 9, 2005, the U.S. Fish and Wildlife Service (USFWS) listed the southwest Alaska distinct population segment (SWDPS) of the northern sea otter as threatened under the ESA. In 2006, NMFS engaged in informal consultation with the USFWS to evaluate the effects of the following Alaska fisheries on the SWDPS of the northern sea otter: federal groundfish fisheries in the Gulf of Alaska, Bering Sea, and Aleutian Islands; federal king and Tanner crab fisheries in the Bering Sea and Aleutian Islands; federal scallop fisheries; and the State parallel groundfish fisheries. This consultation was concluded in May 2006, with a determination that incidental take of the SWDPS of the northern sea otter was discountable, and that the fisheries were not likely to adversely affect the SWDPS of the northern sea otter.

This determination was based in large part on observations that the potential for overlap between these fisheries and SWDPS of the northern sea otter was extremely unlikely when considering the general location of sea otters and location of fisheries harvests. (Mecum 2006a, Mecum 2006b). As documented in the previous consultation in 2006, incidental mortality in commercial fisheries is infrequent, and there have been no new incidental take observations since the 2006 consultation.

In 2009, the USFWS designated critical habitat for the SWDPS of the northern sea otter (74 FR 51988, October 8, 2009). In response to this designation, NMFS is reinitiating consultation on the SWDPS of the northern sea otter and its designated critical habitat. This biological assessment includes the best available commercial data, including analysis techniques that were not available during the 2006 consultation on the Alaska fisheries effects on northern sea otters.

Table 1 provides the organization of this biological assessment and the contents of the sections of this document.

[2] The halibut resource and fisheries have been managed by the International Pacific Halibut Commission (IPHC) since 1923. The IPHC was established by a Convention between the United States and Canada, which has been revised several times to extend the Commission's authority and meet new conditions in the fisheries. "Convention waters" are defined as the waters off the west coasts of Canada and the United States, including the southern as well as the western coasts of Alaska, within the respective maritime areas in which either Party exercises exclusive fisheries jurisdiction. The Northern Pacific Halibut Act of 1982, 16 U.S.C. 773-773k, authorizes NMFS to implement regulations governing the halibut fisheries.

Table 1 Contents of biological assessment

1. Introduction	• General action description
2. Action area description	• FMP descriptions
3. Consultation status	• Critical habitat designation • Consultation on the FMPs
4. Description of species and critical habitat	• SWDPS of the northern sea otter and its critical habitat
5. Effect of federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries	• Analysis of impact on the sea otter and critical habitat from the FMPs
6. Environmental Baseline	• Past and present effects of activities in the action area
7. Cumulative Effects	• Potential impacts of future non-federal actions
8. Conclusions	• Determination of not likely to adversely affect or likely to adversely affect
9. Contributors and persons consulted	• Contributors and persons consulted for the biological assessment
10. References	• Listing of documents used to develop biological assessment
Appendix A	• Additional description of fisheries data methodology
Appendix B	• Maps of fisheries restrictions and sea otter sightings

2.0 Action area description

This biological assessment covers the fisheries authorized by the BSAI Groundfish FMP, GOA Groundfish FMP, BSAI Crab FMP, Scallop FMP and Salmon FMP.[3] These FMPs contain conservation and management measures necessary and appropriate to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of fisheries. The federal fisheries are managed in the waters of the exclusive economic zone (EEZ), which is 3 to 200 nautical miles (nm) off Alaska. State parallel groundfish fisheries are managed by the State of Alaska in the State waters adjacent to the EEZ from 0 to 3 nm. In addition, the biological assessment addresses potential adverse effects from halibut fisheries in U.S. Convention waters off Alaska within International Pacific Halibut Commission (IPHC) regulatory areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.

2.1 BSAI Groundfish FMP

The BSAI Groundfish FMP establishes the management provisions for groundfish fisheries of the BSAI. The FMP identifies the groundfish species, prohibited species incidentally caught in the federal groundfish fisheries, and ecosystem components. The BSAI is defined as the eastern Bering Sea and that

[3] The FMPs are located on the Council's website: http://www.alaskafisheries.noaa.gov/npfmc/.

portion of the North Pacific Ocean adjacent to the Aleutian Islands that is west of 170° W longitude, up to the United States-Russian Convention Line of 1867 (Figure 1). Fisheries managed under this FMP include: walleye pollock (Pollock), Pacific cod, sablefish, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, flathead sole, Alaska plaice, other flatfish, Pacific ocean perch, northern rockfish, shortraker rockfish, rougheye rockfish, other rockfish, Atka mackerel, squid, sharks, skates, sculpins, and octopus (Page 11 in NPFMC 2012a).

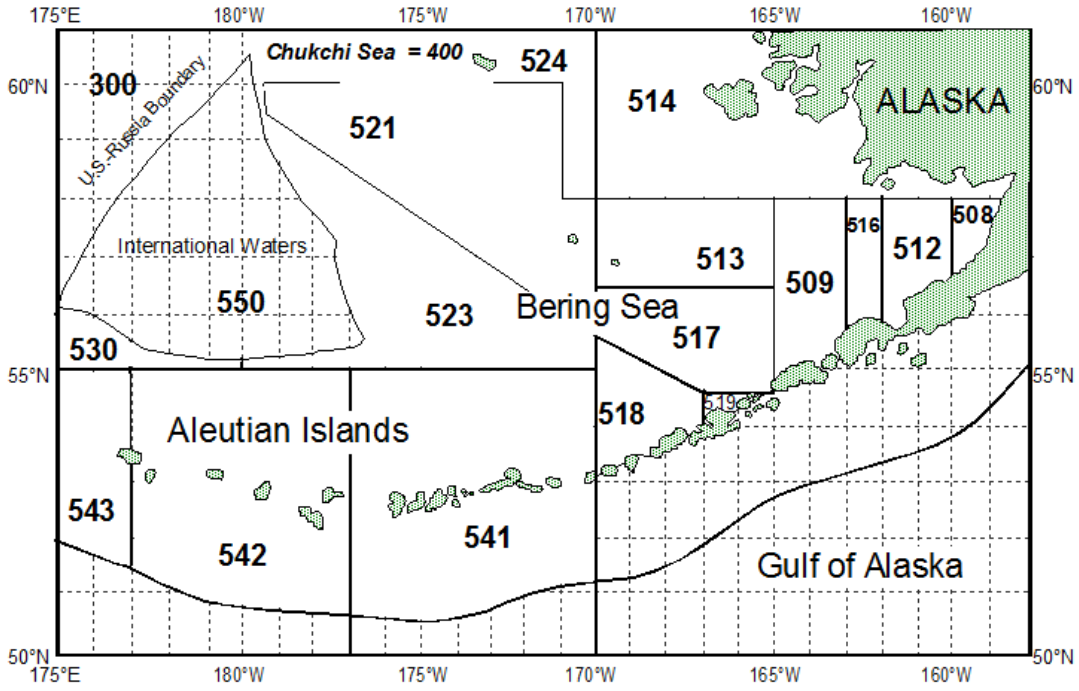


Figure 1 Bering Sea and Aleutian Islands statistical reporting areas

2.2 GOA Groundfish FMP

The GOA Groundfish FMP establishes the management provisions for groundfish fisheries of the GOA. The FMP identifies the groundfish species, prohibited species incidentally caught in the federal groundfish fisheries, and ecosystem components. The GOA is defined as the U.S. EEZ of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170° W longitude and Dixon Entrance at 132°40'W longitude (Figure 2). Fisheries managed under this FMP include: Pollock; Pacific cod; sablefish; shallow- and deep-water flatfish; rex sole; flathead sole; arrowtooth flounder; Pacific ocean perch; northern rockfish; shortraker and rougheye rockfish, other slope rockfish, pelagic shelf rockfish, demersal shelf rockfish[4], thornyhead rockfish, Atka mackerel, squid, sculpin, sharks, octopus, and skates (Page 11 in NPFMC 2012b).

[4] Management delegated to the State of Alaska.

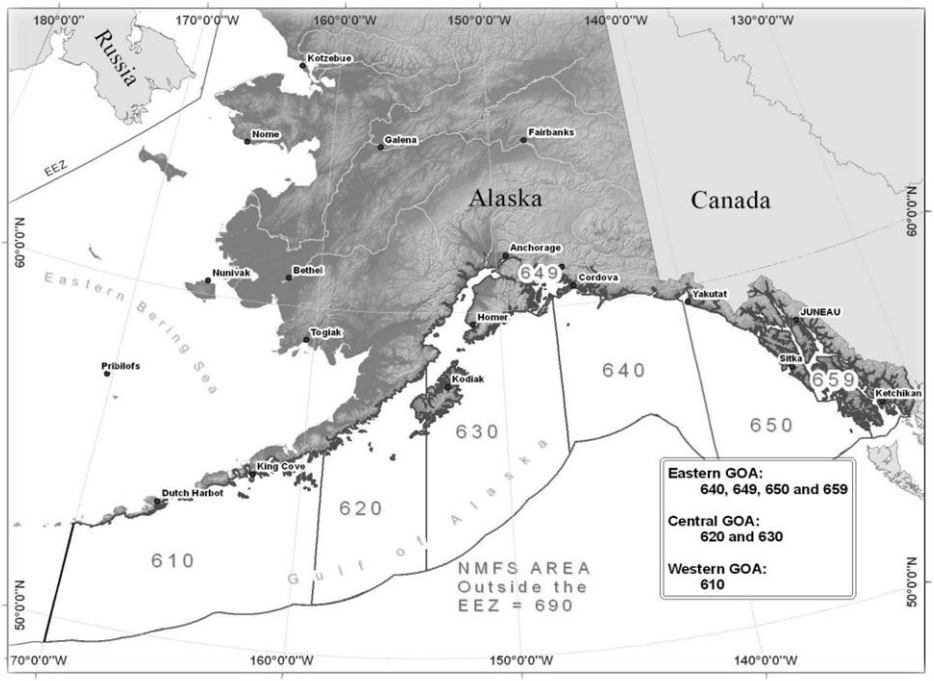


Figure 2 Gulf of Alaska statistical reporting areas

2.3 BSAI Crab FMP

The BSAI crab fisheries are managed under a State/federal cooperative management regime defined in the BSAI Crab FMP. The Bering Sea/Aleutian Islands crab management area is defined as those waters of the EEZ lying south of the Chukchi Sea statistical area (described in the coordinates to Figure 1 to 50 CFR part 679), east of the 1990 United States/Russian maritime boundary line, and extending south of the Aleutian Islands for 200 miles between the Convention line and Scotch Cap Light (164° 44'36"W longitude) (NPFMC 2011a) (Figure 3). BSAI crab fisheries are subject to joint federal and State management with certain elements of oversight deferred to the State, including inseason management, monitoring, and the placement of observers. These activities are managed, in part, through the BSAI Crab FMP and are consistent with the MSA and other applicable federal and State laws. Target crab species managed by the FMP are red king crab, blue king crab, golden (or brown) king crab, Tanner crab, and snow crab. The crab species defined in the BSAI Crab FMP that do not have an open fishery are considered prohibited species catch, and retention of those stocks is illegal.[5]

The State of Alaska manages crab stocks outside of the BSAI Crab FMP, including all GOA stocks (Woodby et al. 2005), Aleutian Islands Tanner crab, Dutch Harbor red king crab, St. Matthew golden king crab, and St. Lawrence blue king crab (NPFMC 2011a). Both FMP and non-FMP crab species, are generally taken using pot gear configured to meet State of Alaska regulations, which include specifications for construction and release mechanisms (5 AAC 34.050 and 5 ACC 35.050).

[5] Further, the GOA Groundfish FMP and the BSAI Groundfish FMP prohibit the retention of king crab and Tanner crab species caught in the groundfish fisheries.

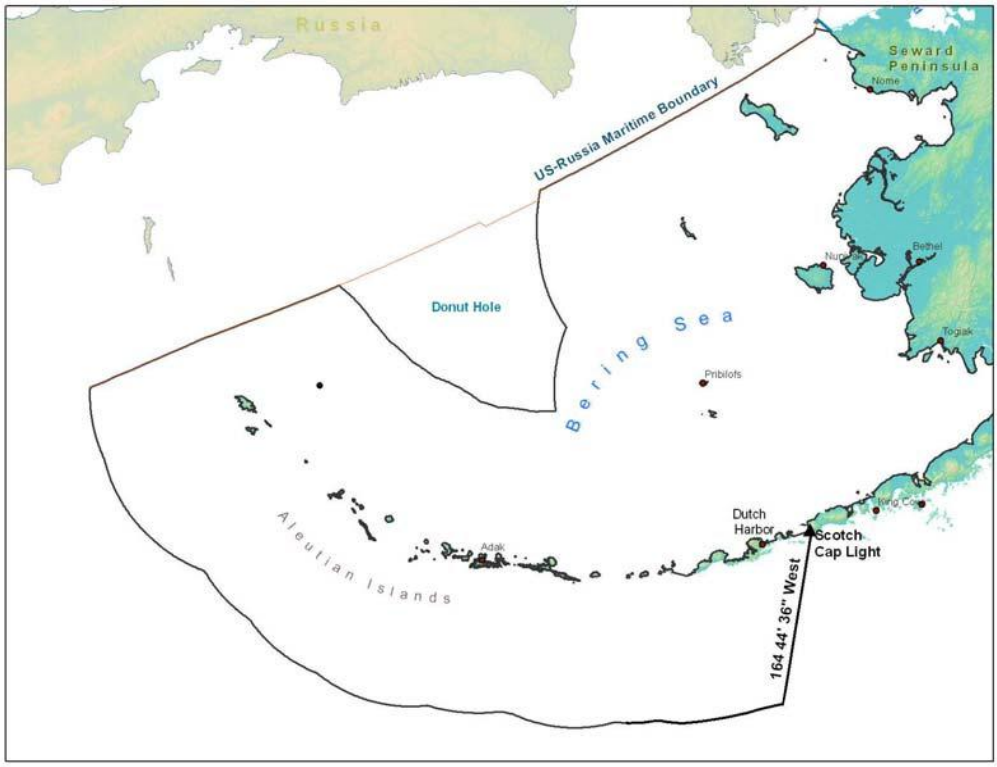


Figure 3 Bering Sea/Aleutian Islands crab management area

2.4 Scallop FMP

The Scallop FMP covers all scallop stocks off Alaska including weathervane scallops, pink or reddish scallops, spiny scallops, and rock scallops, although weathervane scallop is the only commercially exploited stock at this time. Commercial fishing for weathervane scallops pursuant to the Scallop FMP occurs in the GOA, Bering Sea, and Aleutian Islands and utilizes standard New Bedford style scallop dredges (NPFMC 2006b). Most aspects of scallop fishery management are delegated to the State, while limited access and other federal requirements are under jurisdiction of the federal government. The scallop fishery is managed jointly by NMFS and Alaska Department of Fish and Game (ADF&G) under the Scallop FMP. ADF&G management of the weathervane scallop fishery covers both State and federal waters off Alaska (Figure 4).

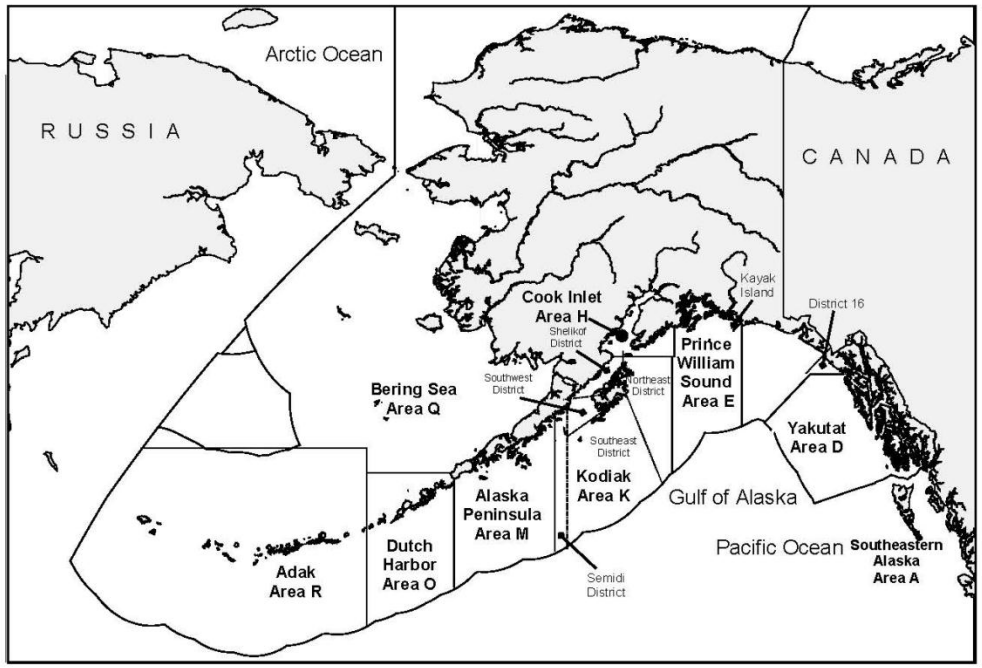


Figure 4 Alaska Weathervane Scallop Commercial Fishing Registration Area (NPFMC 2006b)

2.5 Salmon FMP

The Salmon FMP prohibits commercial salmon fishing in the salmon management area west of Cape Suckling (Figure 5). The salmon management area includes the EEZ off Alaska and the salmon fisheries that occur there, except for three areas excluded from the management area—Cook Inlet, Prince William Sound, and the Alaska Peninsula (Figure 6, Figure 7, and Figure 8)—that are managed by the State of Alaska (77 FR 19605, April 2, 2012).

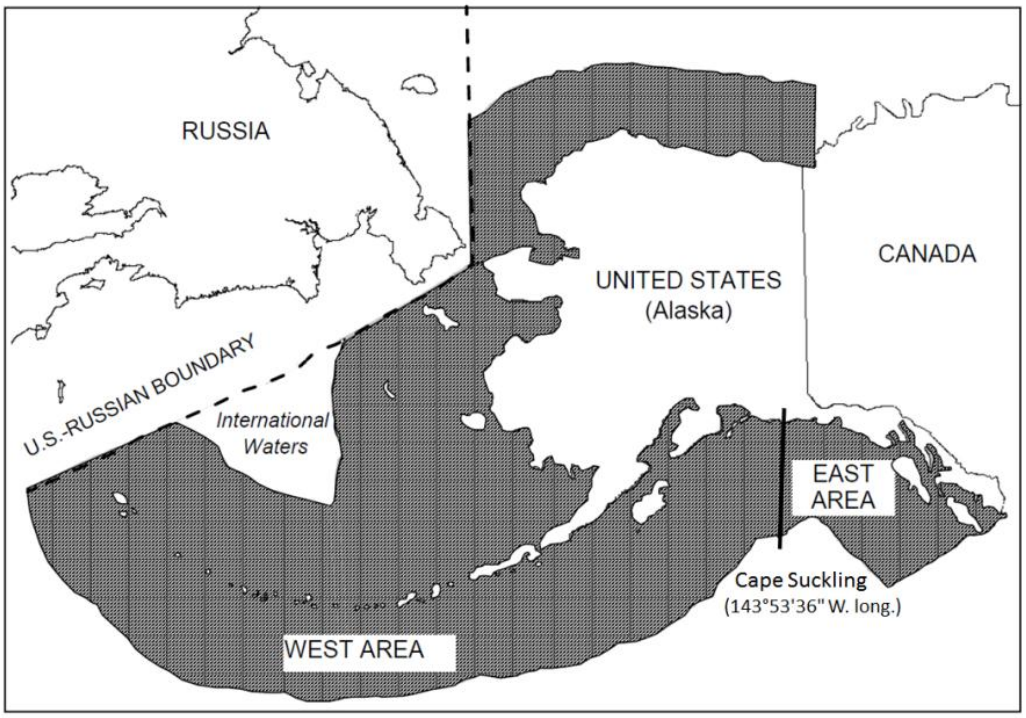


Figure 5 The Salmon FMP's management area, showing the East and West Areas

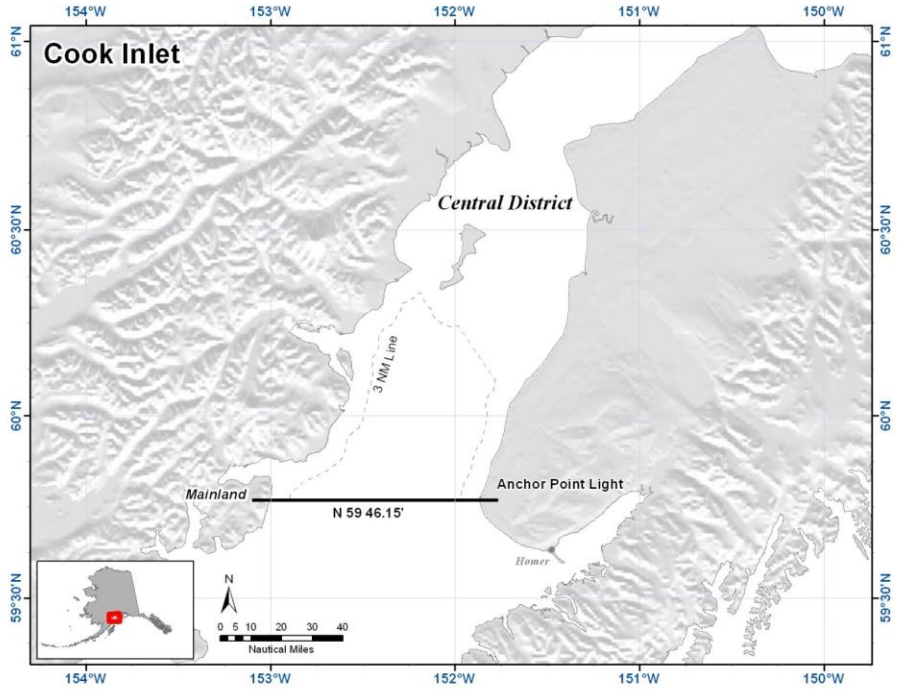


Figure 6 Cook Inlet Area — The EEZ waters that are excluded from the Salmon FMP management area are those waters north of the line from Anchor Point.

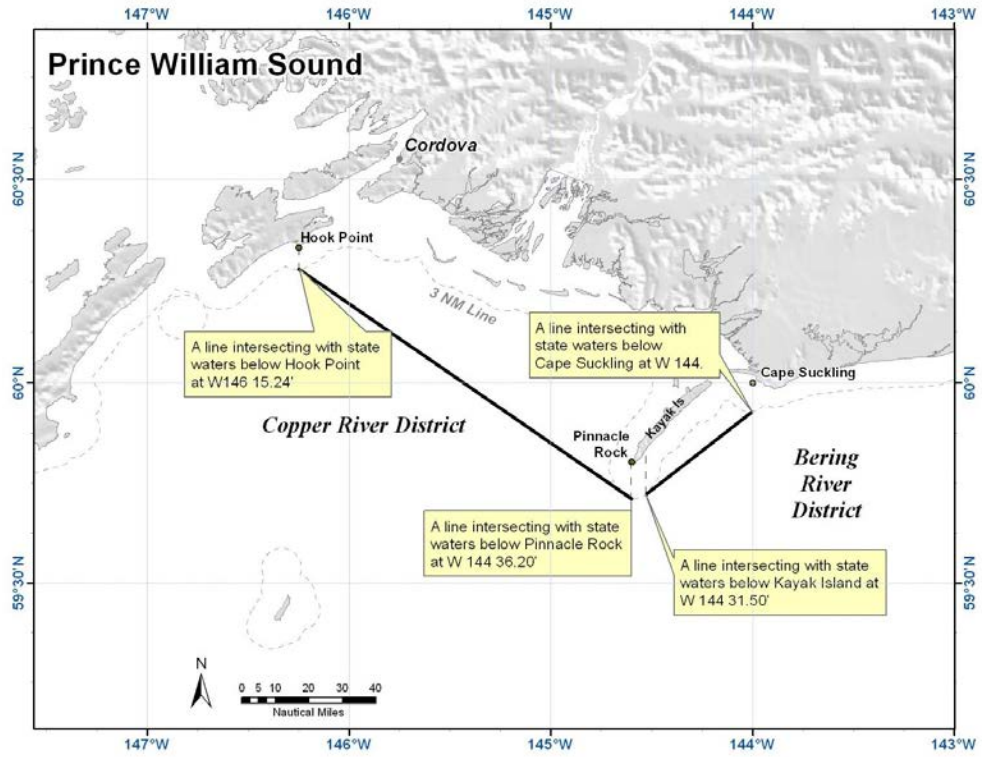


Figure 7 Prince William Sound Area — The EEZ waters that are excluded from the Salmon FMP management area are shoreward of the line from 3 nautical miles south of Hook Point to 3 nautical miles south of Pinnacle Rock and from a line at State waters at Pinnacle Rock to 3 nautical miles south of Cape Suckling.

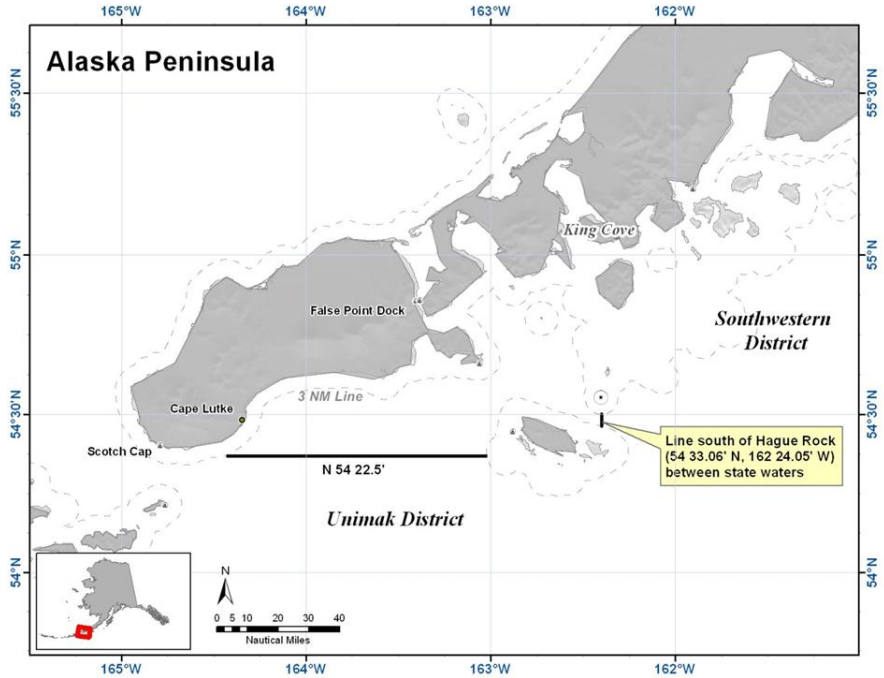


Figure 8 Alaska Peninsula Area — The EEZ waters that are excluded from the federal management area are shoreward starting from the line at 54°22.5' and a line south of Hague Rock that connects State waters.

2.6 Pacific halibut fisheries

The Pacific halibut fisheries are managed under IPHC regulations that are accepted by the U.S. Secretary of State and published by the National Oceanic and Atmospheric Administration, Assistant Administrator for Fisheries. The Convention between the United States and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea (Convention) provides the IPHC with the authority to develop regulations governing all fishing for halibut within Convention waters. The Northern Pacific Halibut Act of 1982 authorizes the Secretary of State, with the concurrence of the Secretary of Commerce, to accept or reject regulatory recommendations developed by the IPHC. The Council may develop and NMFS may implement additional regulations that do not conflict with accepted IPHC regulations. The Council has developed halibut management programs for the three fisheries that harvest halibut in Alaska: the subsistence, sport, and commercial.

The commercial halibut fishery includes the Individual Fishing Quota (IFQ) system and the Western Alaska Community Development Quota (CDQ) halibut program. IFQ permits authorize participation in commercial fixed-gear harvests of Pacific halibut and most sablefish fisheries[6] off Alaska. The permits are not vessel-specific and are distributed at no cost to holders of fishable Pacific halibut and sablefish quota share (QS) or to those who have received IFQ-only transfers from QS holders. The number of QS units held, the total number of QS units in the "pool" for a species and area, and the total amount of halibut or sablefish allocated for IFQ fisheries in a particular year determine authorized pounds for annual IFQ permits. IFQ permits are authorized at 50 CFR 679.4(d) (NMFS a).

NMFS initially issued QS to individuals who owned or leased vessels that made legal commercial fixed-gear landings of Pacific halibut or sablefish during 1988 to 1990 off Alaska. QS is transferable to other initial issuees or to those who have become eligible to receive transfers on NMFS' approval of an Application for Transfer Eligibility Certificate. Once issued to a person (at no charge), QS is held by that person until it is transferred, suspended, or revoked. QS permits are authorized at 50 CFR 679.4(d) (NMFS a). Under the CDQ program, NMFS annually withholds portions of the halibut catch limit from the IFQ allocation.

Subsistence[7] and sport halibut fisheries regulations are codified at 50 CFR part 300. The sport halibut fishery is regulated under guided (charter) and unguided fishing. Sport halibut regulations are determined annually by the Council and the IPHC, and published as part of the IPHC management measures each year. In 2003, a Guideline Harvest Level (GHL) program was implemented to manage the harvest by the sport guided (charter) fisheries in Areas 2C and 3A. The Council adopted a commercial-sport charter Catch Share Plan, which is expected to be implemented by the 2014 fishery, and will supersede the GHL program.

[6] The State-waters sablefish fishery is described under *Section 6.0 Environmental baseline*.

[7] Ceremonial and subsistence fishing for halibut in Subarea 2A–1 is permitted with hook-and-line gear from January 1 through December 31 (78 FR 16423, March 15, 2013).

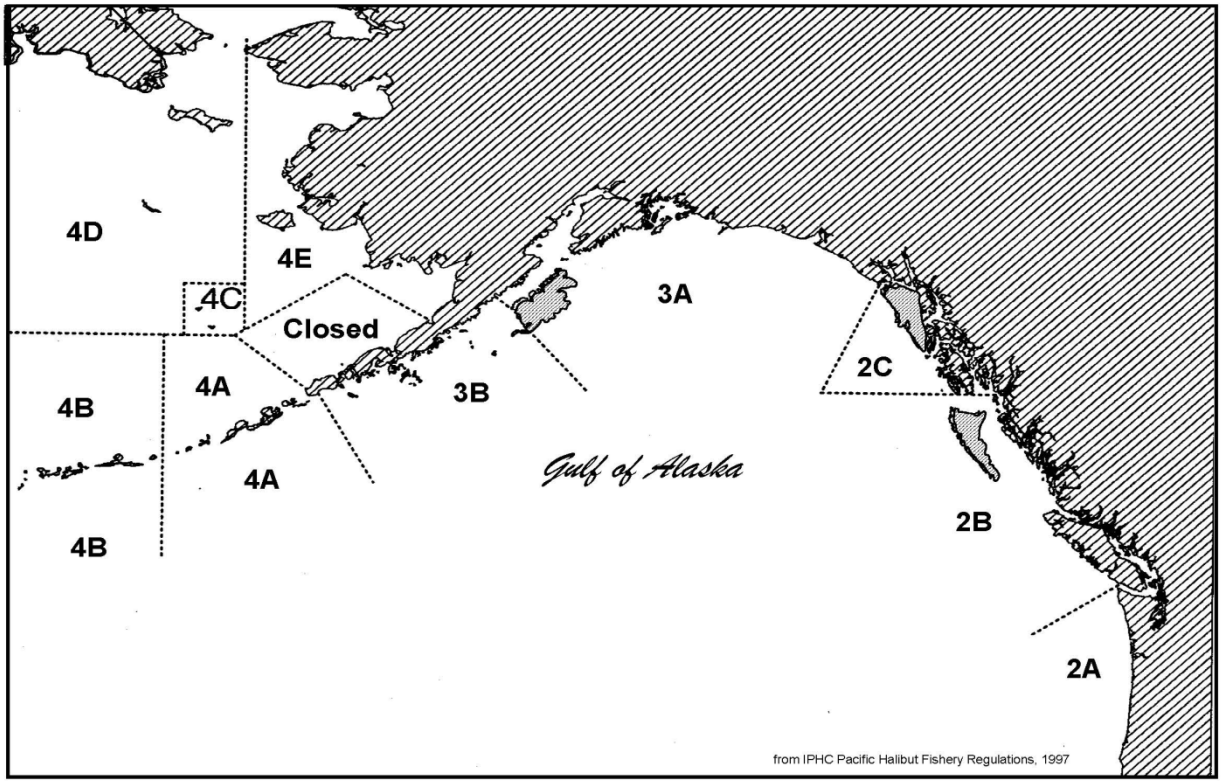


Figure 9 Regulatory areas for the Pacific halibut fisheries

Regulatory area boundaries for Pacific halibut fisheries (Figure 9) are as follows (IPHC 2013); critical habitat is within areas 3A, 3B, 4A, and 4B.

- Area 2A includes all waters off the states of California, Oregon, and Washington;
- Area 2B includes all waters off British Columbia;
- Area 2C includes all waters off Alaska that are east of a line running 340° true from Cape Spencer Light (58° 11'56" N latitude, 136° 38'26" W longitude) and south and east of a line running 205° true from Said Light;
- Area 3A includes all waters between Area 2C and a line extending from the most northerly point on Cape Aklek (57° 41'15" N latitude, 155° 35'00" W longitude) to Cape Ikolik (57°17'17" N latitude, 154° 47'18" W longitude), then along the Kodiak Island coastline to Cape Trinity (56° 44'50" N latitude, 154° 08'44" W longitude), then 140° true;
- Area 3B includes all waters between Area 3A and a line extending 150° true from Cape Lutke (54° 29'00" N latitude, 164° 20'00" W longitude) and south of 54° 49'00" N latitude in Isanotski Strait;
- Area 4A includes all waters in the Gulf of Alaska west of Area 3B and in the Bering Sea west of the closed area defined in section 10 of the Pacific Halibut Fishery Regulations that are east of 172° 00'00" W longitude and south of 56° 20'00" N latitude;
- Area 4B includes all waters in the Bering Sea and the Gulf of Alaska west of Area 4A and south of 56° 20'00" N latitude;

- Area 4C includes all waters in the Bering Sea north of Area 4A and north of the closed area defined in section 10 of the Pacific Halibut Fishery Regulations, which are east of 171° 00'00" W longitude, south of 58° 00'00" N latitude, and west of 168° 00'00" W longitude;
- Area 4D includes all waters in the Bering Sea north of Areas 4A and 4B, north and west of Area 4C, and west of 168° 00'00" W longitude; and
- Area 4E includes all waters in the Bering Sea north and east of the closed area defined in section 10 of the Pacific Halibut Fishery Regulations, east of 168° 00'00"W longitude, and south of 65° 34'00" N latitude.

3.0 Consultation status

Section 7(a)(2) of the ESA requires that each federal agency shall insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a federal agency may affect a protected species or its critical habitat, that agency (i.e., the "action" agency) is required to consult with either NMFS or the USFWS, depending upon the protected species or critical habitat that may be affected. Regulations at 50 CFR 402.16 describe a series of triggers, which when met, would require the federal agency to reinitiate consultation under section 7 of the ESA: (a) the amount or extent of taking specified in an incidental take statement is exceeded; (b) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in a biological opinion; or (d) a new species is listed or critical habitat designated that may be affected by the identified action. Section 7(b) of the ESA requires the USFWS and NMFS to summarize consultations in biological opinions that detail how actions may adversely affect threatened or endangered species and designated critical habitat.

On August 9, 2005, the USFWS listed the SWDPS of the northern sea otter as threatened under the ESA. NMFS initiated consultation on the SWDPS of the northern sea otter in February 2006, and based on this consultation, it was determined that the federal and State parallel groundfish as well as crab fisheries managed by the State of Alaska with federal oversight and the joint State/federally managed scallop fisheries were not likely to adversely affect the SWDPS of the northern sea otter by incidental take and disturbance (Mecum 2006b). The FMPs included the BSAI Groundfish, GOA Groundfish, BSAI Crab, and Scallop. The Salmon FMP was not included in that consultation.

USFWS designated critical habitat for the SWDPS of the northern sea otter on October 8, 2009 (74 FR 51988, October 8, 2009). In the proposed rule for critical habitat designation, the USFWS stated that with the exception of oil spills from shipwrecks, it does not believe that existing commercial fishing activities in southwest Alaska have the potential to harm the identified physical and biological features for the SWDPS of the northern sea otter (73 FR 76459, December 16, 2008). The USFWS also stated that besides the Dungeness crab and sea urchin fisheries in the Kodiak Island area (both are State fisheries and are discussed under *7.0 Cumulative effects*), current or foreseen commercial fishing practices do not target important sea otter prey and are not known to affect sea otter habitat in any obvious way (USFWS 2010).

The USFWS announced on April 26, 2013, that it is undertaking a 5-year review of the SWDPS of the northern sea otter and is requesting any information that has become available since the listing of the species (78 FR 24767).

To meet section 7(a)(2) requirements, NMFS requests ESA section 7 consultation on the effects of the federal and State parallel Alaska groundfish fisheries, joint State/federal managed fisheries, and State of Alaska fisheries implemented under federal oversight on the critical habitat of the SWDPS of the northern sea otter. In conjunction with this consultation, NMFS also requests reinitiation of consultation on the previously consulted FMPs: GOA Groundfish, BSAI Groundfish, BSAI Crab, and Scallop. This consultation includes program and project level consultations for the groundfish harvest specifications. NMFS also requests consultation on the Salmon FMP and on authorization of the halibut fisheries in IPHC regulatory areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.

The best scientific and commercial information regarding the SWDPS of the northern sea otter and its designated critical habitat and the effects of the fisheries is summarized below. The following discussion addresses information required for formal consultation requests, as described in 50 CFR 402.14(c) and section 4.2 of the ESA Section 7 Handbook (March 1998).

4.0 Description of species and critical habitat

4.1. SWDPS of the northern sea otter

The range of the SWDPS of the northern sea otter is from Attu Island at the western end of Near Islands in the Aleutians, east to Redoubt Point on the western side of lower Cook Inlet, and includes waters adjacent to the Aleutian Islands, the Alaska Peninsula, the Kodiak archipelago, and the Barren Islands. The SWDPS of the northern sea otter has declined from an estimated range of 94,050 to 128,650 sea otters in the mid-1970s to an estimated 53,674 sea otters, based on surveys conducted from 2000 to 2008 and adjusted for animals not detected during the surveys (USFWS 2010).

4.1.1. Potential causes of SWDPS northern sea otter decline

The potential causes of sea otter decline in the Aleutian Islands from the Southwest Alaska Distinct Population Segment of the Northern Sea Otter Draft Recovery Plan (USFWS 2010) are summarized below. Of the factors discussed in the Recovery Plan, predation by killer whales has been hypothesized to be the primary contributing factor to the recent decline of the SWDPS of the northern sea otter and may also impede timely recovery (USFWS 2010).

Predation
While not considered an important limiting factor in the past, predation is now thought to be a significant source of mortality contributing to population-level effects. Predators include bald eagles, white sharks, terrestrial predators, and killer whales. In the Aleutian Islands, sea otters are a small portion of bald eagle diet, and thus eagle predation is extremely unlikely to pose a serious threat to sea otter recovery. In Alaska, shark attacks are rare, but considered a potential source of mortality. Terrestrial predators may prey on sea otters where they haul out, although documented incidents are rare. Predation by killer whales has been hypothesized to be the primary contributor of the recent decline and may threaten timely recovery of sea otters.

Infectious disease
In Alaskan sea otters the most commonly diagnosed cause of death has been valvular endocarditis. The combination of valvular endocarditis, septicemia, and meningoencephalitis is referred to as Strep bovis

syndrome. After an Unusual Mortality Event investigation, it was determined that the Strep bovis syndrome represents a density-dependent disease and not a decline-causing process. However, the disease is still a concern since it has been detected in some SWDPS of the northern sea otter. In general, the decline of the stock without signs of a rebound and its broad geographic scope are not typical of a problem from disease alone. While not the primary factor, USFWS believes continued studies on disease are warranted.

Biotoxins and contaminants
Biotoxin compounds produced by dinoflagellates and diatoms increase under certain environmental conditions. USFWS is conducting studies on domoic acid, the cause of stranding and mortality in California sea otters, and Paralytic Shellfish Poisoning, present in the habitat of the SWDPS of the northern sea otter. Contaminants including persistent organic pollutants, perfluorinated compounds, and heavy metals may affect sea otters and their habitat, but are not considered a significant concern at this time.

Oil spills and oiling
Sea otters are at risk to oil contamination through contact with their fur and ingestion. Oil contamination can affect sea otters and recovery both immediately as well as in the long-term. Approximately 1,100 spills occurred in the range of the SWDPS of the northern sea otter since 1990, and USFWS stresses the importance of studying ship traffic patterns and existing regulations as well as designing contingency plans.

Food limitation
As an apex predator, there is the potential that sea otter population growth could be limited by prey abundance, and such food limitation events leading to increased mortality have been documented in the past. The recovery plan evaluated data concerning the role of food limitation in the decline of the SWDPS of the northern sea otter and determined the cause of the decline was unrelated to the abundance of prey resources as there was a consistent pattern of increased food availability during the decline. The potential impact of federally managed and State parallel groundfish fisheries on the prey availability of SWDPS of the northern sea otter is discussed under *Section 5.4.8 Incidental catch of potential sea otter prey in groundfish fisheries*.

Disturbance
Sea otters in areas of disturbance may travel away from the area, and this could cause those in raft formations to break up and not reform for hours. However, there is currently little boat traffic in most of southwest Alaska thus the impact of disturbance is likely very small in most areas. The potential for disturbance by federally managed and State parallel groundfish fisheries is discussed in *Section 5.4.7 Total groundfish in BSAI and GOA catch and effort within critical habitat*.

Bycatch and entanglement in debris
Sea otters may become entangled in the webbing of nets or trapped in fishing pots. Despite this potential, sea otters are rarely observed entangled or trapped by marine debris or fishing gear. The potential for interaction with federally managed and State parallel fisheries is discussed in *Section 5.0 Effects of federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries on the SWDPS* of the northern sea otter. The potential for interaction with State-managed fisheries is discussed under *Sections 6.0 Environmental baseline* and *7.0 Cumulative effects.*

Subsistence harvest
Section 101(b) of the Marine Mammal Protection Act authorizes harvest of marine mammals by Alaska Natives provided that the taking is for subsistence purposes or for the purpose of creating and selling authentic native articles of handicrafts and clothing, and is not wasteful. The ESA provides a similar

exemption under section 10(e). Since compared to the other sea otter stocks there are few Alaska Native villages within the range of the SWDPS, it is not surprising that the reported subsistence harvest from the SWDPS of the northern sea otter is the lowest of the three stocks of sea otters in Alaska (13 percent of the statewide total from 1989 to 2008). Of these, almost all of the otters taken were from the Kodiak archipelago (1,733 out of the total 1,775 harvested from 1989 to 2008). In the Kodiak archipelago, the harvest accounts for 0.67 percent of the regional population.

Habitat concerns
Currently the sea otter abundance within the range of the SWDPS is far below the capacity of the habitat and preferred prey is abundant. While there has been loss of kelp beds due to intensive urchin grazing, this has not apparently affected the sea otter population dynamics. Other than the commercial fisheries of the Dungeness crabs and sea urchins in the Kodiak area, current and future commercial fishing practices do not target important sea otter prey and are not known to affect sea otter habitat. The potential effects of federally managed and State parallel fisheries on habitat and potential prey are discussed in *Section 5.4.8 Incidental catch of potential sea otter prey in groundfish fisheries*. State-managed fisheries are discussed under *Sections 6.0 Environmental baseline* and *7.0 Cumulative effects*.

Illegal take
While there have been sea otter mortality events outside of the range of the SWDPS of the northern sea otter, the USFWS's Office of Law Enforcement has no records of unlawful harvest of sea otters within the range of the SWDPS of the northern sea otter. There is low density of human settlements in the range of the SWDPS of the northern sea otter and the area is remote, making enforcement difficult, thus the amount of illegal take is not conclusively known.

4.2 Critical habitat

When the USFWS listed the SWDPS of the northern sea otter as threatened in 2005, the USFWS considered critical habitat to be prudent, but not determinable, and did not designate critical habitat at the time of listing. A proposed rule to designate critical habitat for the SWDPS of the northern sea otter was published in the *Federal Register* on December 16, 2008 (73 FR 76454). Following a public comment period that was subsequently extended through July 9, 2009, the final rule was published in the *Federal Register* on October 8, 2009, and became effective on November 9, 2009 (74 FR 51988). The entire designated critical habitat, approximately 15,164 square kilometers, is located in Alaska (74 FR 51988, November 9, 2009).

In the process of defining critical habitat, the USFWS considered primary constituent elements (PCEs), which are the physical and biological features that are essential to conservation of the sea otter and may require special management considerations or protection. These PCEs are 1) space for individual and population growth and for normal behavior; 2) food, water, air, light, minerals, or other nutritional or physiological requirements; 3) cover or shelter; 4) sites for breeding, reproduction, or rearing (or development) of offspring; and 5) habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species (73 FR 76457, December 16, 2008).

The USFWS determined that the PCEs for the SWDPS of the northern sea otter are:

1) Shallow, rocky areas where marine predators are less likely to forage, which are waters less than 2 m in depth;
2) Nearshore waters that may provide protection or escape from marine predators, which are those within 100 m from the mean high tide line;

3) Kelp forests that provide protection from marine predators, which occur in waters less than 20 m in depth; and
4) Prey resources within the areas identified by PCEs 1 through 3 that are present in sufficient quantity and quality to support the energetic requirements of the species (73 FR 76458, December 16, 2008).

Of the PCEs determined for the SWDPS of the northern sea otter, federally authorized fishing operations have the potential to impact the fourth PCE: Prey resources within the areas identified by PCEs 1 through 3 that are present in sufficient quantity and quality to support the energetic requirements of the species.

Sea otters are considered opportunistic generalists who consume prey that they can capture (Funk 2003). Sea otter diet is documented by observing prey brought to the surface. Prey tends to be sessile or slow-moving benthic invertebrates such as mollusks, crustaceans, and echinoderms, including sea urchins. The type of prey and size depend on the location, time of year, duration at the location, and habitat type. While their environments are mostly characterized by rocky substrate, sea otters can also inhabit marine areas that have soft sediment substrates where clams are predominant prey (50 FR 46366, August 9, 2005). Where there are low densities of sea otters, sea urchins comprise a large portion of the diet while more fishes are eaten in areas of high population levels of sea otters (73 FR 76457, December 16, 2008). The top ten prey items observed during a study at Adak Island in the Aleutian Islands included: sea urchin, rock jingle, bivalve (unidentified), clam, sand lance, crab, annelid worm, echiurid worm, lump sucker, and sea cucumber (Funk 2003).

Sea otters dive to the seafloor to forage, and their diving ability to 100 m determines their seaward range (73 FR 76455, December 16, 2008). Research has indicated that 84 percent of foraging occurs in depths between 2 m and 30 m, and that 16 percent of all foraging was between 30 m and 100 m (73 FR 76455, December 16, 2008). Most of this foraging area, as well as the designated critical habitat, occurs within State waters (from mean high tide to 4.8 km [3 miles] offshore) (70 FR 46367, August 9, 2005); however, the designated critical habitat also includes federal waters (greater than 3 nm to 200 nm from shore). Critical habitat is located in federal reporting areas 610, 620, and 630 (Central and Western GOA); and 509, 512, 516, 518, 519, 541, 542, and 543 in the BSAI reporting areas. Critical habitat and sea otter sightings from the Platform of Opportunity database[8] are presented in Figure 10. The majority of sightings are in nearshore waters, which may indicate that sea otters occur primarily near shore, or the platforms of observation were located primarily nearshore, or both conditions.

[8] The Platform of Opportunity (POP) data set consists of marine mammal observations beginning as early as 1958 and recorded throughout the entire Pacific basin on NMFS-provided forms made from ships and other platforms collected outside the framework of a formal sampling design (Himes Boor and Small 2012). Each record in the POP data set documents one marine mammal sighting event, defined as the observation of one or more individuals of a single species during one observation event (Himes Boor and Small 2012). Sea otter sightings in this database fall under a generic sea otter identification and are not differentiated to the distinct population segment level. While sea otter sightings in the database go back to 1958, only data from the 1990s and 2000s are presented; the most recent sightings in the database are from 2007.

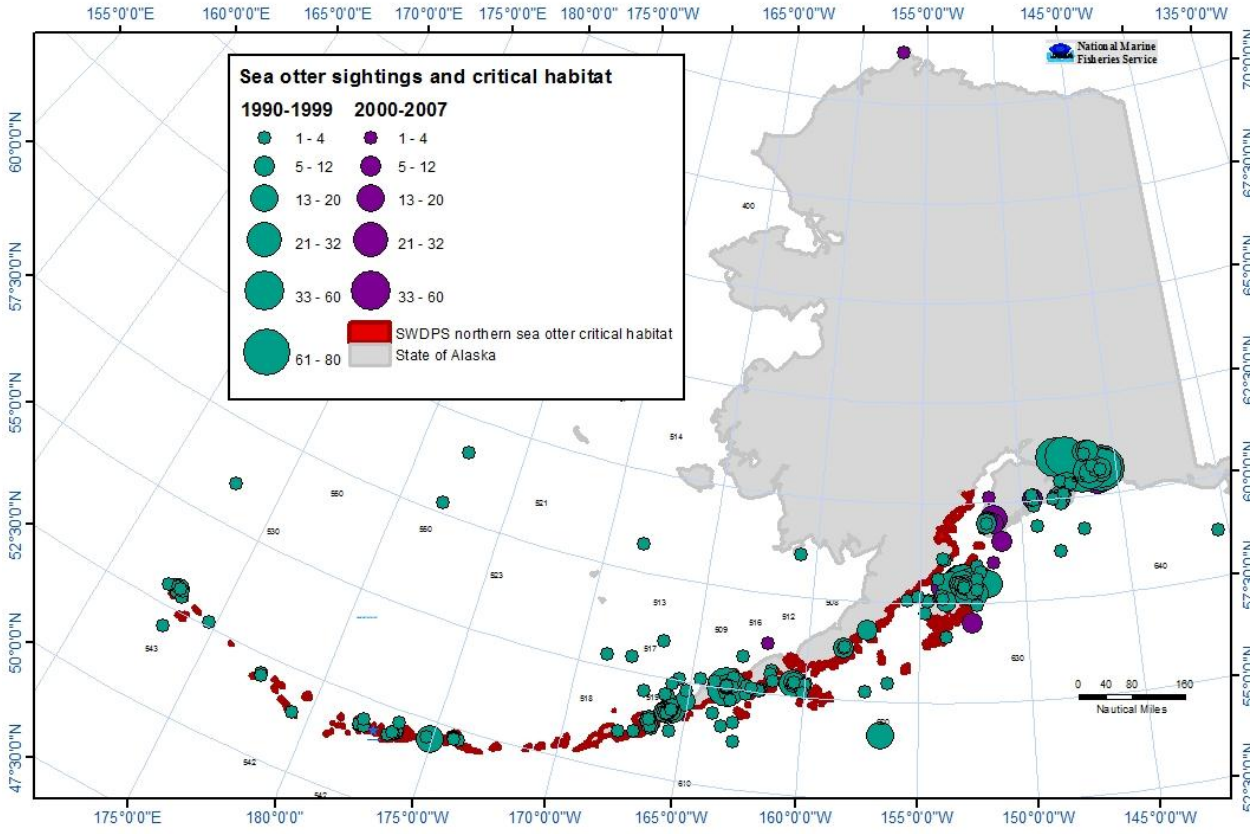


Figure 10 Platform of Opportunity sea otters sightings from 1990 to 2007 and critical habitat for the SWDPS of the northern sea otter[9]

5.0 Effects of federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries on the SWDPS of the northern sea otter

Fisheries may have direct or indirect effects on the SWDPS of the northern sea otter and its critical habitat. The draft recovery plan for the SWDPS of the northern sea otter states that with the exception of oil spills from shipwrecks, existing commercial fishing activities in southwest Alaska do not have the potential to harm the identified physical and biological features for the SWDPS of the northern sea otter.[10]

[9] Each circle represents one sighting; the size of the circle corresponds to the number of otters observed.

[10] In the previous 2006 consultation, it was determined that NMFS does not have the authority to regulate the release of oil from fishing vessels and that the U.S. Coast Guard would be the appropriate agency to address the potential effects on ESA-listed species of chronic oiling from all marine vessels (Mecum 2006b).

Potential direct effects include the incidental take of sea otters in fishing gear and the disturbance of sea otters by fishing vessels. Since 2006, there have been no observed incidental takes of SWDPS sea otters in any of the previously consulted FMP fisheries, or fisheries in the Salmon FMP, which was not the subject of the previous consultation. Correspondence with the Alaska Fisheries Science Center revealed a take in 1989 by trawl gear in federal reporting area 512 (Ren Narita, Fisheries Research Biologist, Alaska Fisheries Science Center, personal communication, January 9, 2012). This take was not previously discussed in prior consultations. In 1992, observers documented the bycatch of eight sea otters in groundfish pots in federal reporting area 543 (Ren Narita, Fisheries Research Biologist, Alaska Fisheries Science Center, personal communication, January 9, 2012). Fishermen also reported to on-board NMFS observers that four additional sea otters were taken by the same vessels during the same time, in the same area, and with the same gear (Hatfield et al. 2011). These four takes were not previously discussed in prior consultations. Due to the location of these pots, they were most likely targeting Pacific cod. In 1997, a fisherman self-reported the retrieval of a dead otter in a Bering Sea/Aleutian Islands groundfish trawl; however, it was indeterminate if the sea otter was dead or alive when it was caught in the net. Funk (2003) also noted a take resulting in mortality in the Aleutian Islands king crab pot fishery in 1975 through a self-report.

Potential indirect effects on the SWDPS of the northern sea otter or on their critical habitat are due to impacts on prey resources. The species harvested under the authority of the BSAI groundfish FMP, GOA Groundfish FMP, Scallop FMP, Salmon FMP, and halibut fisheries regulations do not appear to be principal sea otter prey. Crab is a recognized sea otter prey and is harvested under the authority of the BSAI Crab FMP. The potential effects of the harvest of crab on the SWDPS of the northern sea otter are discussed in *Section 5.1 Analysis of impact from the FMP for Bering Sea/Aleutian Islands King and Tanner Crabs.*

Sea otter prey may be harvested as incidental catch during fishing operations, or harmed or killed by fishing gear or fishing operations. In addition, sea floor habitat may be negatively impacted by fishing operations and which may impact the availability of sea otter prey. Different fishery gear types have varying degrees of severity of impact on the bottom-dwelling organisms and the seafloor habitat. There are a number of variables that determine the effects on the habitat and the ability of the habitat to recover: 1) type of gear employed; 2) depth of penetration of the gear into the sediment; 3) water depth; 4) nature of the substrate (e.g., rocky, mud, sand, pebble); 5) kind of benthic fauna being impacted (epibenthic, infauna, emergent fauna); 6) frequency of the area being fished; 7) weight of the gear on the seabed; 8) towing speed; 9) strength of the tides and currents; and 10) time of year (DeAlterus, J. et. al 1990).

Habitat conditions and target stock locations also influence the type of fishing gear used and the target fisheries. The sea floor of the Aleutian Islands region is generally characterized by hard and rough substrates, and the GOA has a greater range of habitats including banks, gullies, and slope (Rose and Jorgensen 2005). Sponges are the most common living substrate in both the GOA (43 percent) and Aleutian Islands (67 percent) (Malecha et al. 2005). The rough substrate of the Aleutian Islands makes trawling difficult; and in the GOA, fishing intensity is highest in gullies with depths of 100 to 200 m and along the outer edge of the shelf (Rose and Jorgensen 2005). In general, bottom-contact gear fisheries predominately fish at water depths of 50 to 850 m (Heifetz et al. 2009). This depth range suggests that the majority of fishing would occur outside of the critical habitat area designation. However, some of the fisheries that extend into shallower water have the potential to overlap into critical habitat. These include, but are not limited to: hook-and-line Pacific cod fishing (75 to 200 m); groundfish bottom trawling (75 to 200 m); golden king crab pot fishing (150 to 600 m); and Pacific cod pot fishing (50 to 150 m) (Heifetz et al. 2009).

The indirect and direct effects of federal and State parallel fisheries on the SWDPS of the northern sea otter will be focused on those areas where the sea otter has been most recently observed[11] and on their designated critical habitat. The potential for direct or indirect impacts by fishing operations are discussed below with respect to the BSAI Crab FMP, the Scallop FMP, the Salmon FMP, the BSAI Groundfish FMP, the GOA Groundfish FMP, and the halibut fisheries.

5.1 Analysis of impact from the FMP for Bering Sea/Aleutian Islands King and Tanner Crabs

Of the stocks under the authority of the BSAI Crab FMP, the following occur in the general vicinity of sea otter critical habitat and where SWDPS of the northern sea otter have been most recently observed: Bristol Bay and Adak red king crab, Aleutian Islands golden king crab, Eastern Bering Sea Tanner crab, and Eastern Bering Sea snow crab. The Adak red king crab fishery has been closed since 2003, and thus is not having an impact on the sea otter, critical habitat, or prey availability. As mentioned under Section 5.0, there was a mortality in the Aleutian Islands king crab pot fishery in 1975 through a self-report according to Funk (2003); however, this incident is considered an anomaly as there are no recorded observations of sea otters taken in king crab pots either before or after this incident. There is no indication that any changes in sea otter distribution or fisheries management would result in incidental take or increased disturbance by fishing operations as managed under the BSAI Crab FMP.

5.1.1 Crab gear types and effect on prey and habitat

Crabs are a potential sea otter prey source. However, the crab stocks managed under the BSAI Crab FMP occur predominately in waters beyond designated critical habitat, and thus the occurrence of sea otters predation is likely rare. In addition, some crab fisheries are entirely closed due to low stock numbers while others have time or area closures.

According to State of Alaska fishing regulations, king crabs may only be taken with king crab pots and Tanner crabs may only be taken with Tanner crab pots and ring nets (State of Alaska, 5 Alaska Administrative Code 34.050 and 35.050). The lateral movement of pots as they move across the ocean floor is thought to be most similar to pelagic trawl with smaller contact diameter and more weight concentrated on the contact surface (NMFS 2005a). In a 2003 survey of 13 fishery management experts across a range of disciplines and organizations who evaluated the impact of ten classes of fishing gear used in U.S. commercial fisheries, pot gear was assessed to have a medium impact on physical structure, medium-low impact on seafloor organisms, and medium-high impact on shellfish and crabs (Morgan and Chuenpagdee 2003). There are no studies available on the effect of Alaska pots, which are larger than traditional crab pots, on habitat (NMFS 2005a).

5.1.2 Crab fisheries data methodology

For the applicable stocks below, catch within critical habitat is compared to overall harvest data for the years 2003/04 to 2010/11 as provided in the Stock Assessment and Fishery Evaluation (SAFE) Reports from the years 2006, 2007, 2008, and 2011 (NPFMC 2006a, NPFMC 2007, NPFMC 2008,

[11] Sea otters observed as per the Platform of Opportunity data set for the years 2000 to 2007 in the Aleutian Islands, Bering Sea, and Gulf of Alaska in the waters off of critical habitat.

NPFMC 2011b). (Note that fishery catch estimates for the crab stock assessments correspond to the crab fishery year that ends June 30.) These data reflect the most recent years available for analysis using the methods described in this Biological Assessment, and there are no changes in fisheries management that would cause impacts that would alter the analysis or conclusions presented here. Catch for the FMP-directed crab fisheries were obtained from State of Alaska fish ticket records that contain landings information. Vessels making crab landings are required to report the State of Alaska Statistical Area where the catch occurred; however, these areas do not perfectly correspond with critical habitat boundaries. Thus, a single statistical area overlaps both critical habitat and non-critical habitat with no corresponding subdivision of catch. The critical habitat estimate of catch was obtained by determining the proportion of the total statistical area that resides in critical habitat. For example, if the total crab catch for a State statistical area was 100 metric tons (mt) and 10 percent of the statistical area resided in critical habitat, then 10 mt of crab would have been estimated as caught in critical habitat. This calculation method assumes that crab fishing occurs homogenously throughout a statistical area, which is unlikely to occur given variability in bathymetry, habitat, or species composition. In particular, crab fisheries are known to occur in deep water, and thus, this method would overestimate catch in shallow areas, which are a characteristic of the critical habitat. Regardless, this estimation technique represents the best science available for estimating crab fishery catch within critical habitat and is conservative (i.e., is more likely to overestimate catch within critical habitat).

5.1.3 Bristol Bay red king crab

Red king crabs are caught at depths up to 200 m. While this depth range overlaps with critical area habitat, red king crabs are generally in the deeper waters outside of sea otter range, except during the late winter and spring when they move into shallow water to mate and molt (Funk 2003). Bristol Bay red king crab fishery is the only viable red king crab fishery in or near the critical habitat of the SWDPS of the northern sea otter, and quotas are set annually based on NMFS trawl surveys and NMFS and ADF&G stock assessment analyses (Funk 2003). The fishery is managed for a total allowable catch (TAC) combined with restrictions for size (greater or equal to 165.1 mm [6.5 in] carapace width, sex [male only]), and season (no fishing during mating/molting periods). The stock is not currently overfished or subject to overfishing (NPFMC 2011b). Catch data indicates very small amounts caught within critical habitat: 0.03 mt of an overall harvest of 62,060.51 mt of Bristol Bay red king crab between the years 2003/04 to 2010/11. This suggests that even though the Bristol Bay red king crabs may be located in critical habitat, the fishery activity is so minor that it is likely not having a measureable effect on the sea otter, critical habitat, or prey availability, and is therefore insignificant.

5.1.4 Golden crab

Golden king crabs primarily inhabit waters along continental slopes of the Aleutian Islands, Bering Sea, and Gulf of Alaska at depths greater than 180 m (Woodby et al. 2005). There are some very low levels catch reported in the State Statistical Areas in or near the critical habitat areas in the BSAI (approximately 169.90 mt between 2003/04 and 2010/11). This is a minor amount of the total harvest for the Aleutian Islands golden king crab between 2003/04 and 2010/11 (20,438.87 mt) (ADF&G website). Based on this, golden king crab fishing is likely not having a measureable effect on sea otters, critical habitat, or prey availability, and is therefore insignificant.

5.1.5 Snow crab

Snow crabs occur in the northern and central Bering Sea on the continental shelf with major concentrations restricted to less than 300 m. They are generally caught between 100 and 200 m (Woodby et al. 2005). There is only low potential for overlap of the snow crab fishery with sea otters, except perhaps for sea otters transplanted to the Pribilof Islands (Funk 2003). There was no recorded catch of snow crab in the State Statistical Areas that overlap with critical habitat between 2003/2004 and 2010/2011.

5.1.6 Tanner crab

Tanner crabs are distributed in the eastern Bering Sea, Aleutian Islands, and the Gulf of Alaska with major concentrations restricted to less than 300 m (Woodby et al. 2005). Tanner crabs are generally caught between 100 to 200 m and most of the fishing effort for Tanner crabs occurs further offshore than normal sea otter foraging range, with the possible exception of some areas on the east side of Kodiak, however this is a State of Alaska fishery and discussed under *Sections 6.0 Environmental baseline* and *7.0 Cumulative effects* (Funk 2003).[12] While there is a small amount of catch reported in the State Statistical Areas within critical habitat in the BSAI (approximately 35.96 mt over eight years between 2003 and 2010), this amount is very small compared to the overall harvest for the Eastern Aleutian and Bering Sea Tanner crab fisheries (7,450 mt over seven seasons between the 2003/04 season and the 2010/11 season) (ADF&G website). This very small amount of catch indicates that Tanner crab fishing is likely not having a measureable effect on sea otters, critical habitat, or prey availability, and is therefore insignificant.

5.1.7 Effect of crab fishing on the SWPDS of the northern sea otter and critical habitat

Direct effects: A small amount of catch in the crab fisheries within critical habitat suggests there is little interaction between the fisheries and sea otters and thus likely little disturbance. There are no recorded observations of incidental take of sea otters in king crab fishing pots beyond an isolated incident in 1975, which is considered an anomaly. The observed take does not preclude a determination that the likelihood of take is discountable going forward and that fishing for crabs stocks authorized by the BSAI Crab FMP is not likely to adversely affect the SWDPS of the northern sea otter.

Indirect effects: While pot gear may have some impact on seafloor structure and bottom-dwelling organisms, the very small amount of crab gear deployed and resulting low level of catch likely occurring within critical habitat suggest the crab fisheries under the BSAI Crab FMP do not have a measureable effect on the SWDPS of the northern sea otter, and is therefore insignificant.

5.2 Analysis of impact from the FMP for the Scallop Fishery off Alaska

Of the FMP-listed scallop stocks, weathervane scallop is the only commercially exploited stock at this time. Scallop data was generated in the same manner as the crab data; estimates of scallop catch in critical habitat were made by apportioning the catch based on the proportion of the State Statistical Area residing

[12] Discussed under *Section 6.0 Environmental baseline*.

in critical habitat. Dredges are used for harvesting scallops in Alaska and catch bottom-dwelling organisms and seafloor vegetation. Dredges were assessed to have a high impact on physical structure, seafloor organisms, shellfish, and crabs (Morgan and Chuenpagdee 2003). To date, there have been no recorded observations of incidental take of sea otters in the scallop fishery, and there is no indication that either changes in sea otter distribution or scallop fisheries management would increase the potential for incidental take.

5.2.1 Weathervane scallops

Weathervane scallops occur on the continental shelf at depths of 37 to 229 m (Woodby et al. 2005) with the greatest abundance at depths of 45 to 130 m (NPFMC 2006b). The highest densities in Alaska are found along the eastern GOA coast from Cape Spencer to Cape St. Elias, around Kodiak Island, and in the Bering Sea. The Scallop FMP authorizes the State of Alaska to set guideline harvest ranges under State regulations (NPFMC 2006b). Weathervane scallops have not been documented in the diet of sea otters. Existing State regulations close most areas that are also closed to bottom trawling to protect crab and other sensitive habitat (NPFMC 2006b), and most of the fishing would occur in deeper waters outside of critical habitat. There is some minor catch reported in the State Statistical Areas within critical habitat (approximately 52.86 mt from 2003 to 2010, all within federal reporting areas 518, 610, 620, and 630).[13] The quantity of scallops harvested in reporting area 518, 610, and 620 are confidential due to the small number of vessels. From 2003 to 2010, 49.85 mt were harvested in reporting area 630. This is very small, especially compared to the total harvest during this time period (1,460.17 mt) (NPFMC 2012c). These data reflect the most recent years available for analysis using the methods described in this Biological Assessment, and there are no changes in fisheries management that would cause impacts that would alter the analysis or conclusions presented here. Although the gear is not designed to capture scallops, weathervane scallops are caught in the crab and groundfish fisheries stock assessment trawl surveys and in the commercial groundfish trawl fisheries in locations closed to scallop fishing. Figure 11 shows the locations of scallop caught in these surveys as well as the areas of weathervane scallop fishing in the Lower Cook Inlet and Kodiak Island vicinity (portions of reporting areas 620 and 630) (NPFMC 2012c).

[13] Catch within critical habitat was estimated as described for crab in *Section 5.1.2 Crab fisheries data methodology*.

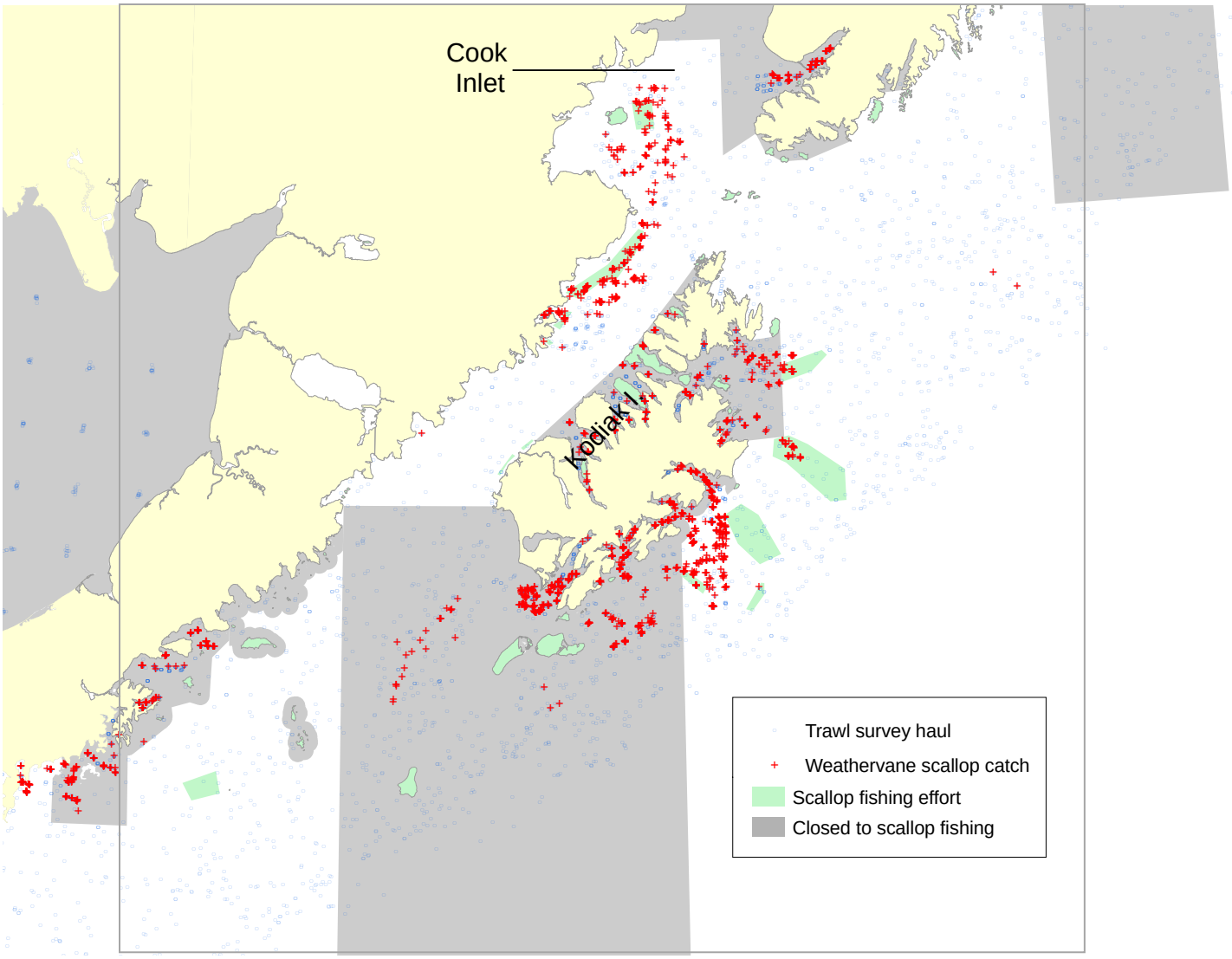


Figure 11 Trawl survey haul locations and locations with weathervane scallop catch in Lower Cook Inlet and the Kodiak Island vicinity, 2001 to 2010

5.2.2 Effect of scallop fishing on the SWDPS of the northern sea otter and critical habitat

Direct effects: A small amount of catch in the scallop fisheries within critical habitat suggests there is little interaction between the scallop fisheries and sea otters and thus likely little disturbance. There have been no recorded takes of sea otters in the scallop fisheries thus the likelihood of take is discountable and the scallop stocks under the Scallop FMP are not likely to adversely affect the SWDPS of the northern sea otter.

Indirect effects: While dredges were assessed to have a high impact on the seafloor and bottom-dwelling organisms, the very small amount of catch in the critical area and the lack of evidence for scallops being a sea otter prey indicate that the scallop fishery is likely not having a measureable effect on sea otters, critical habitat, or prey availability. Therefore, the effect of the scallop fisheries is insignificant.

5.3 Analysis of impact from the FMP for the Salmon Fisheries in the EEZ off Alaska

The Salmon FMP prohibits commercial fishing in the EEZ with the exception of a small area of the EEZ south of the Alaska Peninsula (see Figure 8). This area is not subject to federal management under the FMP. Therefore, the Salmon FMP will not result in actions that are likely to adversely affect sea otters, critical habitat, or prey availability. Potential effects on the SWDPS of the northern sea otter and its critical habitat are further discussed under *Sections 6.0 Environmental baseline* and *7.0 Cumulative effects*.

5.4 Analysis of impact from the groundfish FMPs (BSAI and GOA)

Groundfish fisheries have the potential to directly negatively impact the SWDPS of the northern sea otter through incidental take and disturbance by fishery operations. Interactions between fishery vessels and the SWDPS of the northern sea otter can be self-reported or recorded through the North Pacific Groundfish Observer Program. NMFS began placing observers on domestic vessels in 1986. The 1988 amendments to the Marine Mammal Protection Act required observers to be stationed aboard groundfish vessels to monitor marine mammal interactions. Since the 1990s, numbers of fisheries observers and vessels observed have ranged from approximately 300 to 400 (NMFS 2003).

While the groundfish target catch of the groundfish FMPs are not a major prey source for sea otters, groundfish fisheries have the potential to indirectly impact the SWDPS of the northern sea otter through the capture of potential sea otter prey as incidental bycatch in their fishing operations or the destruction of critical habitat through fishing practices. Observers collect groundfish and incidental bycatch data, which are used in the Catch Accounting System (CAS) described under *Section 5.4.3 Groundfish fisheries catch data methodology*.

Potential direct impacts to the SWDPS of the northern sea otter by incidental take or disturbance by fishery operations and indirect effects of fishing on critical habitat are discussed below. The indirect effect of sea otter prey caught as bycatch is discussed in *Section 5.4.8 Incidental catch of potential sea otter prey in groundfish fisheries*.

5.4.1 Incidental take

As discussed under Section 5.0, since the last consultation in 2006, there have been no observed incidental takes of SWDPS sea otters in any of the previously consulted FMP fisheries, or fisheries in the Salmon FMP, which was not the subject of the previous consultation. Pre-2006 documented takes are:

- In 1989 by trawl gear in federal reporting area 512. This take was not previously discussed in prior consultations.[14]
- In 1991, a trap lost in federal reporting area 543 and recovered in 1992 included a sea otter skull (Hatfield et al. 2011).
- In 1992, observers documented the bycatch of eight sea otters in groundfish pots in federal reporting area 543. Fishermen also reported to on-board NMFS observers that four sea otters were taken by the same vessels during the same time period, in the same area, with the same gear

[14] Ren Narita, Fisheries Research Biologist, Alaska Fisheries Science Center, personal communication, January 9, 2012.

and the same vessels (Hatfield et al. 2011). These four takes were not previously discussed in prior consultations. Due to the location of these pots, they were most likely targeting Pacific cod.[15]

- In 1997, a fisherman self-reported the retrieval of a dead otter in a Bering Sea/Aleutian Island groundfish trawl; however, it was indeterminate if the sea otter was dead or alive when it was caught in the net.

These takes were isolated incidents with the most recent occurring in 1997. The presence of observers on observed vessels in recent years suggests that if takes were to occur, they would likely be documented. The reduction in takes may be partially explained by changes in fisheries management, such as limited access programs, that have reduced the "race for fish" in certain fisheries, such as the Western Alaska CDQ Program and the Bering Sea and Aleutian Islands Pollock Cooperatives under the American Fisheries Act. In addition, the reduced number of sea otters in the Aleutian Islands further diminishes the possibility of takes in fishing gear.

5.4.2 Gear types and habitat impacts

Authorized gear types for groundfish in the BSAI and GOA are pelagic and non-pelagic trawls, hook-and-line, pot (described above under *Section 5.1.1 Crab gear types and effect on prey* and habitat), jig, and other gear as defined in regulations at 50 CFR 679.2 (NPFMC 2012a, NPFMC 2012b). The gear types that are likely used in or near critical habitat are discussed below.

Pelagic trawls are a cone or funnel-shaped net towed through the water by one or more vessels, and are used to mostly catch pelagic and bentho-pelagic school species, such as Pollock. Pelagic trawls utilize a large net mesh so that few if any benthic organisms that swim up into the net would be retained. Sessile organisms may be damaged by the pelagic trawl footropes, while more mobile organisms may cross over the footrope with less damage (NMFS 2005a). In a 2003 survey conducted of scientists and experts, pelagic gear was assessed to have a low impact on physical structure, seafloor organisms, shellfish, and crab (Morgan and Chuenpagdee 2003).

Longline is a stationary, buoyed, and anchored line with hooks attached, which targets a range of groundfish and pelagic species in Alaska. Longline includes hook-and-line, jig, troll, and handline. Hook-and-line is a stationary, buoyed, and anchored line with hooks attached. Jig gear is a single line, non-buoyed, non-anchored line with hooks attached. Handline is a hand-held line, with one or more hooks attached, that may be operated manually. Hand troll is one or more lines, with lures or hooks attached, drawn through the water behind a moving vessel. Bottom-dwelling organisms that provide structure may be hooked by contact with the line; however there is not any data to indicate the proportion of the organisms retained in relation to those on the seafloor (NMFS 2005a). Longline-type gear was assessed to have a low impact on physical structure, seafloor organisms, shellfish, and crab (Morgan and Chuenpagdee 2003).

Non-pelagic trawls, or bottom trawls, are a cone or funnel-shaped net towed through the water by one or more vessels, and target groundfish stocks. Depending on the target fishery, bottom trawl configurations vary. The bottom trawl net mesh gets smaller towards the intermediate and codend, with the codend typically having 5.5- to 8-inch stretched diamond mesh. Chafing gear, typically polyethylene fiber, is attached to the codend to protect it from abrasion from contact with the stern ramp and the seafloor.

[15] Ren Narita, Fisheries Research Biologist, Alaska Fisheries Science Center, personal communication, January 9, 2012.

Sweeps are made of wire or combination rope and may have bobbins to lift the sweep off the bottom.[16] Footropes are covered with rubber discs and bobbins to keep the front of the net off the bottom. This allows for herding fish into the net with minimum bottom contact, reducing gear damage and drag and maintaining fish quality by keeping sand out of the catch (NPFMC 2012d).

A variety of studies have been conducted on the effects of non-pelagic trawls on seafloor habitat. Freese et al. (1999) conducted a trawl study on a hard-bottom seafloor habitat east of Sitka that was a relatively pristine habitat using a trawl typical of the commercial rockfish fishery in the Aleutian Islands. Researchers found that after trawling, a number of boulders were displaced and epifauna were removed or damaged. Fifty-five percent of the sea whips and 67 percent of erect sponges were damaged. A year after the trawling, the sponges did not show signs of repair or regrowth (NPFMC 2000). Models indicate that for sponges, a mortality of 67 percent of the initial sponge biomass would result in recovery to 80 percent of the original biomass after about 20 years without further damage or removals. Corals would recover to 80 percent of the original biomass after about 34 years without further damage or removals (Rooper et al. 2011).

However, in the same study, while bottom trawling reduced the shelter value of the invertebrate community by eliminating the sponges and associated invertebrate taxa, Freese et al. (1999) determined that densities of motile invertebrate species did not differ significantly inside and outside the trawl paths. None of the five groups of motile invertebrates (asteroids and ophiuroids, holothurians, arthropods, molluscs, and echinoids) showed a significant reduction in density as a result of trawling. Although echinoid density appeared to be significantly greater in reference transects than in trawl transects, the difference was not significant after Bonferroni adjustments for experiment-wide comparisons. Of the echinoderms listed, only the brittlestar *Amphiophiura ponderosa* was susceptible to damage; in trawl transects, 23 percent of the individuals were crushed or had missing rays compared to 2 percent in the reference transects. Apparent damage to echinoids, holothurians (sea cucumbers), molluscs, and arthropods was less than 1 percent (Freese et al. 1999).

McConnaughy et al. (2000) compared the effects of macrofauna on bottom trawling in the eastern Bering Sea between heavily fished and non-fished areas using niche breadth, which reflects the distribution of a species among stations, and thus the diversity of habitats in which the species is found. Low values of niche breadth represent a patchy distribution and higher values a more consistent distribution. Taxa were assigned into three functional groups: motile, sedentary, and infaunal. Among sedentary (mostly sessile) organisms, niche breadth was never greater in the heavily fished areas. There was a more patchy distribution for the attached or non-motile members of the epibenthic community (e.g., sponges, anemones, soft corals, stalked tunicates) in the heavily fished areas. For the motile organisms (mostly crabs and sea stars), there was no apparent pattern in niche breadth. For the infaunal (bivalve) group, niche breadth was consistently greater in the heavily fished area for the four clam taxa, but the opposite was true for two of the three cockles, and not significant. These results suggest that sessile species, and especially those that are not passed over by the trawl, are most heavily impacted by trawling, while the motile ones that comprise most of sea otter prey, may be less impacted. Survey results from Morgan and Chuenpagdee (2003) suggest that bottom trawling has a high impact on physical structure, seafloor organisms, and a medium impact on shellfish and crabs.

[16] Elevating devices on non-pelagic trawl sweeps are required in the Bering Sea flatfish fishery and were recommended by the North Pacific Fishery Management Council for the Central GOA flatfish fishery in April 2012. The rulemaking for this action is under development.

5.4.3 Groundfish fisheries catch data methodology

Catch from the groundfish fishery is maintained in an electronic database called the Alaska Region Catch Accounting System (CAS), which is the official database of record for Alaska Region catch. This system contains estimates for retained and discarded groundfish, prohibited species, and non-groundfish species starting in 2003. For the time period 2003 to 2010, available catch data for each of the target fisheries under these FMPs is provided within critical habitat. These data reflect the most recent years available for analysis using the methods described here. A review of preliminary data from the 2011 and 2012 fisheries indicate that some areas of critical habitat that were previously opened to fishing for specific groundfish species have since been closed. These closures would result in less catch coming from critical habitat and are noted in the following sections. However, the spatial resolution of data stored in CAS is at the State Statistical Area and is a much larger resolution than the critical habitat area. Estimates of catch by the groundfish fisheries in the critical habitat area were based on CAS estimates that were modified in the Vessel Monitoring System-Observer Enabled Catch-in-Areas (VOE-CIA) database.

The VOE-CIA modified CAS estimates by using a spatial algorithm that apportions catch from the larger State statistical units available in CAS to smaller units that are approximately 7 km^2. In other words, catch estimates are simply apportioned to smaller units based on the amount of time a vessel spent during a trip across a grid divided into 7 km^2 units using vessel monitoring system information or, if available, observer information that contains geographic coordinates. While the CAS and VOE-CIA represent the best available science for catch and effort, there are several important assumptions regarding the interpretation of catch estimates:

- The sinuous boundary of the critical habitat area does not correspond to the exact boundaries of the VOE-CIA estimates. The VOE-CIA estimates catch and effort for each 7 km^2 unit that may overlap non-critical habitat areas, resulting in an overestimate of catch and effort in critical habitat.
- The apportioning algorithm in the VOE-CIE assumes catch is perfectly linear with VMS effort.
- Catch is assumed to be homogenous within a 7 km^2 unit, which is not likely the situation in nearshore areas with variability in bathymetry, habitat, or species composition.

Specifically, this may result in an overestimate of catch and effort in critical habitat due to groundfish fisheries occurring in deeper waters. See *Appendix A* for a more detailed description of the VOE-CIA.

Groundfish catch within the BSAI and GOA are provided below. Catch amounts represent only the federal or State parallel portion of total catch. Catch does not include that portion of the ABC that was designated as State guideline harvest level (GHL) allocations.

5.4.4 Groundfish fisheries catch effort in SWDPS northern sea otter critical habitat

While depth and other regulatory restrictions limit groundfish fishing within critical habitat, some federal fishing does occur. However, these restrictions suggest that fishing is not equally prevalent throughout critical habitat as some gear types may be prohibited in certain regions. For example, in 2011, additional restrictions under the Steller sea lion protection measures were implemented in the Aleutian Islands and have resulted in additional fishery restrictions and reduced target species and incidental catch.[17] *Appendix B* provides maps of fishery restrictions in relation to critical habitat and documented sea otter sightings

[17] These measures are discussed further under *Section 5.4.5 BSAI Groundfish FMP*.

from 1990 to 2007. Groundfish fisheries catch effort in critical habitat is used as a proxy for the potential degree of disturbance to sea otters and the potential impact to prey habitat. Groundfish fisheries catch effort in critical habitat is presented as the amount of catch within critical habitat and the number of federally permitted fishing vessels by reporting area.

5.4.5 BSAI Groundfish FMP

Within critical habitat in the BSAI, target species are Atka mackerel, Pollock, Pacific cod, other flatfish, shallow-water flatfish, rockfish, flathead sole, other species, rock sole, sablefish, Greenland turbot, arrowtooth flounder, and yellowfin sole. Table 2 shows these fisheries by gear type. Halibut is managed by the International Pacific Halibut Commission and not included under this FMP. This analysis focuses on those fisheries that have more than 100 mt of catch from 2003 to 2010 as any amounts less than 100 mt are not likely to result in any measureable effects on the SWDPS of northern sea otters and this amount allows for focusing the analysis on fisheries that may have an impact. NMFS chose the 100 mt threshold based on a review of available catch data and determined that catch less than 100 mt over the eight year period examined is indicative of very infrequent activity within critical habitat and the available data do not indicate any trend of persistent fishing within critical habitat by groundfish fisheries with less than 100 mt of catch over the 2003 through 2010 time period.

Table 2 Target fisheries by gear type[18] that occur within critical habitat in the BSAI

	Non-pelagic trawl	Pelagic trawl	Pot	Hook-and-line	Jig
Atka mackerel	X				
Pollock	X	X			
Pacific cod	X		X	X	X
Other flatfish	X				
Shallow-water flatfish	X				
Rockfish	X			X	
Flathead sole	X				
Other species			X	X	
Rock sole	X				
Sablefish			X	X	
Greenland turbot	X			X	
Arrowtooth flounder	X		X	X	
Yellowfin sole	X				

The total amount of groundfish caught in the BSAI SWDPS northern sea otter critical habitat area was 5,439.28 mt for the time period 2003 to 2010.[19] Only a small proportion of the total groundfish harvests occur within critical habitat (see Table 7 for more detail). The following target fisheries had catches greater than 100 mt for 2003 to 2010 in the BSAI critical habitat area:

[18] Gear types with recorded catch greater than 100 mt from 2003 to 2010 within critical habitat.

[19] The VOE-CIA database has estimates starting in 2003 for retained and discarded groundfish, prohibited species, and non-groundfish species.

- Pollock, pelagic trawl (2,866.50)
- Pacific cod, non-pelagic trawl (1,166.19)
- Pacific cod, pot (516.32)
- Pacific cod, hook-and-line (322.17)
- Rockfish (Pacific ocean perch fishery), non-pelagic trawl (160.00)
- Atka mackerel, non-pelagic trawl (135.16)

5.4.6 GOA groundfish fisheries within critical habitat

Within critical habitat in the GOA, target species are Pollock, Pacific cod,[20] deep-water flatfish, other flatfish, shallow-water flatfish, rockfish, flathead sole, other species, rock sole, sablefish, Greenland turbot, and arrowtooth flounder. Table 3 shows these fisheries by gear type. While these are the target stocks, other groundfish are also caught and retained. Halibut is managed by the International Pacific Halibut Commission and not included under the GOA Groundfish FMP.

Table 3 Target fisheries by gear type[21] that occur within critical habitat in the GOA

	Non-pelagic trawl	Pelagic trawl	Pot	Hook-and-line	Jig
Pollock	X	X	X	X	X
Pacific cod	X	X	X	X	X
Deep-water flatfish	X				
Other flatfish	X				
Shallow-water flatfish	X				
Rockfish	X	X		X	X
Flathead sole	X				
Other species	X		X	X	
Rock sole	X				
Sablefish				X	
Greenland turbot				X	
Arrowtooth flounder	X	X		X	

The total amount of groundfish caught in the GOA critical habitat area is 38,035.66 mt for the time period 2003 to 2010.[22] The following target fisheries were above 100 mt from 2003 to 2010:

- Pollock, pelagic trawl (22,914.66)
- Pacific cod, pot (9,494.75)
- Pacific cod, hook-and-line (2,037.89)

[20] Starting in 2012, Amendment 83 to the GOA Groundfish FMP allocates Western and Central GOA Pacific cod TAC limits among various gear and operational sectors (76 FR 74670, December 1, 2011).

[21] Gear types with recorded catch greater than 100 mt from 2003 to 2010 within critical habitat.

[22] The VOE-CIA database has estimates starting in 2003 for retained and discarded groundfish, prohibited species, and non-groundfish species.

- Pacific cod, non-pelagic trawl (1,503.92)
- Shallow-water flatfish, non-pelagic (432.38)
- Arrowtooth, non-pelagic trawl (352.13)
- Pollock, non-pelagic trawl (321.10)
- Sablefish, hook-and-line (226.11)
- Pacific cod, jig (171.18)

5.4.7 Total groundfish in BSAI and GOA catch and effort within critical habitat

Target fisheries that had greater than 100 mt of total groundfish within the GOA or BSAI areas of critical habitat are presented in Table 4. Total groundfish caught in the BSAI and GOA represents a cumulative impact of groundfish fishing in the combined BSAI and GOA critical habitat.

Table 4 Catch (mt) in critical habitat of target fisheries (greater than 100 mt in the critical habitat) by GOA and BSAI Groundfish FMP management areas from 2003 to 2010

Target fishery	GOA area of critical habitat (2003–2010) (mt)	BSAI area of critical habitat (2003–2010) (mt)	Total catch in critical habitat (2003–2010) (mt)
Non-pelagic			
Pacific cod	1,503.92	1,166.19	2,670.11
Shallow-water flatfish	432.38	-	432.38
Arrowtooth flounder	352.13	-	352.13
Pollock	321.10	-	321.10
Rockfish	-	160.00	160.00
Atka mackerel	-	135.16	135.16
Pelagic			
Pollock	22,914.66	2,866.50	25,781.16
Pot			
Pacific cod	9,494.75	516.32	10,011.07
Hook-and-line			
Pacific cod	2,037.89	322.17	2,360.06
Sablefish	226.11	-	226.11
Jig			
Pacific cod	171.18	-	171.18

For the years 2003 to 2010, federal and parallel fishery catch within the GOA area of the critical habitat greatly outweighs the catch within the BSAI. For both regions, Pollock pelagic trawl had the most catch (22,914 mt GOA and 2,866 mt BSAI). In the GOA, Pacific cod pot fishing followed (9,494 mt), then Pacific cod long line (2,037 mt), and Pacific cod non-pelagic trawl (1,503 mt). In the BSAI, Pacific cod non-pelagic trawl had the second highest catch (1,166 mt). Table 5 shows the catch within critical habitat in the BSAI and GOA in greater detail by providing catch by reporting area.

Table 5 Catch (mt) within critical habitat by reporting area for target fisheries with greater than 100 mt in the critical habitat from 2003 to 2010

Target fishery with > 100 mt catch in critical habitat from 2003–2010	Total catch (mt) (2003–2010) in critical habitat by reporting area
Non-pelagic	
Pacific cod	
509	*
512	0
516	0
518	63.03
519	226.78
541	363.03
542	504.19
543	*
610	1249.22
620	*
630	243.55
Shallow-water flatfish	
610	*
620	193.50
630	235.72
Arrowtooth flounder	
610	*
620	49.49
630	301.38
Pollock	
610	*
620	148.44
630	164.37
Rockfish	
509	0
512	0
516	0
518	*
519	0
541	*
542	149.26
543	*
Atka mackerel	
509	0
512	0
516	0
518	7.33
519	18.05
541	*
542	109.66
543	0
Pelagic	
Pollock	
509	21.16
512	*
516	123.48
518	0

Target fishery with > 100 mt catch in critical habitat from 2003–2010	Total catch (mt) (2003–2010) in critical habitat by reporting area
519	2700.52
541	*
542	*
543	0
610	13,789.42
620	3865.99
630	5259.25
Pot	
Pacific cod	
509	*
512	0
516	0
518	*
519	348.49
541	25.18
542	109.27
543	*
610	7646.47
620	953.50
630	894.78
Hook-and-line	
Pacific cod	
509	0
512	0
516	0
518	7.55
519	210.04
541	34.35
542	44.17
543	25.76
610	456.91
620	159.82
630	1421.16
Sablefish	
610	66.67
620	77.84
630	81.60
Jig	
Pacific cod	
610	117.90
620	1.64
630	51.64

*Data not provided due to confidentiality.

Table 6 shows federal reporting areas by the most significant fisheries (greater than 100 mt from 2003 to 2010).

Table 6 Fisheries greater than 100 mt from 2003 to 2010 within critical habitat

	Bering Sea/Aleutian Islands					Gulf of Alaska		
Fisheries >100 mt from 2003–2010	543	542	541	519	516	610	620	630
Non-pelagic								
Pacific cod		B	A	A		C		A
Shallow-water flatfish							A	A
Arrowtooth flounder								A
Pollock							A	A
Rockfish		A						
Atka mackerel		A						
Pelagic								
Pollock				C	A	E	C	D
Pot								
Pacific cod		A		A		D	B	B
Hook-and-line								
Pacific cod				A		A	A	C
Jig								
Pacific cod						A		

A = 100–500 mt B=501–1,000 mt C=1,001–5,000 mt D=5,001–10,000 mt E=10,001–14,000 mt

The BSAI and GOA reporting areas 542, 519, 610, 620 and 630 experienced the most catch in critical habitat from 2003 to 2010. The fisheries with the greatest catch are Pollock pelagic fishing and Pacific cod pot, pelagic and non-pelagic trawling, and hook and line. However, these catches do not reflect the 2011 Steller sea lion protection measures (discussed under *Section 6.0 Environmental baseline* and *Appendix B*).

The 2011 Steller sea lion protection measures included Pacific cod closures in the Aleutian Islands and resulted in reduced Pacific cod catches in reporting areas 541 and 542 and nearly complete closures of Steller sea lion critical habitat. In terms of indirect impacts on the SWDPS of the northern sea otter through potential damage to critical habitat, due to the nature of the gear type, non-pelagic Pacific cod trawling may have a greater possibility for impact to the critical habitat than pelagic trawling, pot or hook-and-line fishing, and non-pelagic trawling for Pacific cod is greatest in the GOA reporting area 610 and BSAI reporting area 542 based on 2003 to 2010 data. However, the fisheries in these areas are a small percentage of the overall fishery activity and Pacific cod trawling has been further restricted in reporting area 542 based on the 2011 Steller sea lion protection measures.

The amount of effort occurring inside critical habitat is relatively small compared to overall effort in the groundfish fishery. Table 7 compares the 2010[23] catch for the target fisheries with greater than 100 mt within critical habitat by reporting area for the years 2003 to 2010 to the total 2010 catch for these target fisheries within reporting areas.

[23] 2010 was chosen since it is the most recent year of catch data used in this analysis.

Table 7 Percent catch in 2010 only for target fisheries (greater than 100 mt catch in critical habitat from 2003 to 2010) within critical habitat

Target fishery with > 100 mt catch in critical habitat from 2003–2010	Total number of vessels (2010) in critical habitat by reporting area	Total number of vessels (2010) by reporting area	% vessels operating in critical habitat compared to reporting area	Total catch (2010) in critical habitat by reporting area	Total catch (2010) by reporting area	% total catch in critical habitat compared to reporting area
Non-pelagic						
Pacific cod						
509	0	35	0	0	11,437.37	0
512	0	0	0	0	0	0
516	0	*	-	0	515.04	0
518	0	0	0	0	0	0
519	*	7	-	*	-	-
541	20	31	64	25.67	10,371.54	.25
542	13	16	81	5.66	823.56	.69
543	*	6	-	*	-	-
610	8	16	50	26.63	2066.83	1.29
620	0	19	0	0	2055.40	0
630	12	38	32	99.88	13,107.80	.76
Shallow-water flatfish						
610	0	0	0	0	0	0
620	3	10	30	27.46	1222.12	2.25
630	6	25	24	10.91	9795.87	.11
Arrowtooth flounder						
610	*	*	-	*	-	-
620	*	9	-	*	-	-
630	6	27	22	103.94	13,514.75	.77
Pollock[24]						
610	0	0	0	0	0	0
620	4	8	50	48.25	1458.22	3.31
630	*	10	-	*	-	-
Rockfish						
509	0	0	0	0	0	0
512	0	0	0	0	0	0
516	0	0	0	0	0	0
518	0	0	0	0	0	0
519	0	*	-	0	71.25	0
541	*	8	-	*	-	-
542	3	6	50	15.51	2824.94	.55
543	0	6	0	0	5017.03	0

[24] Pollock data is collected under two target fisheries codes. These two codes have two separate vessel counts. For the purposes of this table, the highest number between the two codes was presented to prevent duplication of vessels. Thus, numbers provided represent the minimum number of vessels fishing for Pollock.

Target fishery with > 100 mt catch in critical habitat from 2003–2010	Total number of vessels (2010) in critical habitat by reporting area	Total number of vessels (2010) by reporting area	% vessels operating in critical habitat compared to reporting area	Total catch (2010) in critical habitat by reporting area	Total catch (2010) by reporting area	% total catch in critical habitat compared to reporting area
Atka mackerel						
509	0	0	0	0	0	0
512	0	0	0	0	0	0
516	0	0	0	0	0	0
518	0	0	0	0	0	0
519	0	0	0	0	0	0
541	*	8	-	*	-	-
542	3	9	33	3.27	30,762.15	.011
543	0	8	0	0	22,775.01	0
Pelagic						
Pollock[25]						
509	0	89	0	0	88,523.17	0
512	0	0	0	0	0	0
516	0	0	0	0	0	0
518	0	0	0	0	0	0
519	16	28	57	201.98	10,446.48	1.93
541	*	*	-	*	-	-
542	0	0	0	0	0	0
543	0	0	0	0	0	0
610	24	26	92	1492.64	28,622.80	5.22
620	31	38	82	542.30	27,051.95	2.01
630	31	39	79	519.54	15,736.14	3.30
Pot						
Pacific cod						
509	0	23	0	0	5629.46	0
512	0	0	0	0	0	0
516	0	0	0	0	0	0
518	0	0	0	0	0	0
519	12	25	48	40.23	10,087.12	.40
541	*	*	-	*	-	-
542	3	3	100	22.48	514.66	4.37
543	*	*	-	*	-	-
610	43	51	84	1740.53	10,759.12	16.18
620	17	26	65	180.32	1560.86	11.55
630	47	52	90	165.58	8169.00	2.03

[25] Pollock data is collected under two target fisheries codes. These two codes have two separate vessel counts. For the purposes of this table, the highest number between the two codes was presented to prevent duplication of vessels. Thus, numbers provided represent the minimum number of vessels fishing for pollock.

Target fishery with > 100 mt catch in critical habitat from 2003–2010	Total number of vessels (2010) in critical habitat by reporting area	Total number of vessels (2010) by reporting area	% vessels operating in critical habitat compared to reporting area	Total catch (2010) in critical habitat by reporting area	Total catch (2010) by reporting area	% total catch in critical habitat compared to reporting area
Hook-and-line						
Pacific cod						
509	0	18	0	0	10,234.53	0
512	0	*	-	0	132.40	0
516	0	5	0	0	310.54	0
518	0	4	0	0	138.93	0
519	8	13	62	9.55	606.14	1.58
541	10	10	100	4.98	3000.01	.17
542	4	7	57	3.17	2452.84	.13
543	4	4	100	1.34	4049.86	.03
610	22	28	76	213.24	7461.71	.03
620	19	23	83	21.65	5255.83	.41
630	58	75	77	168.54	4968.80	3.39
Sablefish						
610	13	60	22	.66	1556.66	.04
620	5	28	18	1.70	350.77	.49
630	11	121	9	3.38	2916.59	.12
Jig						
Pacific cod						
610	34	48	71	63.52	322.97	20.0
620	7[26]	6	100	.004	0	0
630	37	92	40	7.71	103.56	7.45

*Data not provided due to confidentiality.

Percentage of catch by fishery are grouped by percentage and presented by reporting area in Table 8.

[26] Data discrepancy (more vessels in critical habitat than the reporting area) is due to the process of linking vessels to reporting area. In this case, the extra jig vessel may have been accounted for on the boundary of two reporting areas and apportioned to 620. Appendix A describes the VOE-CIA database used to apportion groundfish catch data to a spatial resolution.

Table 8 Catch in 2010 only for target fisheries (greater than 100 mt catch in critical habitat from 2003 to 2010) within critical habitat

	Bering Sea/Aleutian Islands					Gulf of Alaska		
Fisheries >100 mt from 2003–2010	543	542	541	519	516	610	620	630
Non-pelagic								
Pacific cod		A	A	A		B		A
Shallow-water flatfish							B	A
Arrowtooth flounder								A
Pollock							C	A
Rockfish		A						
Atka mackerel		A						
Pelagic								
Pollock				B		D	B	C
Pot								
Pacific cod		C		A		E	E	B
Hook and line								
Pacific cod				A				B
Jig								
Pacific cod						E		

A < 1.0% B = 1.0–3.0% C=3.1–5.0% D=5.1–10% E=10.1–20%

In terms of the percentage of catch for a fishery within critical habitat to the rest of the reporting area, jig fishing for Pacific cod in the GOA, pot fishing for Pacific cod in the GOA, and Pelagic trawl fishing for Pollock in the BSAI and GOA have higher percentages. The jig fishery has overall very small levels of catch and few vessels fishing within critical habitat. In terms of the direct impacts of these fisheries on the SWDPS of the northern sea otter, pelagic trawling and jig fishing rarely contact the sea floor and thus are likely having little impact on the critical habitat. Pot fishing impacts habitat where pots contact with the sea floor. While fishing operations may occasionally come into contact with sea otters, there is no documented evidence to suggest that pelagic trawling or jig fishing would disturb sea otters. As discussed under *Section 5.4.1 Incidental take*, the incidental takes of sea otters in 1992 in groundfish pot gear were isolated and highly unusual events, thus pot fishing is also extremely unlikely to disturb sea otters or result in incidental take and the likelihood of take is discountable.

While not as illustrative as catch amounts, fishing vessel presence can also be used as an indicator of potential direct impact of fisheries on the SWDPS of the northern sea otter and its critical habitat. Table 7 presents the number of vessels by reporting area in critical habitat in 2010 for those target fisheries with greater than 100 mt catch in critical habitat from 2003 to 2010. These results show a wide range of variability, with some reporting areas experiencing the same number of vessels in critical habitat as the reporting area as a whole. For example, number of vessels fishing in critical habitat compared to the entire reporting area was the same for Pacific cod pot directed fishing in reporting area 542, Pacific cod hook-and-line directed fishing in 541 and 543,[27] and Pacific cod jig directed fishing in 620. Others had no fishing in critical habitat, such as Atka mackerel non-pelagic trawl directed fishing in 543[28] and Pacific cod non-pelagic trawl directed fishing in 620. The highest vessel count in critical habitat for 2010 was 58 vessels in reporting area 630 for the hook-and-line directed fishing for Pacific cod followed by 47 vessels

[27] The 2011 Steller sea lion protection measures have closed reporting area 543 to directed fishing for Atka mackerel and Pacific cod, so these potential impacts on sea otter critical habitat have been eliminated for these directed fisheries.

[28] Ibid.

in reporting area 630 for directed pot fishing for Pacific cod. This compares to a total of 75 vessels in 2010 reporting area 630 for hook-and-line Pacific cod directed fishing and 52 vessels for pot Pacific cod directed fishing.

While these vessel counts indicate fishing activity by vessel within critical habitat, a more representative indication of fishing effort would be the amount of catch within critical habitat (see discussion above), as the presence of a vessel in the critical habitat does not indicate duration or the amount of fishing activity within critical habitat. Fishing vessels may travel into critical habitat, but may conduct most of their fishing in other areas of the federal reporting areas, as indicated in the last column of Table 7. Thus, while there may be vessels fishing within critical habitat, for the majority of the fisheries the small amount of catch in critical habitat demonstrates that there is little actual fishing activity occurring in this area and the impact on prey availability is discountable.

5.4.8 Incidental catch of potential sea otter prey in groundfish fisheries

In addition to the potential direct impact of fishing operations on sea otters and the impact on critical habitat, the indirect impacts of fishing gear on sea otters through the incidental catch of sea otter prey must also be considered. Non-target catch in the groundfish fisheries is one way to estimate the amount of potential sea otter prey collected in fishing operations.

Estimates of non-target catch in CAS rely on at-sea data collected by the North Pacific Groundfish Observer Program. NMFS observers stationed on vessels report non-target species catch that is brought on board. This data is extrapolated to the non-observed fleet to reflect estimated catch by fishery. The data is then linked to location through the VOE-CIA database. Due to the relatively small area differentiated as critical habitat, catch amounts do not exactly represent catch within this designated habitat area, but provides an estimated catch of species in and around the designated area. This process is described further in *Appendix A*.

In order to assess the impact of groundfish fishing on sea otter prey, non-target species under the North Pacific Groundfish Observer Program were matched with those observed as prey in the 2003 study conducted in the Adak area (Funk 2003) (Table 9). Since the USFWS identified slow-moving benthic invertebrates as potential sources of sea otter prey, a couple of additional non-target categories were included: hermit crab unidentified and snails (USFWS 2010). Also, the non-target categories of polychaete unidentified, invertebrate unidentified, and misc. crustaceans were also included as they could represent a variety of potential prey items. “Misc. fish,” one of the categories in Funk (2003), was not included since the range of potential fish species is so great. Also, crab recorded under “non-target” species would be State only managed stocks; the GOA and BSAI Groundfish FMPs prohibit the retention of king crab and Tanner crab species caught in the groundfish fishery. Octopus is a groundfish managed species, and thereby not recorded as a non-target species.

Table 9 Funk (2003) observed sea otter prey linked to NMFS non-target species

Identified in Funk (2003) study	NMFS Non-target group name	Included in non-target analysis
Sea urchin	Urchins, dollars, cucumbers	X
Rock jingle	Bivalves	X
Bivalve, unidentified	Bivalves	X
Clam	Bivalves	X
Sand lance	Pacific sand lance	X
Crab	Misc. crabs	X
Annelid worm	Misc. inverts (worms etc.)	X
Echiurid worm	Misc. inverts (worms etc.)	X
Lump sucker	-	
Sea cucumber	Urchins, dollars, cucumbers	X
Starfish	Sea star	X
Chiton	-	
Sand dollar	Urchins, dollars, cucumbers	X
Fish, unidentified	-	
Sponge	Sponge unidentified	X
Algae/kelp	-	
Barnacle	-	
Fish egg mass	-	
Cockle	Bivalves	X
Sculpin	Other sculpins and large sculpins	X
Limpet	-	
Mollusk	Bivalves	X
Algal holdfast	-	
Octopus	-	
Sea anemone	Sea anemone unidentified	X
Mussel	Bivalves	X
Flatfish	-	
Rock greenling	Greenling	X
Brittle Star	Brittlestar unidentified	X
Worm, unknown	Misc. inverts (worms etc.)	X
	Snails	X
	Hermit crab, unidentified	X
	Polychaete unidentified	X
	Invertebrate unidentified	X
	Misc. crustacean	X

Across all fisheries and gear types, approximately 831.25 mt of potential sea otter prey, within the categories indicated in Table 9, was caught from 2003 to 2010 within critical habitat. Of these gear types, pot had the highest catch (688.38 mt), followed by hook-and-line (85.49 mt), non-pelagic trawl (55.90 mt), and pelagic trawl (1.48 mt). The highest quantities caught in the pot fishery were large sculpins (226.77 mt), sea stars (422.37 mt), and other sculpins (32.43 mt). All other incidental catch in the pot fishery was less than three mt by non-target species category from 2003 to 2010.

The following quantities of the top sea otter prey items as categorized under the appropriate non-target group name were caught: bivalves (0.29 mt); misc. crabs (non-prohibited species catch and non-federal fisheries) (1.44 mt); and sea urchins, dollars, cucumbers (0.40 mt).

Those fisheries with the highest groundfish catches within the critical habitat are provided below with incidental catch of potential sea otter prey by gear type for 2003 to 2010.

Table 10 Potential sea otter prey caught by gear type[29] (2003–2010)

Gear type	Quantity caught (mt)
Non-pelagic trawl	
Atka mackerel (BSAI)	2.92
Pollock (GOA)	0.32
Pacific cod (GOA)	12.63
Rockfish (BSAI)	1.08
Arrowtooth flounder (GOA)	0.77
Shallow-water flatfish (GOA)	14.67
Pelagic trawl	
Pollock (GOA & BSAI)	1.48
Pot	
Pacific cod (BSAI & GOA)	687.98
Hook-and-line	
Pacific cod (BSAI & GOA)	77.01
Sablefish (GOA)	0.15

In addition, since sea otters have been observed to eat fish, species caught in the groundfish fisheries are also potentially sea otter prey. Of the specific non-crab species listed in Funk (2003) as observed sea otter prey (lumpsucker, Pacific sand lance, octopus, rock greenling, sculpin), only sculpin (253.80 mt) and octopus (150.11 mt) are NMFS-recorded stocks that have been caught in critical habitat.

Top sea otter prey items are caught in very small quantities in the federal and State parallel groundfish fisheries. For example, fisheries caught only 0.40 mt of the non-target group of sea urchins, dollars, cucumbers from 2003 to 2010. In terms of gear types, pot gear had the highest bycatch of potential sea otter prey (sculpins and sea stars). However, this bycatch is not likely to have a measureable effect on prey resources as they represent a small amount of the total prey spread over a large area and the eight-year time span analyzed.

5.4.9 Effect of groundfish fisheries on the SWDPS of the northern sea otter and critical habitat

The potential impact of federal and State parallel groundfish fisheries, direct (incidental take or disturbance by fishing vessels) or indirect (impact on prey resources), were discussed in the preceding sections. Results are summarized below.

[29] Data on incidental catch by jig gear is not available in the CAS.

Direct effects:

Incidental take: As discussed under *Section 5.4.1Incidental take*, the most recent documented incidental takes of sea otter takes in the groundfish fisheries occurred in the 1990s. There have been no takes since that time and no evidence to suggest there would be future takes. Because past takes were infrequent and isolated events and there have been no documented takes in recent years, the likelihood of incidental take of the SWDPS of the northern sea otter is discountable.

Disturbance: Fisheries catch within critical habitat was greater in the GOA than the BSAI; the highest fishery catch within GOA critical habitat from 2003 to 2010 was the Pollock pelagic trawl fishery, followed by Pacific cod pot fishing. Although in some cases there was spatial overlap between total number of vessels fishing in and outside of critical habitat as can be seen by the percentage of fishery catch within the critical habitat compared to outside of critical habitat, for the most part these fisheries operate in deeper waters than the critical habitat or where sea otters have been predominately observed to occur; there is no evidence to suggest that federal and State parallel fisheries operations are disturbing the SWDPS of the northern sea otter. Thus, the BSAI and GOA groundfish FMP fisheries are not likely to adversely affect the SWDPS of the northern sea otter.

Indirect effects:

Habitat impact: The most predominant fishery in the critical habitat, the midwater, pelagic trawling for Pollock, has at most a very minor potential impact on critical habitat and potential prey resources. The gear type with the highest potential for impacting sea floor habitat, non-pelagic trawl, has a relatively minor presence in critical habitat. Those areas of critical habitat that may be deep enough to support non-pelagic trawling are also subject to time and area fishery restrictions and closures as detailed in *Appendix B*. Thus, federal and State parallel fishing in critical habitat are not significantly impacting critical habitat.

Potential prey: The CAS database suggests that a very small amount of potential sea otter prey is captured in non-pelagic trawling. Of the groundfish gear types, the CAS database suggests that pot gear had the highest catch of potential prey, primarily sculpins and sea stars, which are only two of the many potential sea otter prey types. This data suggests that federal and State parallel fishing in critical habitat are not significantly impacting potential sea otter prey.

The draft recovery plan for the SWDPS of the northern sea otter also states that there is little, if any, competition between humans and sea otter for prey within the range of the SWDPS of the northern sea otter and that the decline in the central and western Aleutian Islands was unrelated to the abundance of prey resources (USFWS 2010). The data presented in this analysis supports the conclusion that impacts, if any, are insignificant.

5.5 Analysis of impact from halibut fishing

The impact of halibut fishing of the SWPDS of the northern sea otter is primarily limited to the potential disturbance by fishing vessels since there have been no observed takes of sea otters in halibut fishing operations; halibut fishing also does not target a sea otter prey item, nor does the hook-and-line gear type tend to impact critical habitat or catch sea otter prey as bycatch (see *Section 5.4.2*). Although there are no estimates of non-target catch for the commercial halibut fishery in the CAS,[30] the longline or hook-and-

[30] In October 2010, the Council took final action to restructure the Observer Program and the new program was implemented as Amendment 86 to the BSAI Groundfish FMP and Amendment 76 to the GOA Groundfish FMP on January 1, 2013 (77 FR 70062, November 21, 2012). The restructured observer program removes exemptions

line type gear used in halibut fishing halibut vessels is not likely to catch significant amounts of potential sea otter prey (Table 10).

As in *Section 5.4* for groundfish, halibut fisheries catch effort in critical habitat is used as a proxy for the potential degree of disturbance to sea otters. The preliminary 2012 estimates for commercial harvests indicate 11,649 thousand pounds caught in area 3A, 4,954 in area 3B, and 5, 511 in area 4. Halibut sport fishing is much less common in the western Gulf of Alaska and Bering Sea due to the relative remoteness of the ports. In Areas 3A, 3B, and 4, there is a daily bag limit of two halibut for the guided and unguided fisheries. In 2012 the sport fishery harvested 3,938 thousand pounds in area 3A, 13 in area 3B, and 16 in area 4 (Gilroy 2013).

Direct effects: While halibut fishing vessels may come into contact with sea otters, there is no documented evidence to suggest that the longline or hook-and-line fishing would disturb sea otters. There have been no recorded takes of sea otters in the halibut fisheries and thus the likelihood of incidental take of the SWDPS of the northern sea otter is discountable.

Indirect effects: Although there are no non-target catch estimates for the halibut fisheries, hook-and-line gear or longline gear likely does little damage to critical habitat and is likely catching limited amounts of potential sea otter prey. Thus, the halibut fisheries are likely not having a measureable effect on sea otters, critical habitat, or prey availability and the effect is insignificant.

6.0 Environmental baseline

The environmental baseline is the "the past and present effects of all federal, state, or private activities in the action area, the anticipated effects of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the effect of State or private actions which are contemporaneous with the consultation in process" (50 CFR 402.02, definition of "effects of the action"). Federal activities are discussed in *Section 5.0 Effects of federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries on the SWDPS* of the northern sea otter. Fisheries management measures, past and present State commercial fishing operations, and State-regulated seafood wastewater discharges are discussed below in relation to the potential impact on the SWDPS of the northern sea otter and critical habitat.

6.1 BSAI and GOA fisheries management measures

The implications of the 2011 Steller sea lion protection measures on federal and State parallel fisheries catch within critical habitat are discussed below. These and additional federal fishery management measures are discussed under *Appendix B*.

from observer coverage for halibut vessels and for groundfish vessels less than 60 ft LOA and implements a randomized observer deployment process to improve the probability that unbiased information on catch and bycatch can be collected. Deployment methods for 2013 (Annual Deployment Plan: ADP) were finalized in January 2013 and posted on the Alaska Region website (NMFS 2013).

6.1.1 Steller sea lion protection measures

Since January 1, 2011, federal and State parallel groundfish fisheries in the Aleutian Islands have been subject to time and area closures in response to the reasonable and prudent alternative (RPA) in the 2010 Biological Opinion for authorization of groundfish fisheries under the BSAI Groundfish FMP (NMFS 2010a).

The RPA in the Biological Opinion was structured to mitigate effects of the fisheries in locations where the western distinct population segment of Steller sea lion abundance continues to decline (Areas 543, 542, and 541) and where available information indicates that reproduction may be reduced to a level that cannot support recovery. The 2010 Biological Opinion determined that the weight of evidence indicates that fisheries for Steller sea lion prey may be appreciably reducing the reproduction and thus numbers of Steller sea lions and adversely modifying the conservation value of their critical habitat in Areas 543, 542, and 541 by removing large quantities of prey species important to Steller sea lions for basic nutrition and reproductive capacity. Specific closures and timing are detailed in the interim final rule published on December 13, 2010 (75 FR 77535), and in Appendix B.

These closures result in a reduction of exposure of the SWDPS of the northern sea otter in the Aleutian Islands to fisheries and potentially a reduction in take of potential prey through fishing activities. For example, in 2011, in the Aleutian Islands federal reporting areas (541, 542, 543), only 6.39 mt of fish were caught in critical habitat solely within the Pacific cod fishery (hook-and-line, non-pelagic trawl, and pot). This compares to 2010 data of 233.80 mt of target species catch of Atka mackerel, Pollock, Pacific cod, rockfish, sablefish, and Arrowtooth flounder.

6.2 State-managed commercial fisheries in or near critical habitat

State-managed fisheries generally occur from 0 to three miles offshore; however, some State-managed fisheries (e.g., Tanner crab) may extend into federal waters. State-managed commercial fisheries in the vicinity of the SWPDS of the northern sea otter are salmon (Chinook, coho, pink, sockeye, chum), herring (sack roe or food/bait), shellfish (Dungeness, Tanner, shrimp, scallops, sea urchins, and sea cucumber) ,[31] as well as groundfish fisheries.

6.2.1 Groundfish

The State of Alaska establishes harvest quotas independent of federal/parallel fisheries for State-waters seasons. State-managed fisheries are controlled by GHLs, which are monitored by the State, and are typically a percentage of the federal acceptable biological catch (ABC). The federal TACs for GOA and BSAI Pacific cod are reduced by the amount needed for the State's GHL for Pacific cod to prevent exceeding the ABC. Currently, the State-managed Pacific cod fishery in the BSAI is allocated 3 percent of the federal ABC. Typically, the State sets the fishery quotas and opens State-managed fisheries after federal fisheries conclude in adjacent waters.

[31] http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/commercial_season_1.pdf

In the ADF&G Westward Region (BSAI, Kodiak, Chignik, and South Alaska Peninsula), there are State-waters seasons for sablefish, black rockfish, dark rockfish[32], lingcod, and Pacific cod. State-waters seasons for Pacific cod and sablefish are prosecuted exclusively within state waters (Hartill et al. 2013).

Sablefish

GOA

In the GOA, sablefish may only be retained with certain restrictions as bycatch to other commercial groundfish fisheries. The 2011 sablefish bycatch harvest totaled 11,253 pounds (Hartill et al. 2013).

BSAI

When NMFS implemented the IFQ program, the State of Alaska established two minor fisheries in Cook Inlet and the Aleutian Islands for fishermen that were not allowed to participate in the IFQ program. These fisheries are managed using a GHL, which is determined based on harvest history, fishery performance, and the federal survey for the area. The Aleutian Islands State fishery allows longline, pot, jig, and hand troll gear (ADF&G website). Since 1995, vessels using longline gear account for an average of 90 percent of the sablefish harvest. Harvests have ranged from a low of 157,250 pounds in 2008 to a high of 477,970 pounds in 2002. Although GHLs remained relatively high since 2002, the GHL has not been fully harvested and harvests currently range from 150,000 to 300,000 pounds. In 2011, the harvest was 210,718 pounds with 28 participating vessels (Hartill 2012).

Rockfish

GOA

Black rockfish is the only species in the pelagic shelf rockfish assemblage with directed fisheries in State waters. In 2011, the Kodiak Area black rockfish GHL was 175,000 pounds and a total of 21 vessels harvested 124,900 pounds of black rockfish. The 2011 Chignik black rockfish GHL was 100,000 pounds, and a single vessel participated in the fishery resulting in confidential harvest information. Since 2006, the eastern district of the South Alaska Peninsula Area black rockfish GHL has been set at 75,000 pounds and a single vessel participated in the fishery resulting in confidential harvest information (Hartill et al. 2013).

BSAI

Since 1998, the Aleutian Islands black rockfish area includes all State waters of the Aleutian Islands south of Cape Sarichef and west of Scotch Cap Light, and all federal waters of the Pacific Ocean between Scotch Cap Light and 170° W longitude. Since 1999, the GHLs for the Akutan and Unalaska sections have been 35,000 pounds and the area west of 168° W long has been 20,000 pounds. Over the last 16 years, most black rockfish harvest (64 percent) has come from the Akutan Section, while less than one percent of overall black rockfish harvest has come from the western area. Handlines and mechanical jigging machines are the only legal gear types (Hartill 2012).

Lingcod

The South Alaska Peninsula Area is believed to be the western boundary of lingcod distribution range. Historically, harvests of lingcod in the ADF&G Westward Region have generally remained below 100,000 pounds and most harvest occurs as bycatch in other commercial groundfish fisheries (Hartill et al. 2013).

[32] There is no directed fishery for dark rockfish, and catch is limited to bycatch from other fisheries.

Pacific cod

GOA

The State of Alaska Board of Fisheries (BOF) developed unique State-waters Pacific cod management plans for fisheries in the Kodiak, Chignik, and South Alaska Peninsula groundfish areas that defined season dates, legal gear types, GHL allocation and rollover provisions, vessel registrations requirements, and gear storage regulations for each management area. Allowable gear types (pot and jig gear) and gear limits (60 pots and 5 jig machines) are the same across the management plans. To accommodate the 2012 change in federal management from derby style fisheries to individual gear sector allocations, in 2011, the BOF modified the Pacific cod management plans to coordinate State-water and federal seasons by changing opening dates to coincide with the closure of the applicable federal gear sector.[33] In addition, if a GHL has not been taken with the closure of the federal pot gear sector B season, the State-waters season may reopen to all legal gear types, depending on the amount of GHL remaining (Hartill et al. 2013).

GLHs are set for each management area as a percentage of the annual federal Pacific cod ABC. Since 2003, GHLs from each management area were fixed at 25 percent of the federal ABCs for the South Alaska Peninsula, 12.5 percent for the Kodiak Area, 8.75 percent for the Chignik area, and 3.75 percent for the Cook Inlet Area (Hartill et al. 2013).

The 2011 Kodiak GHL was 14.83 million pounds and pot and jig gear were each allocated 50 percent of the total GHL. Total 2011 harvest of Pacific cod from the Kodiak Area State-waters season was 15.27 million pounds taken by 161 vessels. Pot gear vessels harvested 8.13 million pounds while jig vessels harvested 7.14 million pounds. Notable harvests occurred in Chiniak Bay, Ugak Bay on the eastside of Kodiak Islands, and Izhut Bay on the eastside of Afognak Island (Hartill et al. 2013)

The 2011 Chignik Area GHL was 10.38 million pounds; vessels using pot gear were allocated 90 percent of the GHL, or 9.34 million pounds, and vessels using jig gear were allocated 10 percent, or 1.04 million pounds. The total 2011 Chignik Area State-waters season Pacific cod harvest was 10.34 million pounds taken by 32 vessels. By gear type, 23 pot vessels harvested 10.12 million pounds while 10 jig vessels harvested 224,400 pounds; one vessel used both pot and jig gear. Most harvest occurred around Mitrofania Island, Semidi Islands, and near Chiginagak Bay (Hartill et al. 2013).

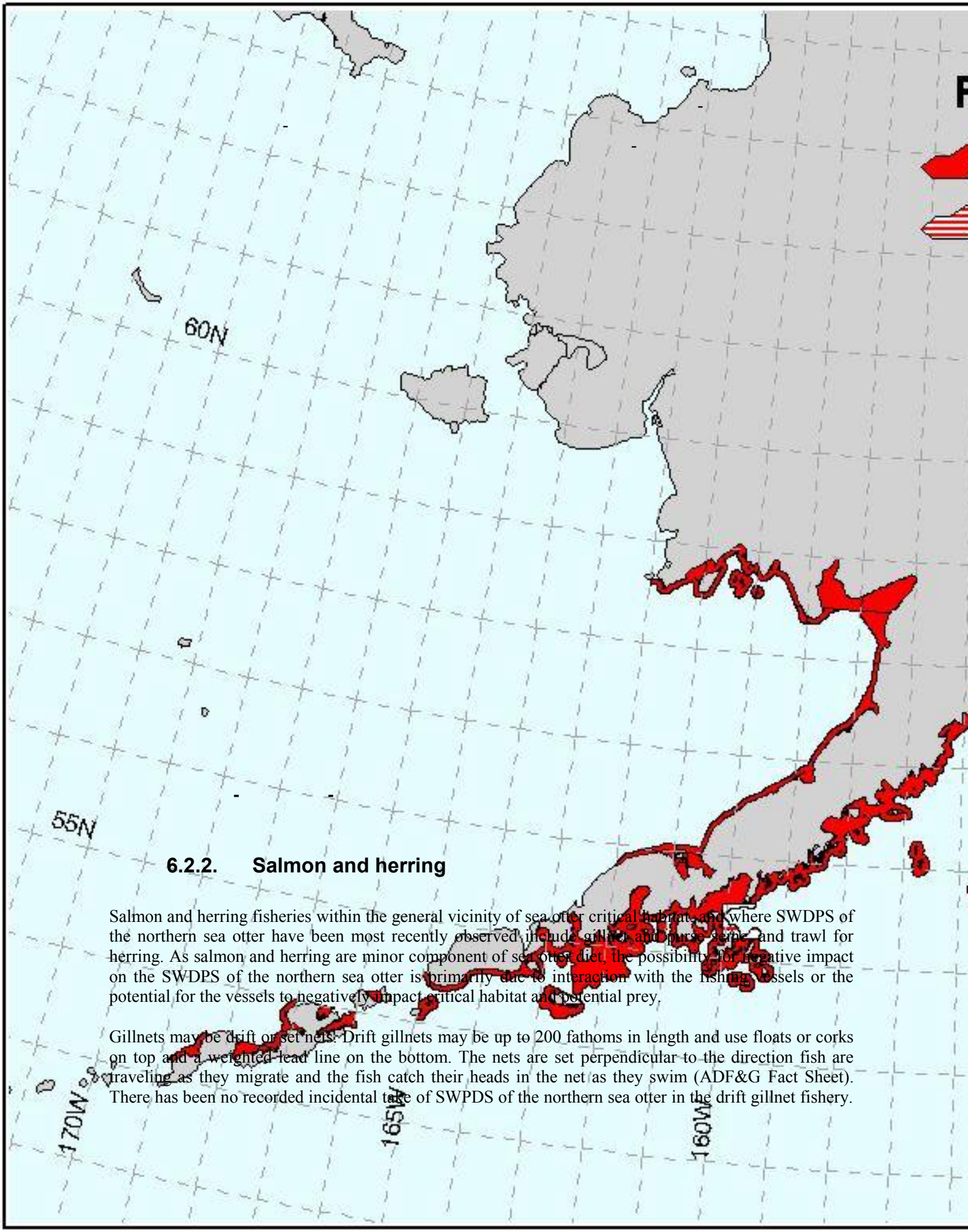
The 2011 South Alaska Peninsula Area GHL was 16.74 million pounds and the total harvest was 16.81 million pounds taken by 82 vessels. Pot vessels harvested 14.36 million pounds while jig vessels harvested 2.44 million pounds; nine vessels used both pot and jig gear. Notable harvests occurred near Sanak Island and around the Shumagin Islands (Hartill et al. 2013).

BSAI

The BOF created the State-waters Pacific cod fishery in the Aleutian Islands District in 2006. The Aleutian Islands District Pacific Cod Management Plan (5 AAC 28.647) defines the season dates, legal gear types, GHL and rollover provision, vessel registration requirements and registration area, trip limits, and closure areas. The GHL is set annually at 3 percent of the federal BSAI ABC. The 2011 GHL was 15,542,430 pounds. During 2011, the GHL was not fully harvested and the fishery closed by regulation on December 31 (Hartill 2012).

State groundfish fishing closures

[33] Amendment 83 to the GOA Groundfish FMP allocates Western and Central GOA Pacific cod TAC limits among various gear and operational sectors (76 FR 74670, December 1, 2011).



6.2.2. Salmon and herring

Salmon and herring fisheries within the general vicinity of sea otter critical habitat, and where SWDPS of the northern sea otter have been most recently observed, include gillnet and purse seine, and trawl for herring. As salmon and herring are minor component of sea otter diet, the possibility for negative impact on the SWDPS of the northern sea otter is primarily due to interaction with the fishing vessels or the potential for the vessels to negatively impact critical habitat and potential prey.

Gillnets may be drift or set nets. Drift gillnets may be up to 200 fathoms in length and use floats or corks on top and a weighted lead line on the bottom. The nets are set perpendicular to the direction fish are traveling as they migrate and the fish catch their heads in the net as they swim (ADF&G Fact Sheet). There has been no recorded incidental take of SWPDS of the northern sea otter in the drift gillnet fishery.

Drift gillnets in Alaska harvest salmon in the water column, rarely contact with the ocean floor, and thus assessed to have a low impact on physical structure, seafloor organisms, shellfish, and crab (Morgan and Chuenpagdee 2003). Some potential sea otter prey may be captured in the drift gillnets, although it is likely a small amount.

Set gillnets are deployed from a skiff and are held onshore or offshore with anchors (ADF&G Fact Sheet). The Alaska Kodiak salmon set gillnet fisheries reported take resulting in mortality of a sea otter through a NMFS self-report in 2002 (USFWS 2010). Entanglements in the Alaska Kodiak salmon set gillnet have also been observed. In 2002, sea otters were observed entangled in four sets and entangled in one set in 2005. Two of the entanglements in 2002 and the one in 2005 were of a short duration, and the sea otters freed themselves unharmed. The two entangled sea otters in 2002 were released unharmed with human assistance (USFWS 2010). The Alaska Kodiak fishery is classified as a Category II fishery under the Marine Mammal Protection Act and generally operates from June 9th until the end of September or early October. Set gillnet gear is legal gear in two districts within the Kodiak Management Area: the Northwest District from Spruce Island to the south side of Uyak Bay and the Alitak Bay District location on the southwestern corner of Kodiak Island. The Kodiak area salmon fishery is managed by ADF&G as a limited entry fishery with gear restrictions on the mesh and net size, and area closures (NMFS b). Set gillnets anchored to the sea floor may have some impact to the habitat for potential prey; however, the incidental take of potential prey is small and the impact on prey habitat is likely not measureable and therefore insignificant.

Purse seines encircle the fish and then a purse line is used to close the bottom of the net, which is then retrieved. Since purse seines harvest in the water column they have insignificant impact to marine habitat. While they could damage kelp beds or benthic structure, these types of impacts also damage the gear itself, so they are typically self-limiting (NPFMC 1998). There have been no recorded incidental takes of the SWDPS of the northern sea otter by this gear type, and there is likely a very low level incidental take of potential sea otter prey in the purse seine fishery.

6.2.3 State shellfish fisheries

State-managed commercial shellfish fisheries that could occur within the general vicinity of sea otter critical habitat and where SWDPS of the northern sea otter have been most recently observed include crab stocks (Dungeness in the GOA and Tanner crab in the BSAI and GOA),[34] shrimp, scallops, sea urchins, and sea cucumber. Giant Pacific octopus may be taken as bycatch or in a directed fishery in designated registration areas and once the guideline harvest level has been reached, the commissioner closes those areas (5AAC 38.150., 5AAC 38.217, 5 AAC 38.417).

BSAI State-managed shellfish

- Aleutian Islands Tanner Crab
  Aleutian Islands Tanner crab is divided into eastern and western districts. The 2010 commercial Tanner crab fishery in the eastern district had a State GHL of 74,000 pounds in the Unalaska/Kalekta Bay Section and 45,000 pounds in the Akutan Section. The minimum GHL for the Makushin/Skan Bay Section was not met and not opened to commercial fishing. Both the Akutan and the Unalaska/Kalekta Bay Sections closed without reaching the GHL. The western district has been closed since 1996/97 (Bowers et al. 2011).

GOA State-managed shellfish

[34] The State-managed western Aleutian Islands red king crab was closed from 2005/2006 to the present.

The predominant commercial shellfish species harvested from in the GOA are Tanner crab, Dungeness crab, and red sea cucumber. There are also small shrimp and green sea urchin fisheries.

- Tanner crab
  Kodiak, South Peninsula, and Chignik are part of the State of Alaska's Westward registration area and are not included in the BSAI Crab FMP. The combined Kodiak District GHL was 700,000 pounds and harvest was 650,315 pounds for 2009/2010. The highest densities of crab were found in the Eastside Section of Kodiak. The combined GHL was 500,000 pounds for the South Peninsula District. The Western Section had a harvest of 228,690 pounds and the Eastern Section had a harvest of 354,512 pounds in 2009/2010 (Sagalkin and Spalinger 2011).

- Dungeness crab
  Dungeness crabs are located in coastal waters predominately in waters less than 50 m deep; there are infrequent Dungeness landings in the eastern Aleutians and along the North Peninsula. The Dungeness fishery uses pots with rigid tunnel openings. There are no pot limits for Dungeness crab fishing in the Westward Region. Only hardshell male Dungeness crabs over 6.5 inches in shell width may be harvested. In 2010, in the South Alaska Peninsula, 0.25 million pounds were harvested and in Kodiak, 1.0 million pounds were harvested (ADF&G website). State commercial fishery regulations are available on the ADF&G website. There has not been any take of the SWDPS of the northern sea otter in the Dungeness crab fishery; however, there was one report of a sea otter drowned in a Dungeness pot in southeast Alaska in 2007 (USFWS 2010). As there are no observer programs in place, any contact with sea otters would be self-reported.

- Sea cucumber
  ADF&G manages fisheries for sea cucumber in the GOA Westward Region (Kodiak, Chignik, and Alaska Peninsula). The red sea cucumber in the Kodiak area is managed under separate GHLs for eight areas that are the same as Tanner crab management areas. The red sea cucumber is harvested in the Kodiak area by hand picking and harvest peaked in 1993 with 564,000 pounds harvested by 50 permit holders. The recent 5-year average is 150,000 pounds with an average of 19 participants (ADF&G website). The presence of divers for short periods of time and the conservative GHLs are not thought to harm sea cucumber populations or impact sea otter foraging (Funk 2003).

- Shrimp
  There is a small shrimp fishery in the Kodiak area managed under the Westward Region Shrimp Management Plan, first approved in 1982. The Plan has minimum biomass thresholds for allowing harvest in some of the historically most productive inshore areas and GHLs are determined based on catch history from trawl surveys. Remaining offshore waters are open by regulation without biomass thresholds, but have supported very little fishing since the 1986-87 season (ADF&G website), thus the shrimp fishery is extremely unlikely to affect sea otters.

- Green sea urchin
  ADF&G manages a small green urchin fishery in Kodiak and the Alaska Peninsula; however, no commercial harvest has occurred since 2001. Green sea urchins are found predominately in the intertidal to depths of 30 feet. The green sea urchin fishery is managed under the authority of a Commissioner's permit for miscellaneous species that details the harvest locations, season length, and guideline harvest levels. Green urchin management in the Kodiak area use boundary lines set for Tanner crab and sea cucumbers, with maximum GHLs of 10,000 and 5,000 pounds depending on historical harvest. Urchins are harvested by hand or using an urchin rake (ADF&G website).

There has been no recent effort, and when open, the small GHLs and low subsistence harvests are not thought to harm sea urchin populations or impact sea otter foraging.

6.3 Seafood waste discharges

Due to the attraction to seafood waste, seafood waste discharges and associated bacteria have the potential to adversely impact marine mammals and birds (USEPA 2009). Seafood discharge piles can also alter benthic habitat, reduce locally associated invertebrate populations, and lower dissolved oxygen levels in overlying waters, which may impact available prey resources and water quality for marine organisms, including seabirds and marine mammals (NMFS 2005b).

The Alaska Department of Environmental Conservation (ADEC) issues permits to control discharges at shore-based seafood processing facilities and floating seafood processors operating in State waters under the Alaska Pollutant Discharge Elimination System (APDES) program. In 2011, ADEC issued an APDES General Permit for Alaska Offshore Seafood Processors (AKG523000) for processors discharging between 0.5 nm and 3 nm from shore. Under the Clean Water Act section 403 as part of this permitting action, an Ocean Discharge Criteria Evaluation was completed to evaluate the potential for unreasonable degradation of marine water as a result of the discharge of pollutants (ADEC 2012). The General Permit authorizes discharge of seafood processing waste, wash-down water, sanitary wastewater, graywater, and other wastewaters, subject to the limitations in the Permit. It further limits the discharge of settleable solid seafood processing waste residues to less than 3.3 million pounds of waste per year at a single location in waters less than 1 nm from shore and requires compliance with the water quality standards for settleable solid seafood processing residues outside of a maximum one acre zone of deposit. Seafood waste discharges may not exceed one half inch (1.27 cm) in any dimension, which is a technology-based requirement commonly known as "grind and discharge."

Waters that were excluded from coverage under the General Permit were based on a number of reasons such as proximity to critical habitat for endangered or threated species, state or federal designated wildlife refuges, or other protected areas. The majority of the specific excluded areas under the permit are discharges to the 1.0 nm buffer zone around sea otter designated critical habitat (ADEC 2012). Excluding critical habitat protects these areas from the potential impacts of discharges on benthic habitat, which may further protect benthic prey species for sea otters. The General Permit and APDES permits specific to seafood processing facilities can be accessed from ADEC's web page.[35]

7.0 Cumulative effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Past and present impacts of non-federal actions are part of the environmental baseline discussed in *Section 4.1.1. Potential causes of SWDPS northern sea otter* and *Section 6.0 Environmental baseline.* Potential future actions that may affect the SWPDS of the northern sea otter include changes in vessel traffic through the Aleutian Islands, State-managed fisheries, subsistence harvest of sea otters, State wastewater regulations, the Pebble Mine project, human population growth, and climate change impacts.

[35] http://www.dec.alaska.gov/

7.1 Vessel traffic and oil and gas

The USFWS has assessed the risk of disturbance as a low threat to recovery due to the wide range of the DPS, as sea otters have thrived in areas with high boat traffic (USFWS 2010). While currently vessel traffic in the Aleutian Islands is low, the Aleutian Islands are along the shortest transportation route for large commercial ships traveling between northwestern North America and Asia. Growth in vessel traffic in the Aleutian Islands is expected to continue for the foreseeable future and increases the risk vessel accidents and spills. Currently, more than 4,500 large commercial vessels pass through Unimak Pass annually (Transportation Research Board 2008).

There is the potential for vessel traffic to increase with potential oil exploration activities in the Arctic. In 2008, President George W. Bush rescinded the executive moratorium on offshore drilling created in 1990 and renewed in 1998. Consequently, areas of the outer continental shelf not previously considered have been opened to offshore drilling. The initial scoping evaluation for the 2012–2017 Five-Year Plan required by the Department of Interior includes areas in the Beaufort Sea, Chukchi Sea, and Cook Inlet. The Outer Continental Shelf Oil and Gas Leasing Program for 2012–2017 establishes a schedule of where and when oil and gas leasing might be appropriate over a 5-year period; the Chukchi Sea and Cook Inlet are scheduled for 2016 and the Beaufort Sea for 2017 (Vann 2011). In addition to the potential increase in vessel disturbance, the increase in vessel traffic that is likely to result from these activities also increases the risk of increased frequency of oil spills.

7.2 Subsistence harvest of sea otters

The current status of subsistence harvest was discussed under *Section 4.1.1. Potential causes of SWDPS northern sea otter*. Although the reported subsistence harvest from the SWDPS of the northern sea otter is the lowest of the three stocks of sea otters in Alaska, as populations decline, harvests may not, thus it may be appropriate to evaluate the possible ramifications of future harvests quantitatively (USFWS 2010).

7.3 State-managed commercial fisheries

State-managed fisheries that could potentially impact the SWDPS of the northern sea otter or its critical habitat are discussed under *Section 6.0 Environmental baseline*. These fisheries may be subject to changes from one fishing season to the next. The Board of Fisheries, established under Alaska Statute 16.05.221, is authorized to adopt regulations for fisheries in State waters to establish open and closed seasons, quotas, bag limits, and fishing methods. The Board of Fisheries meets four to six times a year to consider proposed changes to fisheries regulations. The Board relies on science provided by ADF&G, public comment, and guidance from the Alaska Department of Public Safety and Alaska Department of Law in creating regulations. State of Alaska staff is unaware of any proposed actions that could impact the SWDPS of the northern sea otter of its critical habitat.[36] Regulation announcements, news releases, and updates are available on the ADF&G website.

[36] Personal communication with Nicole Kimball, Federal Fisheries Coordinator, State of Alaska Department of Fish and Game, November 2, 2012.

7.4 Seafood processor discharges

State-regulated seafood waste discharges are discussed under *Section 6.0 Environmental baseline*. ADEC plans to issue a general permit, Coastal Fish Waste Discharge to Marine Waters (AKG521000), in 2013 for shore-based seafood processors discharging in State marine waters. It is also anticipated that in a future permitting action, floating facilities operating in State waters between shore and 0.5 nm from shore will be incorporated into the General Permit for Alaska Offshore Seafood Processors (AKG523000).[37] As in the case for AKG52300, ADEC contacts USFWS for commentary regarding potential impacts to species protected under the ESA. ADEC reviews suggested protective measures and develops site-specific conditions and requirements (ADEC 2012).

7.5 Pebble Mine

The Bristol Bay watershed provides habitat for numerous animal species, supports the largest sockeye salmon fishery in the world, is home to 25 federally recognized tribal governments, and contains large mineral resources. The Nushagak River and Kvichak River watersheds are the largest of the Bristol Bay's watershed's six major river basins and have been identified as mineral development areas by the State of Alaska. The potential for large-scale mining development is greatest for copper deposits, and to a lesser degree, for intrusion-related gold deposits. The Pebble Deposit is the largest known and the most explored deposit for future mining potential and could produce more than 11 billion metric tons of ore, if fully mined. The low grade of the deposits means that mining likely would be conducted over a large area generating a large amount of waste material. The consequences of potential mining activities on the loss and degradation of habitat on fish populations could not be quantified because of the lack of quantitative information concerning salmon, char, and trout populations (USEPA 2012). The potential effects of any future mining activity in Bristol Bay on the SWDPS of the northern sea otter and its potential prey are also unknown at this time.

7.6 Human population growth

While Alaska has the lowest population density of all of the states in the United States, from 2000 to 2009, the state population has grown 1.1 percent annually. In 2009, almost 80 percent of Alaska's population was found in the following five boroughs: Municipality of Anchorage, Fairbanks North Star Borough, Matanuska-Susitna Borough, Kenai Peninsula Borough, and Juneau Borough. The Matanuska-Susitna Borough has experienced the greatest rate of growth: an average of 3.8 percent annually during 2000 to 2009. However, this trend is not occurring in the boroughs bordering the critical habitat; the Aleutians West and the Lake and Peninsula Borough, experienced an average annual net migration rate of less than -2 percent, and -2 percent to 0 percent for the Aleutians East and Kodiak Island from 2000 to 2009, suggesting that while the populations may be increasing overall statewide, populations are decreasing around the critical habitat (State of Alaska 2010). Consequently, human development is not likely to have a significant impact on the SWDPS of the northern sea otter or its critical habitat.

[37] Personal communication with Shawn Stokes, Environmental Manager, Division of Water – Alaska Department of Environmental Conservation, October 9, 2012.

7.7 Climate change

The International Panel on Climate Change (IPCC) states that the observed widespread warming of the atmosphere and ocean, together with ice mass loss, support the conclusion that is extremely unlikely that global climate change of the past 50 years can be explained without external forcing and very likely that it is not due to known natural causes. The IPCC projects a warming of 0.2° C per decade for a range of scenarios. Sea ice is projected to shrink in the Arctic and Antarctic under all scenarios. Both past and future anthropogenic CO^2 emissions will continue to contribute to warming and sea level rise for more than a millennium, due to the time scales required for the removal of this gas from the atmosphere. In the Polar Regions, the main projected biophysical effects are reductions in thickness and extent of glaciers, ice sheets, and sea ice, and changes in natural ecosystems with detrimental effects on many organisms including migratory birds, mammals, and higher predators (IPCC 2007).

The USFWS maintains that it is difficult to anticipate how climate change will affect sea otter recovery and that monitoring relevant indices will be important to assess how climatic changes will impact sea otters (USFWS 2010). Among other impacts, climate change could affect sea otter prey availability. For example, one result of increasing atmospheric carbon dioxide levels could be increased ocean acidification that could affect the exoskeleton formation in sea otter prey species such as bivalves, snails, and crabs (Green et al. 2004).

8.0 Conclusions

This analysis has evaluated the potential effect of the following FMPs on the SWDPS of the northern sea otter and its critical habitat: BSAI Groundfish, GOA Groundfish, BSAI Crab, Scallop, and Salmon, as well as the halibut fisheries in U.S. Convention waters off Alaska. The following information was considered in assessing the impact of federal and State parallel fisheries, State-managed fisheries with federal oversight, and joint federal/State-managed fisheries on the SWDPS of the northern sea otter and its critical habitat:

1) There is no evidence to suggest that sea otters are being disturbed or, in the future, will be disturbed by fishery operations. Previous takes of sea otters are isolated, anomalistic incidents that occurred in the 1980s and 1990s; there have been no recorded observations of takes in the recent past ,and there is no evidence to suggest that takes would occur in the future. Thus, the potential for takes of the SWDPS of the northern sea otter is discountable.

2) Most fisheries catch is outside of the designated critical areas where deeper water allows for groundfish trawling and targeting of the deeper water crab species through the pot fisheries.

3) While some fishing is occurring within critical habitat, target species are not the primary sources of sea otter prey, and in cases where sea otters do eat the target species (e.g., crabs), the primary focus of the fishery is generally outside of the sea otter's range and critical habitat, thus having little if any impact on their prey source or the ocean floor habitat. In addition, the most predominant fishing in the critical habitat (pelagic trawl) is likely not having a measureable impact on the critical habitat and potential prey.

4) The FMPs require adherence to federal laws and regulations that consider the impact of fisheries on habitat, non-target species, and marine mammals.

5) The USFWS suggests that killer whales, rather than food limitation, is the cause of the increase in sea otter mortality.

Based on this analysis, the Alaska federally managed fisheries authorized by the fishery management plans and State of Alaska parallel groundfish fisheries and halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the SWDPS of the northern sea otter or its designated critical habitat.

9.0 Contributors and persons consulted

Contributors

Ellgen, Sarah, NFMS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Gasper, Jason, NMFS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Lewis, Steve, NMFS, Alaska Region, Analytical Team, Juneau, Alaska.

Persons consulted

Aberle, Gabrielle, NMFS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Brown, Melanie, NMFS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Harrington, Gretchen, NMFS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Keaton, Josh, NMFS, Alaska Region, Sustainable Fisheries, Juneau, Alaska.

Miller, Scott, NMFS, Alaska Region, Analytical Team, Juneau, Alaska.

10.0 References

ADF&G website: http://www.adfg.alaska.gov.

ADF&G Fact Sheet. What kind of fishing boat is that? ADF&G Division of Commercial Fisheries, Juneau, AK.

ADEC. 2012. Fact Sheet Modifications #1 Modifications of an Alaska Pollutant Discharge Elimination System (APDES) permit for Alaska Offshore Seafood Processors General Permit. Alaska Department of Environmental Conservation, Wastewater Discharge Authorization Program, 555 Cordova Street, Anchorage, AK 99501.

Bowers, F.R., M. Schwenzfeier, K. Herring, M. Salmon, J. Shaishnikoff, H. Fitch, J. Alas, and B. Baechler. 2011 Annual Management Report for the Commercial and Subsistence Shellfish Fisheries of the Aleutian Islands, Bering Sea and Westward Region's Shellfish Observer

Program, 2009/10. Alaska Department of Fish and Game, Fishery Management Report No. 11-05, Anchorage, AK.

Cahalan, J., J. Mondragon, and J. Gasper. 2010. Catch sampling and estimation in the federal groundfish fisheries off Alaska. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-AFSC-205.

DeAlterus, J., Skrobe, and L. Lipky, C. 1990. The significance of seabed disturbance by mobile fishing gear relative to natural processes: a case study in Narragansett Bay, Rhode Island. In Fish Habitat; Essential Fish Habitat and Rehabilitation, American Fisheries Society Symposium 22. Available from: http://www.fishingnj.org/artdealter.htm.

Freese , L., P.J. Auster, J. Heifetz, and B.L. Wing. 1999. Effects of trawling on seafloor habitat and associated invertebrate taxa in the Gulf of Alaska. Marine Ecology Progress Series 182: 119-126.

Funk, F. 2003. Overview of state-managed marine fisheries in Southwestern Alaska with reference to the Southwest stock of sea otters. Alaska Department of Fish and Game, Juneau, AK.

Gilroy, H. 2013. The Pacific halibut fishery, 2012. 2013 IPHC Annual Meeting Handout. Available from: http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2013.pdf.

Green, M.A., M.E. Jones, C.L. Boudreau, R.L. Moore, and B.A. Westman. 2004. Dissolution mortality of juvenile bivalves in coastal marine deposits. Limnology and Oceanography 49:3 727-734.

Hartill, T. 2012. Annual management report for the Bering Sea-Aleutian Islands area State-waters groundfish fisheries and groundfish harvest from parallel seasons in 2011. Fishery Management Report No. 12-38. Divisions of Sport Fish and Commercial Fisheries, Alaska Department of Fish and Game.

Hartill, T., Converse, P., and Philips, K. 2013. Annual Management Report for Groundfish Fisheries in the Kodiak, Chignik, and South Alaska Peninsula Management Areas, 2011. Fishery Management Report No. 12-52. Divisions of Sport Fish and Commercial Fisheries, Alaska Department of Fish and Game.

Hatfield, B.B, Ames, J.A., Estes, J.A., Tinker, M.T., Johnson, A.B., Staedler, M.M., and Harris, M.D. 2011. Sea otter mortality in fish and shellfish traps: estimating potential impacts and exploring possible solutions. Endangered Species Research 13: 219-229.

Heifetz, J., R.P. Stone, and S.K. Shotwell. 2009. Damage and disturbance to coral and sponge habitat of the Aleutian Archipelago. Marine Ecology Progress Series 397:295-303.

Himes Boor, G.K. and R.J. Small. 2012. Steller sea lion spatial-use patterns derived from a Bayesian model of opportunistic observations. Marine Mammal Science. Doi: 10.1111/j.1748-7692.2011.00541.x.

IPHC. 2013. Pacific Halibut fishery regulations 2013. IPHC. Seattle, WA.

IPCC. 2007. Climate Change 2007: Synthesis Report An assessment of the Intergovernmental Panel on Climate Change.

Malecha, P.W., R.P. Stone, and J. Heifetz. 2005. Living substrate in Alaska: distribution, abundance, and species associations. In: Barnes PB, Thomas JP (ed) Benthic habitats and the effects of fishing. American Fisheries Society Symposium 41:289–299.

McConnaughy, R.A., K.L. Mier, and C.B. Dew. 2000. An examination of chronic trawling effects on soft-bottom benthos of the eastern Bering Sea. ICES Journal of Marine Sciences 57: 1377-1388.

Mecum, D. 2006a. Letter to Ann Rappoport, U.S. Fish and Wildlife Service. Anchorage, Alaska. February 23, 2006.

Mecum, D. 2006b. Letter to E. LaVerne Smith, Assistant Regional Director, U.S. Fish and Wildlife Service. Anchorage, Alaska. May 25, 2006.

Morgan, L.E. and R. Chuenpagdee. 2003. Shifting gears: addressing the collateral impacts of fishing methods in U.S. waters. PEW Science Series. Island Press Publication Series. Washington DC.

NMFS(a). Website: http://www.alaskafisheries.noaa.gov/regs/default.htm.

NMFS(b).Website: http://www.nmfs.noaa.gov/pr/pdfs/fisheries/2011final/ak_kodiak_salmon_set_gillnet_final.pdf.

NMFS. 2003. North Pacific Groundfish Observer Program Overview 2001. National Marine Fisheries Service, Resource Ecology and Fisheries Management Division, Alaska Fisheries Science Center, Seattle, WA.

NMFS. 2005a. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. Appendix B Evaluation of Fishing Activities That May Adversely Affect EFH. National Marine Fisheries Service, Juneau, AK. Available from: http://www.alaskafisheries.noaa.gov/habitat/seis/final/Volume_II/Appendix_B.pdf.

NMFS. 2005b. Final Environmental Impact Statement for Essential Fish Habitat identification and conservation in Alaska. Appendix G Non-Fishing Impacts to Essential Fish Habitat and Recommended Conservation Measures. National Marine Fisheries Service, Juneau, AK. Available from: http://www.alaskafisheries.noaa.gov/habitat/seis/final/Volume_II/Appendix_G.pdf.

NMFS. 2010a. Endangered Species Act – Section 7 Consultation Biological Opinion. Authorization of groundfish fisheries under the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. National Marine Fisheries Service, Alaska Region, Juneau, AK. Available from: http://www.alaskafisheries.noaa.gov/protectedresources/stellers/esa/biop/final/1210.htm.

NMFS. 2010b. Revisions to the Steller Sea Lion Protection Measures for the Bering Sea and Aleutian Islands Management Area Groundfish Fisheries, Environmental Assessment/Regulatory Impact Review. National Marine Fisheries Service, Juneau, AK. Available from: http://www.alaskafisheries.noaa.gov/analyses/ssl/sslprotections_earir1210.pdf.

NMFS. 2013. 2013 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. Alaska Fisheries Science Center and Alaska Regional Office, Juneau, AK. Available from: http://www.fakr.noaa.gov/sustainablefisheries/observers/ADP_Final_2013.pdf.

NPFMC. 1998. Essential Fish Habitat Assessment Report for the Salmon Fisheries in the EEZ off the Coast of Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2000. Ecosystem Considerations for 2001. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2006a. Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2006 Crab Safe. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2006b. FMP for the Scallop Fishery off Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2007. Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2007 Crab Safe. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2008. Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2008 Crab Safe. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2011a. FMP for Bering Sea/Aleutian Islands King and Tanner Crabs. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2011b. Stock Assessment and Fishery Evaluation Report for the King and Tanner Crab Fisheries of the Bering Sea and Aleutian Islands Regions 2011 Crab SAFE. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2012a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2012b. Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2012c. Stock Assessment and Fishery Evaluation Report for the Weathervane Scallop Fishery Off Alaska. North Pacific Fishery Management Council, Anchorage, AK. Available from: http://www.alaskafisheries.noaa.gov/npfmc.

NPFMC. 2012d. Fishing Fleet Profiles. North Pacific Fishery Management Council, Anchorage, AK.

Rooper, C.N, M.E. Wilkins, C.S. Rose, and C. Coon. 2011. Modeling the impacts of bottom trawling and the subsequent recovery rates of sponges and corals in the Aleutian Islands, Alaska. Continental Shelf Research 31:1827-1834.

Rose, C.S. and E.M. Jorgensen. 2005. Spatial and temporal distributions of bottom trawling off Alaska: Consideration of overlapping effort when evaluating the effects of fishing on habitat. In: Barnes PB, Thomas JP (ed) Benthic habitats and the effects of fishing. American Fisheries Society Symposium 41:679-690.

Sagalikin, N.H. and Spalinger, K. 2011. 2010Annual Management Report for Shellfish Fisheries in the Kodiak, Chignik, and Alaska Peninsula Areas, 2010. Alaska Department of Fish and Game, Divisions of Sport Fish and Commercial Fisheries.

State of Alaska. 2010. Department of Labor and Workforce Development. Alaska Population Overview 2009 Estimates.

Transportation Research Board of the National Academies. 2008. Risk of Vessel Accidents and Spills in the Aleutian Islands Designing a Comprehensive Risk Assessment. National Academy of the Sciences, Transportation Research Board Special Report 293, Washington DC.

USEPA. 2012. An Assessment of Potential Mining Impacts on Salmon Ecosystems of Bristol Bay, Alaska Executive Summary. Environmental Protection Agency, External Review Draft EPA 910-R-12-004d, Seattle, WA.

USEPA. 2009. Final Biological Evaluation for the General NPDES Permit for Offshore Seafood Processors in Alaska Permit No. AK-G52-4000. U.S. EPA, Region 10, 1200 Sixth Avenue, Seattle, WA 98101.

USFWS. 2010. Southwest Alaska Distinct Population Segment of the Northern Sea Otter (*Enhydra lutris kenyoni*) - Draft Recovery Plan. U.S. Fish and Wildlife Service, Region 7, Anchorage, AK.

Vann, A. 2011. Offshore oil and gas development: legal framework. CRS Report for Congress. Congressional Research Service.

Woodby, D., D. Darlile, S. Siddeek, F.Funk, J.H. Clark, and L. Hulbert. 2005. Commercial fisheries of Alaska. Alaska Department of Fish and Game, Special Publication No. 05-09, Anchorage, AK.

Appendix A

The Vessel Monitoring System-Observer Enabled Catch-in-Areas (VOE-CIA) database is designed to increase the spatial resolution of groundfish fishery data contained in the NMFS, Alaska Region, Catch Accounting System (CAS). The CAS database contains landings information for all federal groundfish fisheries, including estimates of at-sea discard, a full accounting of retained catch, and associated temporal and spatial data. At-sea discard information is almost solely derived from onboard observers that collect at-sea samples and document fishing characteristics. This discard information is extrapolated to the unobserved fleet using ratio estimation methods. For a full description of estimation methods see Cahalan et al. (2010).

Evaluation of the potential impacts on sea otter critical habitat required estimation of catch at a finer spatial resolution then is available in CAS. As a result, the VOE-CIA was the best tool available to provide estimates of catch within critical habitat. The VOE-CIA database integrates catch data from CAS into a GIS database. This database intersects fishery data in CAS onto a grid (composed of many grid squares) that encompasses the entire GOA and BSAI, from the shore to 200 nm. The VOE-CIA provides estimates of catch and effort for each grid square (Grid ID), which is approximately seven kilometers square.

The VOE-CIA integrates information in CAS with the NOAA Office of Law Enforcement's vessel monitoring system (VMS) database. The data in the VMS system is derived from vessel-specific latitude and longitude information that can be used to derive fishing locations and fishing activity, based on vessel speed. The vessel-specific nature of the VMS data allows individual fishing trips to be merged with VMS location information and at-sea observer data (if available) from the North Pacific Groundfish Observer Program. In all situations, the VOE-CIA is simply apportioning CAS information to a fine spatial resolution and not creating estimates of total catch different from those in CAS.

The VOE-CIA relies on an algorithm to apportion CAS catch information into a fine spatial resolution based on the best available spatial data. The algorithm has four different spatial matches that depend on available spatial and vessel characteristics:

1) vessels with VMS and onboard observers provides the highest spatial resolution;
2) unobserved VMS equipped catcher vessels;
3) unobserved VMS equipped catcher processors; and
4) an extrapolation process for fishing vessels that were unmatched in the first three processes. This process is called average vessel.

Observed vessel with VMS

Observed deploy and retrieve points are captured by Catch Accounting reference and then the VMS related points that fall between the observed deploy and retrieve times are captured. A GIS process created a complex polyline that is based on the retrieval and deployment coordinates for each haul or set on an observed trip. The polyline represents the distance traveled for each haul and intersected onto the Grid IDs. The length of this line is calculated for each haul in each Grid ID and the catch is apportioned into the Grid IDs for that haul based on line length in each Grid ID covered in that haul.

Unobserved catcher vessels and unobserved catcher/processors

For unobserved catcher vessels and catcher/processors, catch is attributed to a Grid ID based on a vessel meeting three criteria. First, vessel speed is calculated along time-ordered series VMS tracks to determine if the speed lies between 0.9 knots and 4.2 knots. A vessel meeting this criterion is determined to be fishing. Second, a vessel must be operating in one of the State statistical areas they reported on their

current trip, and third, the date range of the catch data must match the VMS points. Catch is not apportioned to the grid unless all three match.

Average vessel

Any catch that is not matched in the above processes is matched under the average vessel process. Catch is matched by extrapolations by similar vessels in the same area. In the first extrapolation grouping, vessels are matched by harvest sector, target fishery, gear type, NMFS Reporting Area, and week ending date. Vessels not matching the first extrapolation groupings are most often matched when the requirement for the same week ending date is replaced by month and year along with the other grouping variables.

This process results in a match of 99.78 percent of the catch of the CAS and the Catch-In-Areas database is designed to fully manage data for confidentiality.

Time in grid

For observed vessels, the VMS-Observed line as explained in Observed Vessel with VMS (above) is used to calculate 30 minutes for every two nautical miles traveled while fishing. For unobserved vessels, every VMS point captured when the vessel is fishing (see Unobserved catcher vessels and unobserved catcher/processors) is counted as 30 minutes. Under the current analysis, time spent in pot gear fishing was treated the same as would be spent in other types of fishing.

Appendix B

Fisheries closures are defined at 50 CFR 679.22. Closures and fishing restrictions in the Aleutian Islands, Bering Sea, and Gulf of Alaska are described below. These restrictions can be grouped by category into Steller sea lion protection measures, habitat conservation areas, or other types of restrictions.

I. Aleutian Islands

A. Steller Sea Lion Protection Measures

Since much of the critical habitat of the SWPDS of the northern sea otter in federal reporting Areas 543, 542, and 541 falls within Steller sea lion critical habitat, the recommended preferred alternative (RPA), Alternative 4 from the 2010 EA: *Revisions to the Steller Sea Lion Protection Measures for the Bering Sea and Aleutian Islands Management Area Groundfish Fisheries,* is presented below (NMFS 2010b). The measures presented in the RPA have been in effect since January 1, 2011 (75 FR 77535, December 13, 2010).

In Area 543:

- Prohibit retention of Atka mackerel and Pacific cod by all federally permitted vessels.
- Establish a TAC for Atka mackerel sufficient to support the incidental discarded catch that may occur in other target groundfish fisheries (e.g., Pacific ocean perch).
- Eliminate the Atka mackerel platoon management system in the Harvest Limit Area (HLA).

In Area 542:

Groundfish

- Close waters from 0–3 nm around Kanaga Island/Ship Rock to directed fishing for groundfish by federally permitted vessels.

Pacific cod

- Close 0–6 nm zone of critical habitat year round to directed fishing for Pacific cod by federally permitted vessels using nontrawl gear. For vessels 60 ft or greater, close critical habitat from 6 nm–20 nm January 1 to March 1, to directed fishing for Pacific cod using nontrawl gear by federally permitted vessels.
- Between 177° E to 178° W longitude, close critical habitat from 0–20 nm year round to directed fishing for Pacific cod by federally permitted vessels using trawl gear.
- Between 178° W to 177° W longitude, close critical habitat from 0–10 nm year round to directed fishing by federally permitted vessels using trawl gear. Between 178° W to 177° W longitude, close critical habitat 10 nm–20 nm June 10 to November 1, to directed fishing for Pacific cod using trawl gear by federally permitted vessels.
- Prohibit directed fishing for Pacific cod by all federally permitted vessels from November 1 to January 1. (This extends the trawl gear restriction to nontrawl gear.)

- Reinitiate ESA consultation if the nontrawl harvest of Pacific cod exceeds 1.5 percent of the BSAI Pacific cod acceptable biological catch (ABC) (equivalent to the Area 542 maximum annual harvest amount from 2007 through 2009). Similarly, reinitiate ESA consultation if the trawl harvest of Pacific cod exceeds 2 percent of the BSAI Pacific cod ABC (equivalent to the Area 542 maximum annual harvest amount from 2007 through 2009).

Atka mackerel

- Set TAC for Area 542 to no more than 47 percent of the ABC amount apportioned to Area 542 by the Council's SSC.
- Between 177° E to 179° W longitude and 178° W to 177° W longitude, close critical habitat from 0–20 nm year round to directed fishing for Atka mackerel by federally permitted vessels.
- Between 179° W to 178° W longitude, close critical habitat from 0–10 nm year round to directed fishing for Atka mackerel by federally permitted vessels. Between 179° W and 178° W longitude, close critical habitat from 10 nm–20 nm to directed fishing for Atka mackerel by federally permitted vessels not participating in a harvest cooperative or fishing a CDQ allocation.
- Add a 50:50 seasonal apportionment to the CDQ Atka mackerel allocation to mirror seasonal apportionments for Atka mackerel harvest cooperatives.
- Limit the amount of Atka mackerel harvest allowed inside critical habitat to no more than 10 percent of the annual allocation for each harvest cooperative or CDQ group. Evenly divide the annual critical habitat harvest limit between the A and B seasons.
- Change the Atka mackerel seasons to January 20 to June 10 for the A season and June 10 to November 1 for the B season.
- Eliminate the Atka mackerel platoon management system in the HLA.

<u>In Area 541</u>:

Pacific cod

- Close 0–10 nm of critical habitat year round to directed fishing for Pacific cod by all federally permitted vessels.
- Limit the amount of catch that can be taken in the 10 nm–20 nm area of critical habitat based on gear type used:
    - Close critical habitat 10 nm–20 nm January 1 to March 1 to directed fishing for Pacific cod using nontrawl gear by federally permitted vessels.
    - Close critical habitat 10 nm–20 nm June 10 to November 1 to directed fishing by for Pacific cod using trawl gear by federally permitted vessels.
- Prohibit directed fishing for Pacific cod by federally permitted vessels November 1 to January 1. (This extends this trawl gear restriction to non-trawl gear.)
- Reinitiate ESA consultation if the nontrawl harvest of Pacific cod exceeds 1.5 percent of the BSAI Pacific cod ABC (equivalent to the Area 541 maximum annual harvest amount from 2007 through 2009). Similarly, reinitiate ESA consultation if the trawl harvest of

Pacific cod exceeds 11.5 percent of the BSAI Pacific cod ABC (equivalent to the Area 541 maximum annual harvest amount from 2007 through 2009).

Atka mackerel

- Change the Bering Sea/Area 541 Atka mackerel seasons to January 20 to June 10 for the A season and June 10 to November 1 for the B season.
- Close the Bering Sea subarea year round to directed fishing for Atka mackerel.

Season openings and closings are generally done at 12:00 noon for easier implementation in the daylight, rather than at the end of a calendar day at midnight. Figure 13 shows the Pacific cod and Atka mackerel trawl fishery closures in the Aleutian Islands. The RPA provides each fishery a one degree area in the eastern portion of Area 542 for fishing inside the 10-nm to 20-nm zone of critical habitat.

Federally permitted vessels participating in the State-managed GHL fishery (5 AAC 28.647) are exempt from the Atka mackerel and Pacific cod closures under this alternative. The State applies the 2003 Steller sea lion protection measures to this fishery. This would provide for continued harvest in this fishery, as analyzed in the cumulative effects of the FMP biological opinion (NMFS 2010a).

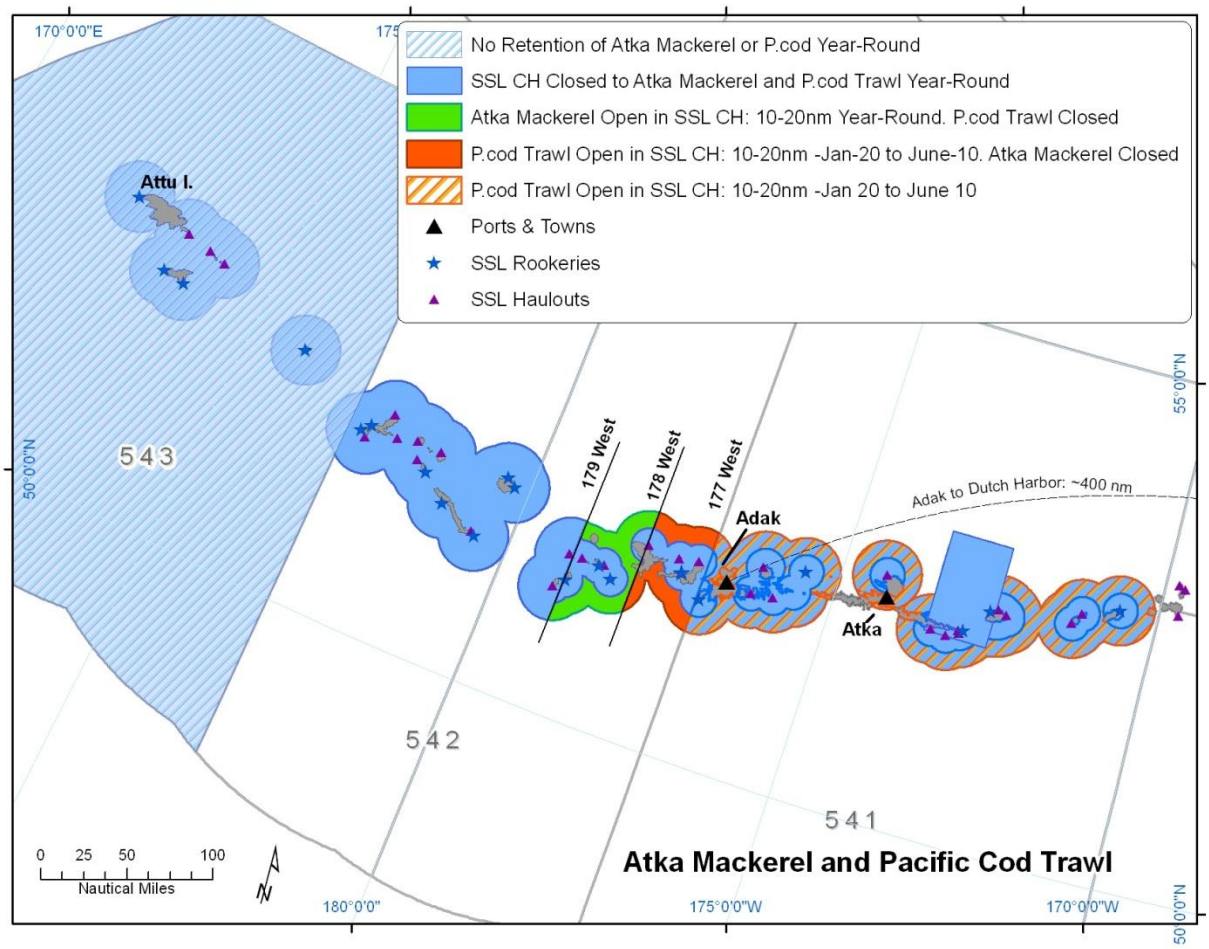


Figure 13 Atka mackerel and Pacific cod trawl fisheries Steller sea lion protection measures

In reporting Area 542, trawl harvests of Atka mackerel and Pacific cod inside critical habitat are limited to a one degree longitude zone of 10-nm to 20-nm of critical habitat. Because of the existing Aleutian Islands Habitat Conservation Area, the actual fishable area is much less than the entire 10-nm to 20-nm zone of critical habitat in these one degree longitude zones (Figure 14).

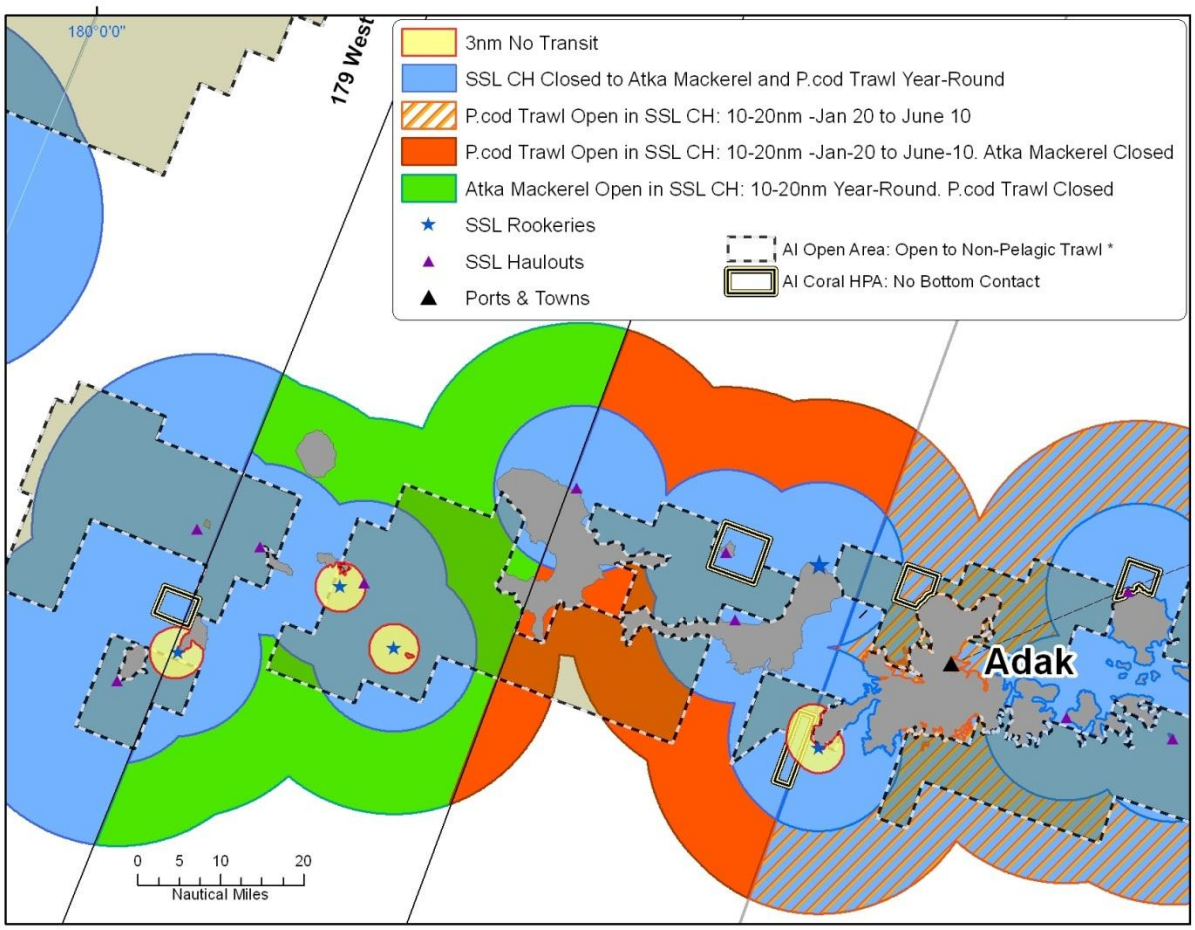


Figure 14 Atka mackerel and Pacific cod trawl areas in Area 542 critical habitat

Atka mackerel fishing inside of critical habitat in Area 542 is limited to participants in a cooperative or in Western Alaska Community Development Quota (CDQ) fishing. Under the RPA, the Atka mackerel fishery inside critical habitat in Area 542 is limited to no more than 10 percent of a cooperative or CDQ group's annual allocation. The 10 percent allocation is evenly divided between the A and B seasons. Requiring participation in a cooperative or in CDQ fishing is necessary to facilitate the management of fishing within the 10 percent and seasonal limits under the RPA, as these participants are able to work together to harvest within their cooperative or CDQ allocations and the regulations would prohibit exceeding the 10 percent limit.

The RPA allows additional critical habitat area to be available to the non-trawl Pacific cod fishery (Figure 15). Hook-and-line vessels are restricted to shallower areas with long distances for setting gear. Most of the available habitat for this gear type is within 7 nm of shore in Area 542. Allowing fishing in critical habitat from 6 nm to 20 nm provides access to fishable areas but still provides protection to the 0 nm to 6 nm areas of critical habitat, which is more likely to be used by Steller sea lions (NMFS 2010a).

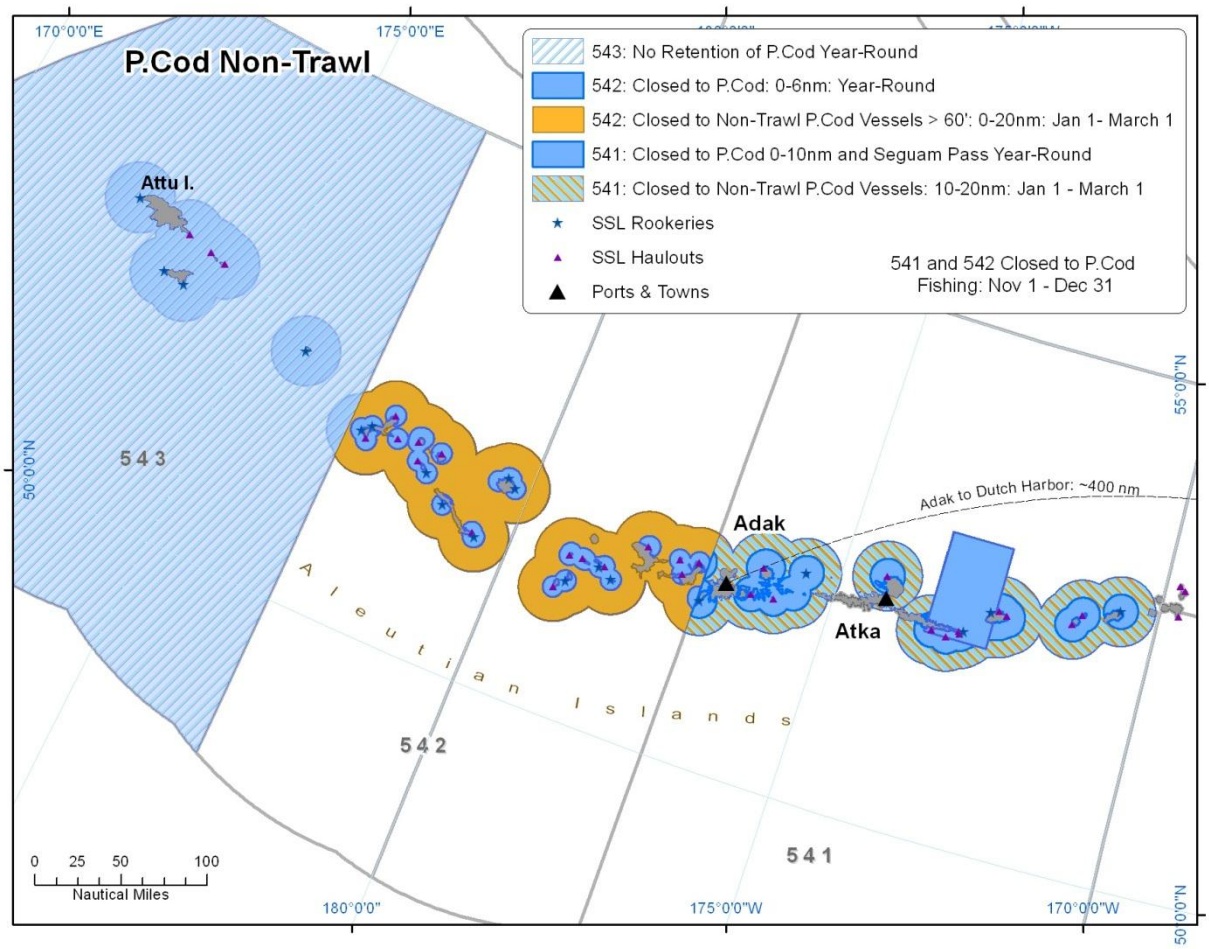


Figure 15 Pacific cod non-trawl fisheries Steller sea lion protection measures

Areas 542 and 541 have reinitiation triggers for the annual harvest of Pacific cod in each area. Because Pacific cod is specified BSAI wide and is allocated to various sectors, it is not possible to establish area and sector specific limits on Pacific cod harvest in the regulations. These reinitiation triggers are necessary to ensure that future harvest in excess of historical Pacific cod harvest would be examined under an ESA consultation to determine if the increase harvest is of a concern to ESA-listed species. The industry will be aware of these reinitiation triggers and will likely fish in a manner not to exceed these values for the nontrawl and trawl sectors so that reinitiation of consultation will not be needed. These triggers are intended to address any potential shift in fishing resulting from the closure of Area 543, discouraging the concentration of Pacific cod harvest in Areas 542 and 541.

B. Habitat Conservation Areas

a. Bowers Ridge Habitat Conservation Zone: No federally permitted vessel may fish with mobile bottom contact hear in the Bowers Ridge Habitat Conservation Zone (Figure 16), as described in Table 25 to § 679.

b. Aleutian Islands Coral Habitat Protection: No federally permitted vessel may fish with bottom contact gear in the Aleutian Islands Coral Habitat Protection Areas (Figure 16), as described in Table 23 to § 679.

c. Aleutian Islands Habitat Conservation Area: Except for those areas identified as opened to nonpelagic trawl gear fishing in Table 24 to 679, no federally permitted vessel may fish with nonpelagic trawl gear in the Aleutian Islands Habitat Conservation Area (Figure 16), as described in Table 24 to § 679.

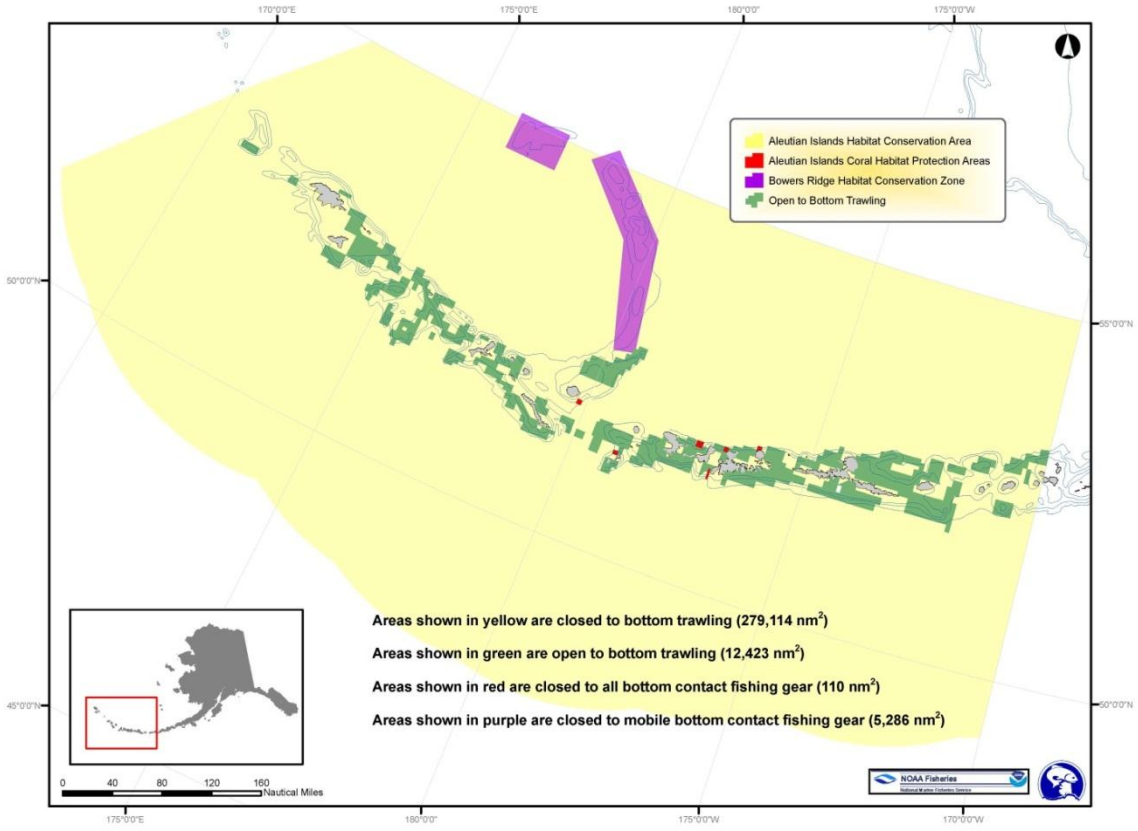


Figure 16 Aleutian Islands Habitat Conservation Areas

II. Bering Sea

A. Steller sea lion protection measures

Steller sea lion protection measures are provided at § 679.22 and mapped in Figure 17.

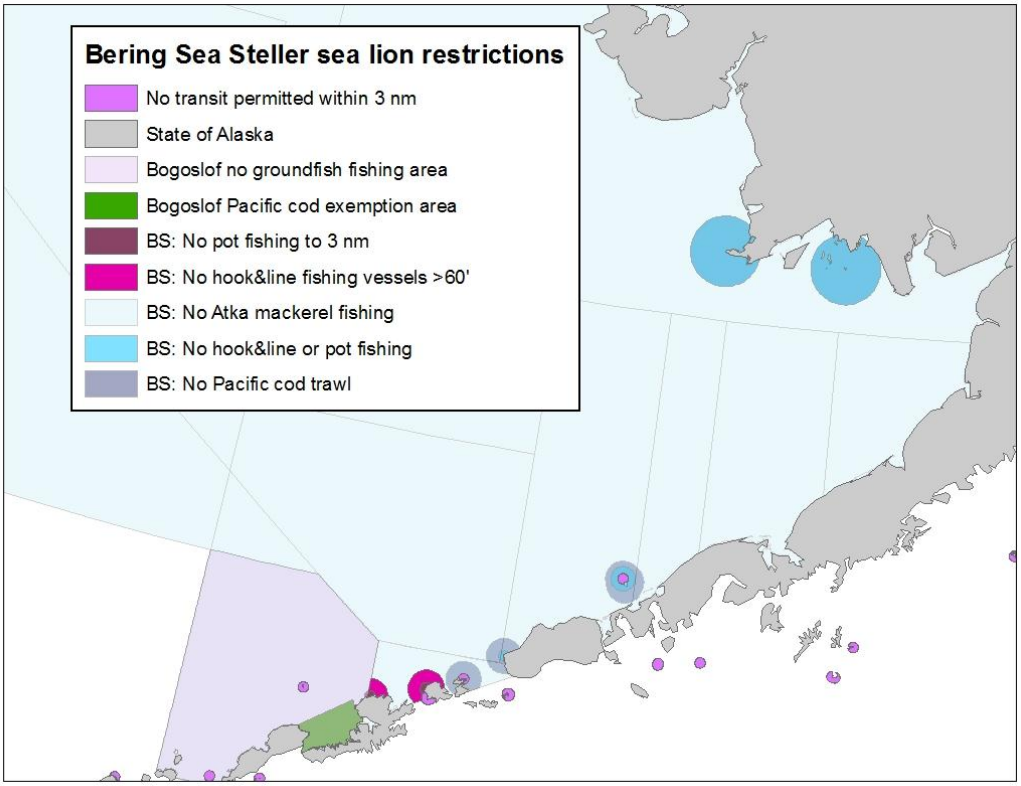


Figure 17 Bering Sea Steller sea lion restrictions

B. Other closures

a. Bering Sea Pollock Restriction Area: All waters within the Bering Sea Pollock Restriction Area are closed during the A season, as defined at § 679.23(e)(2), to directed fishing for Pollock by vessels named on a Federal Fisheries Permit under § 679.4(b).

b. Catcher Vessel Operational Area: A catcher/processor vessel authorized to fish for BSAI Pollock under § 679.4 is prohibited from conducting directed fishing for Pollock in the CVOA during the B Pollock season defined at § 679.23(e)(2)(ii), unless it is directed fishing for Pollock CDQ.

c. Red King Crab Savings Area (RKCSA): Directed fishing for groundfish by vessels using trawl gear other than pelagic trawl gear is prohibited at all times, except as provided at § 679.21(e)(3)(ii)(B), in that part of the Bering Sea subarea defined as RKCSA. (Figure 18)

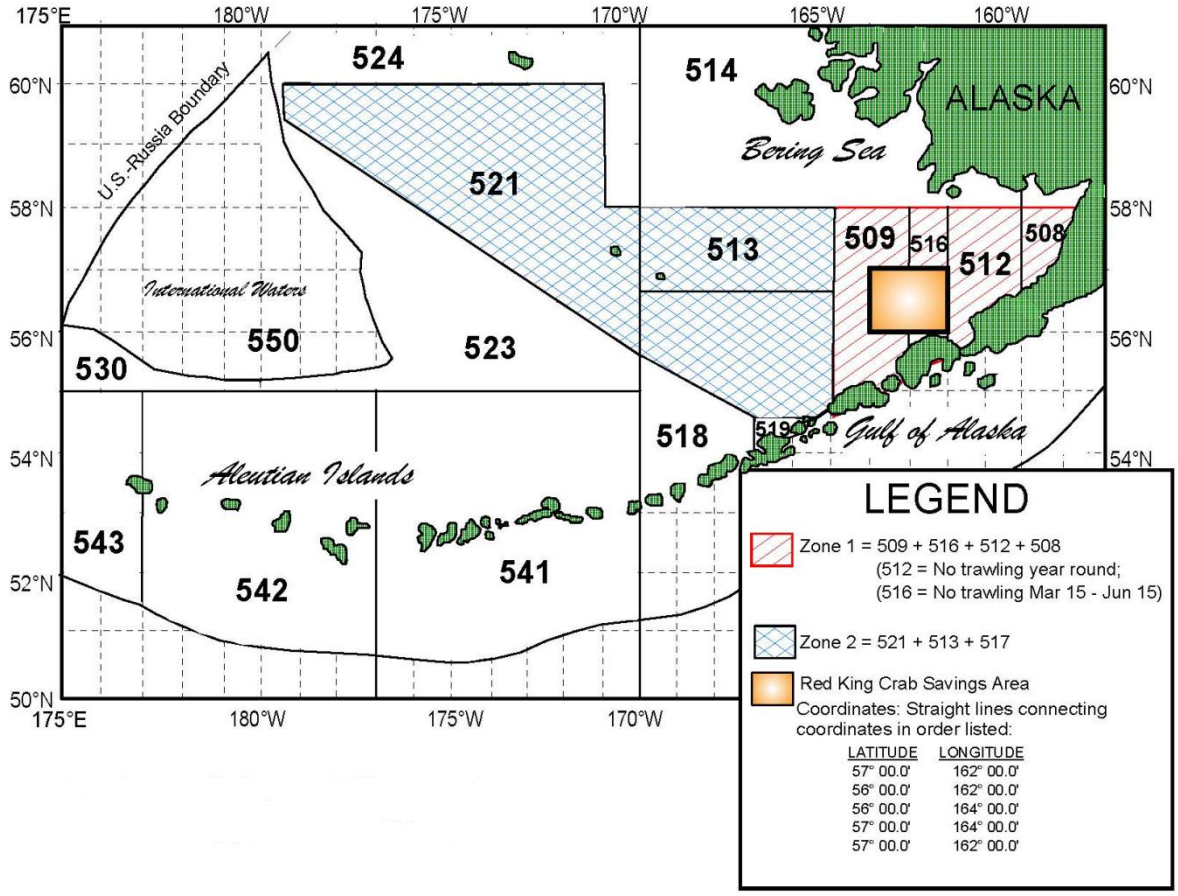


Figure 18 Red King Crab Savings Area

d. Near Shore Bristol Bay Trawl Closure : Directed fishing for groundfish by vessels using trawl gear in Bristol Bay, as described in the current edition of NOAA chart 16006, is closed at all times in the area east of 162° 00' W longitude, except that the Nearshore Bristol Bay Trawl Area

defined in Figure 12 to § 679 is open to trawling from 1200 hours A.l.t., April 1 to 1200 hours A.l.t., June 15 of each year.[38] (Figure 19)

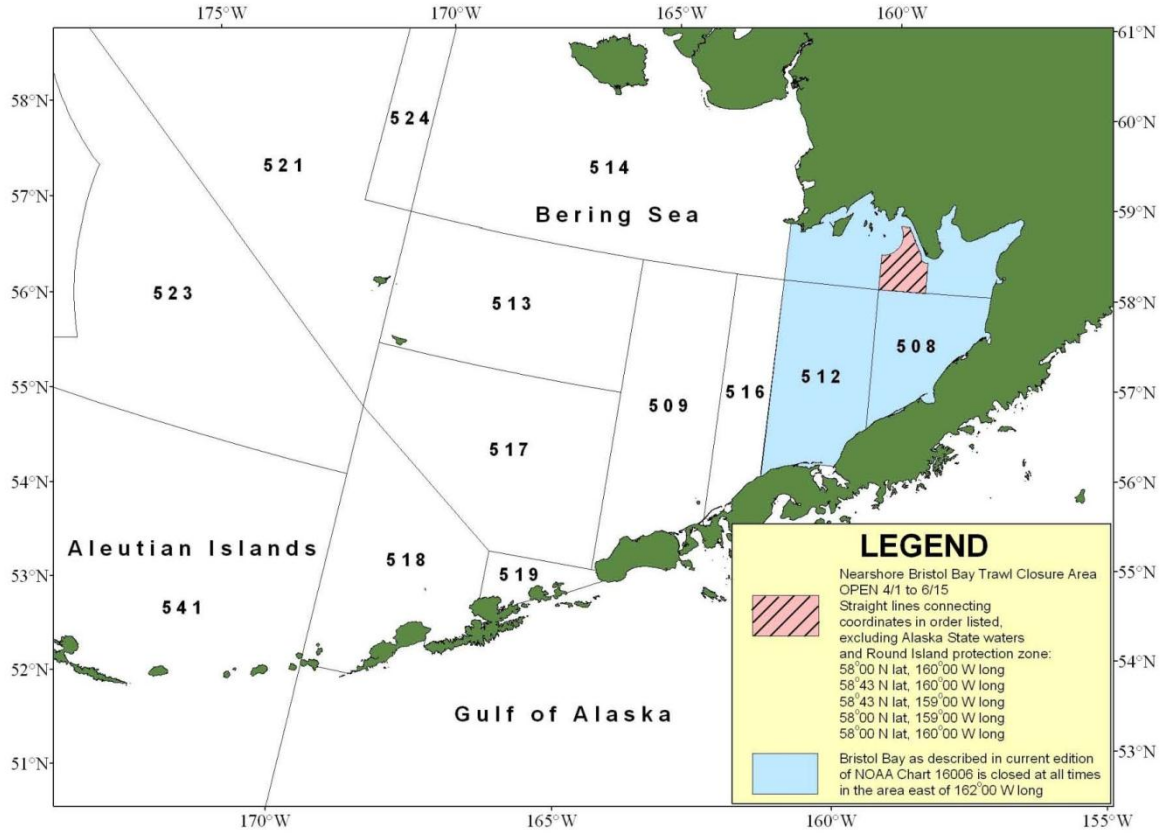


Figure 19 Nearshore Bristol Bay Trawl Closure Area

III. Gulf of Alaska

A. Steller Sea lion protection measures

Steller sea lion protection measures in the GOA are § 679.22 and mapped in Figure 20.

[38] A USFWS survey in 2000 determined that offshore sea otter groups were located primarily in the Nearshore Bristol Bay Trawl Closure Area (NBBTCA) (USFWS 2010). The NBBTCA is closed to all types of trawling except for a small portion during April 1 to June 15. Due to this limited trawling activity, the probability of interaction between sea otters and fishing vessels in this area is discountable.

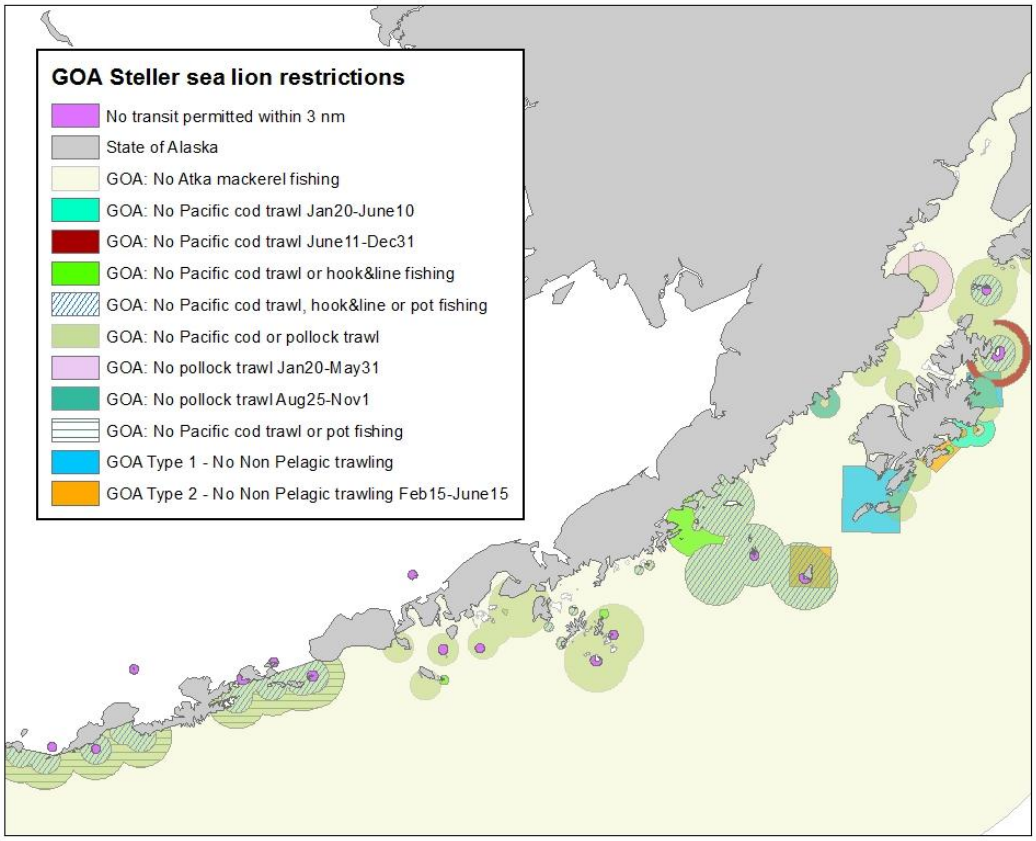


Figure 20 Gulf of Alaska Steller sea lion restrictions

B. Habitat Conservation Areas

a. GOA Slope Habitat Conservation Areas: No federally permitted vessel may fish with nonpelagic trawl gear in the Gulf of Alaska Slope Habitat Conservation Areas (Figure 21), as described in Table 27 to § 679.

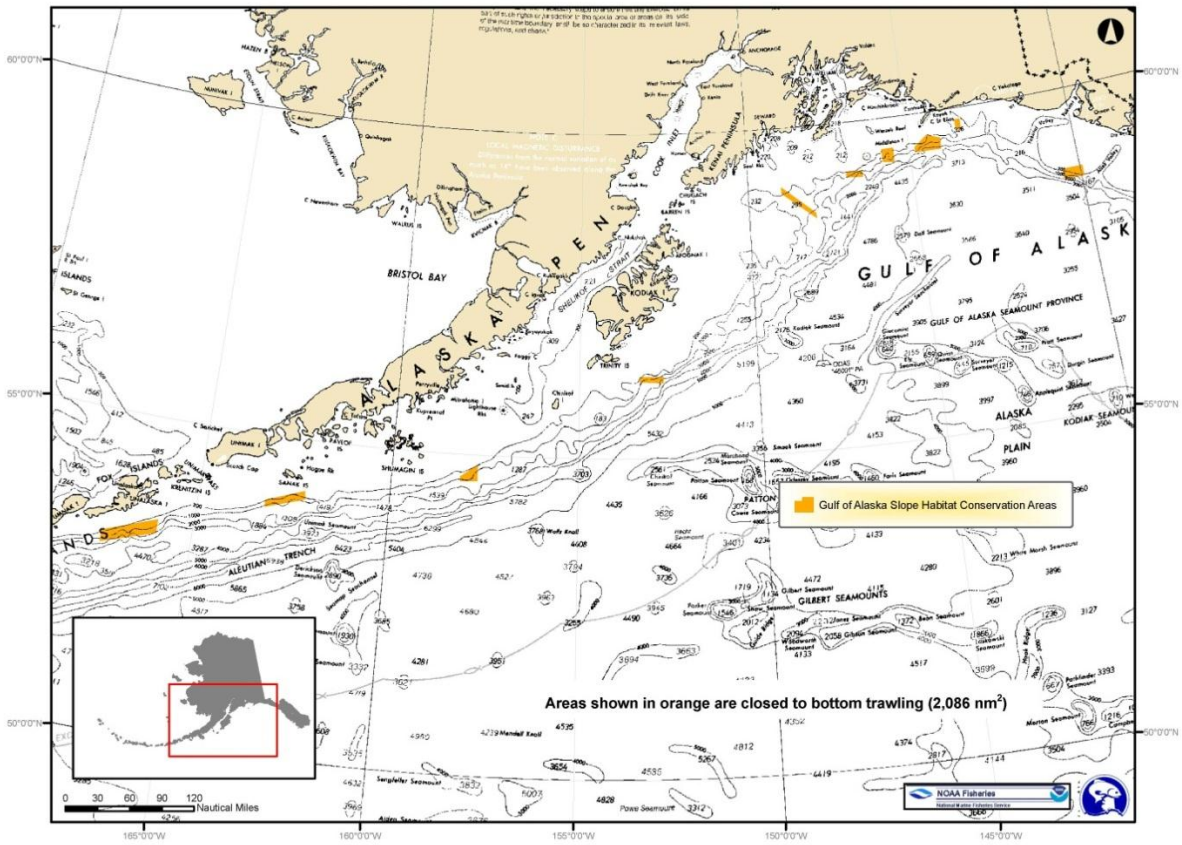


Figure 21 GOA Slope Habitat Conservation Areas

b. Alaska Seamount Habitat Protection Areas: No federally permitted vessel may fish with bottom contact gear in the Alaska Seamount Habitat Protection Areas (Figure 22), as described in Table 22 to § 679.

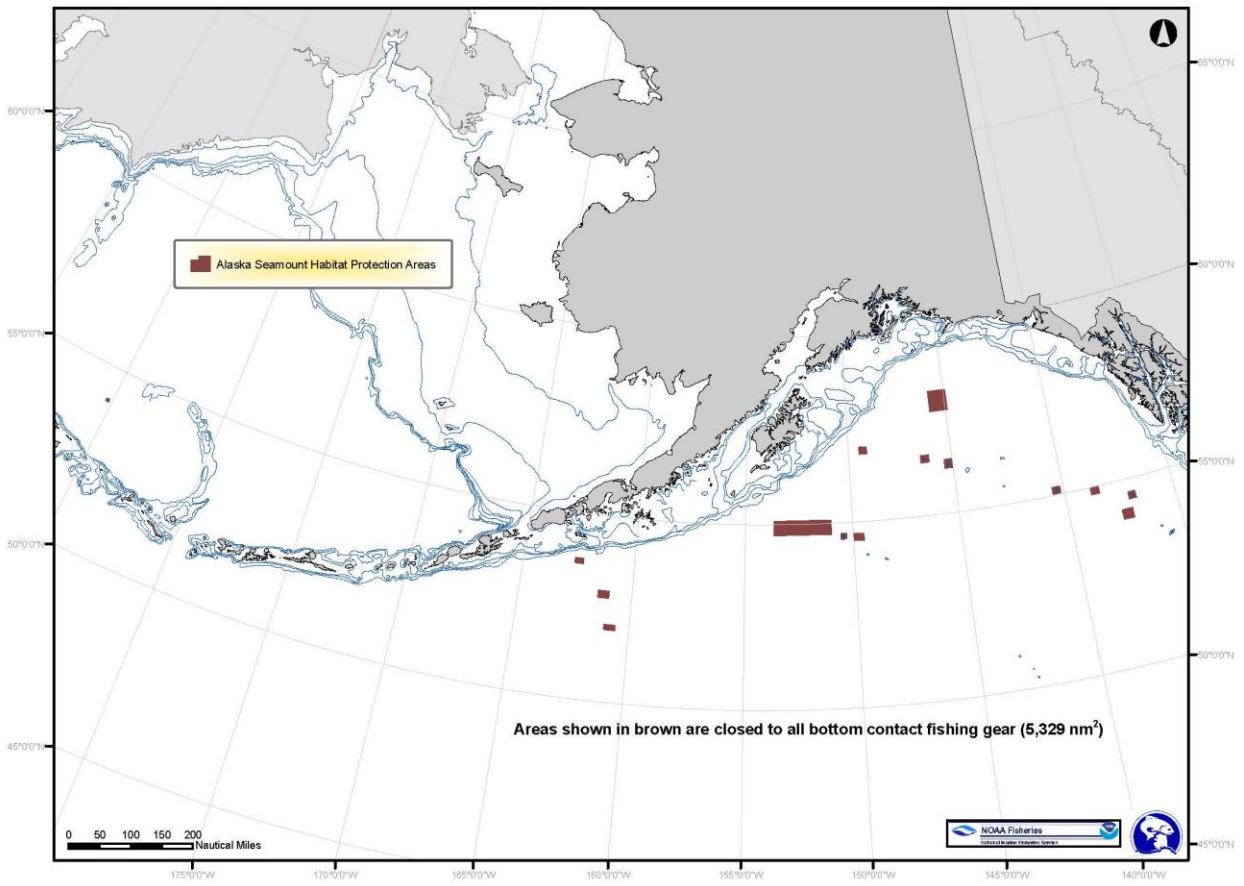


Figure 22 Alaska Seamount Habitat Protection Areas

I. Fisheries closures by federal reporting area for SWDPS of the northern sea otter

Figures 23 through 29 present SWDPS northern sea otter critical habitat in relation to Steller sea lion critical habitat and protection measures, habitat conservation areas, and other fishery closures by federal reporting area. Sea otter sightings using the Platform of Opportunity database are presented for 1990–1999 and 2000–2007.

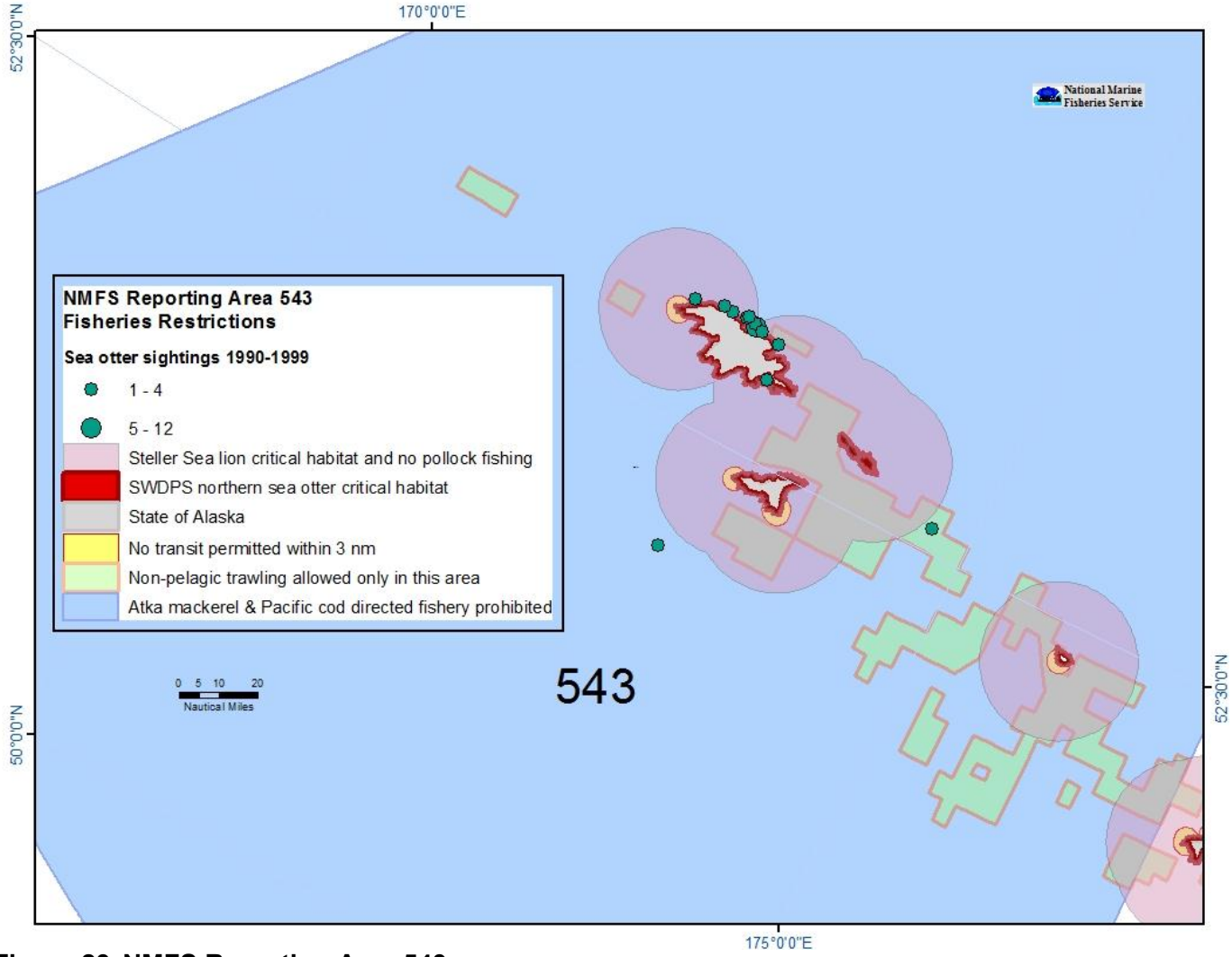


Figure 23 NMFS Reporting Area 543

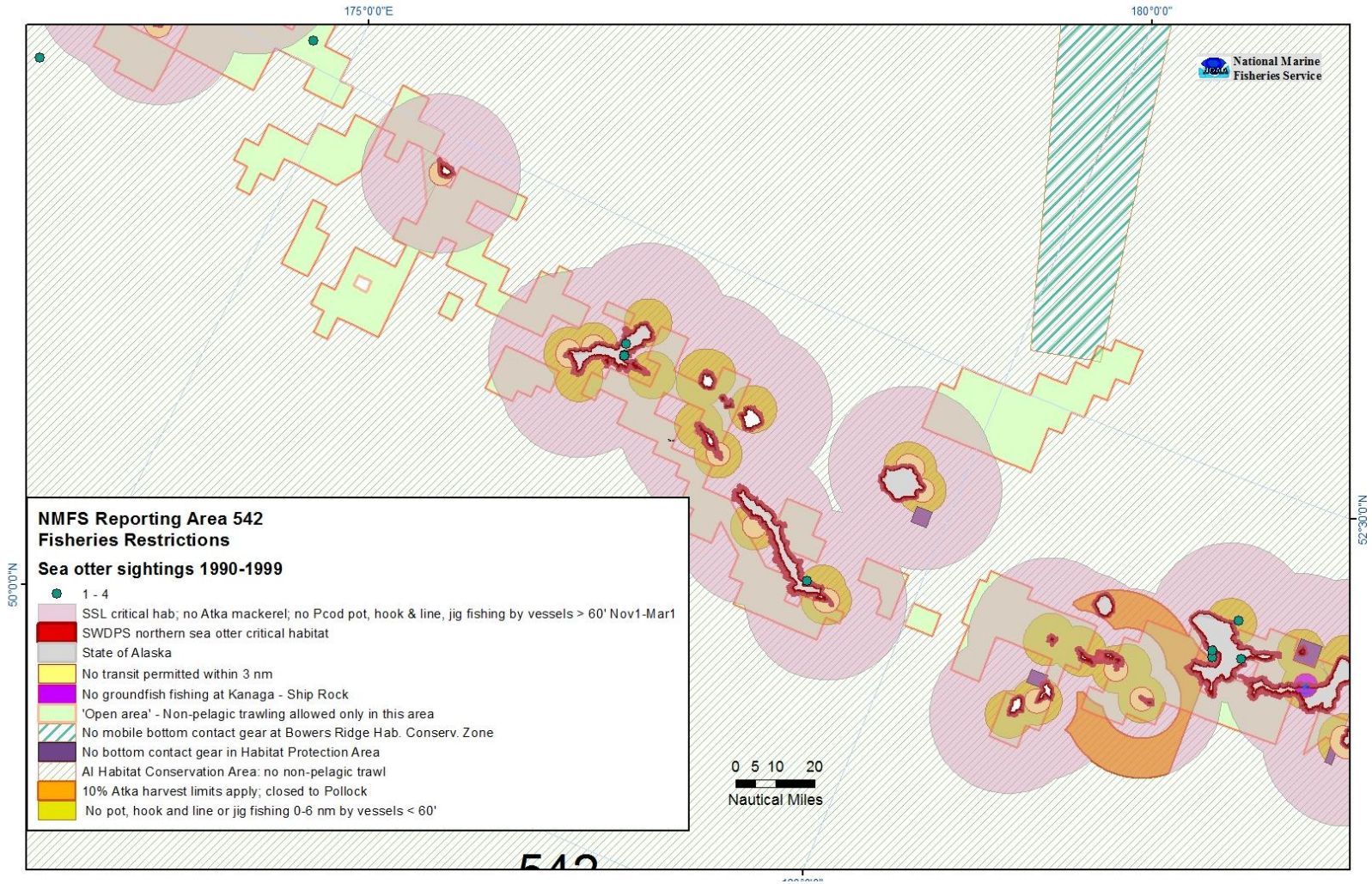


Figure 24 NMFS Reporting Area 542

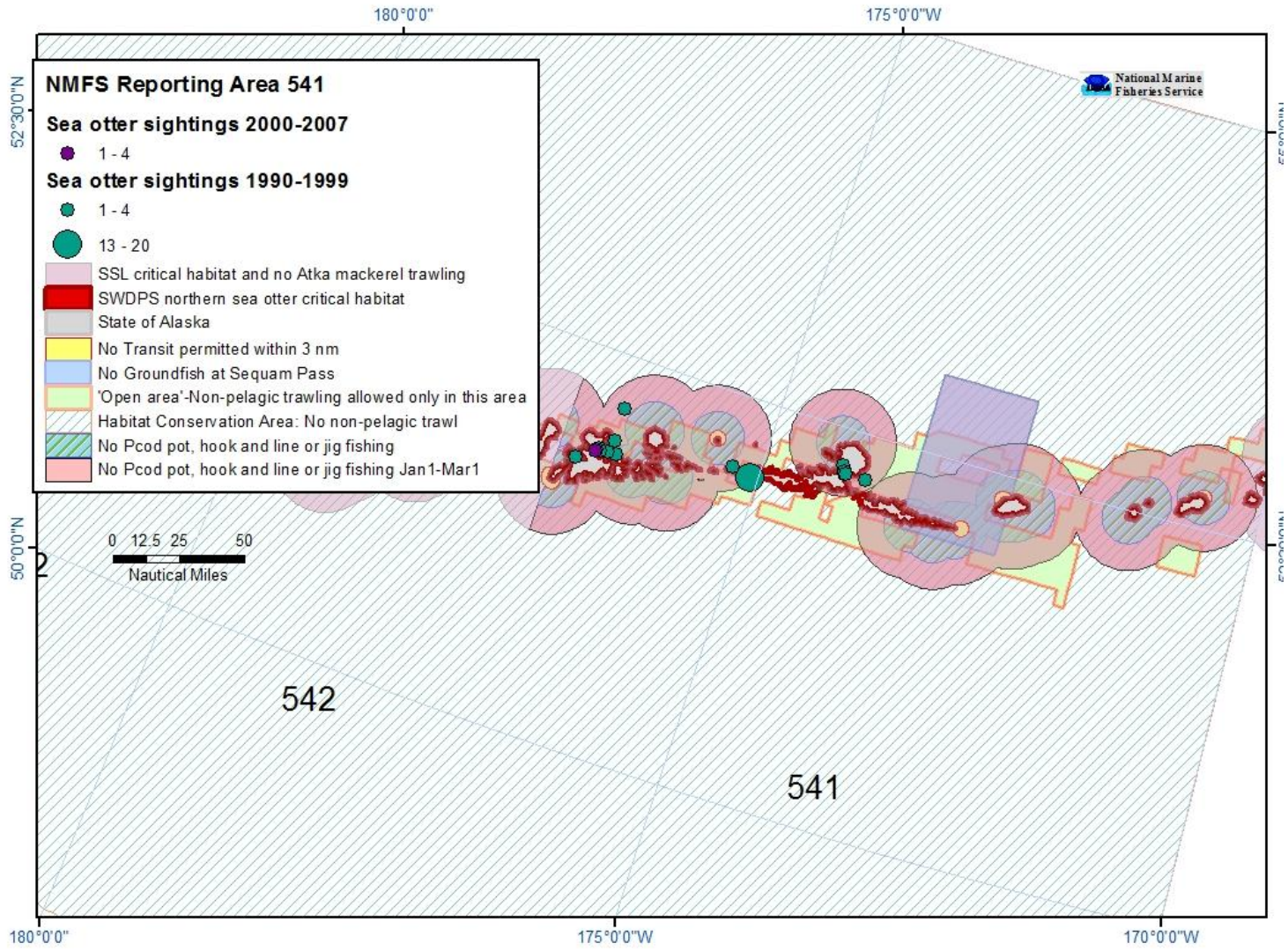


Figure 25 NMFS Reporting Area 541

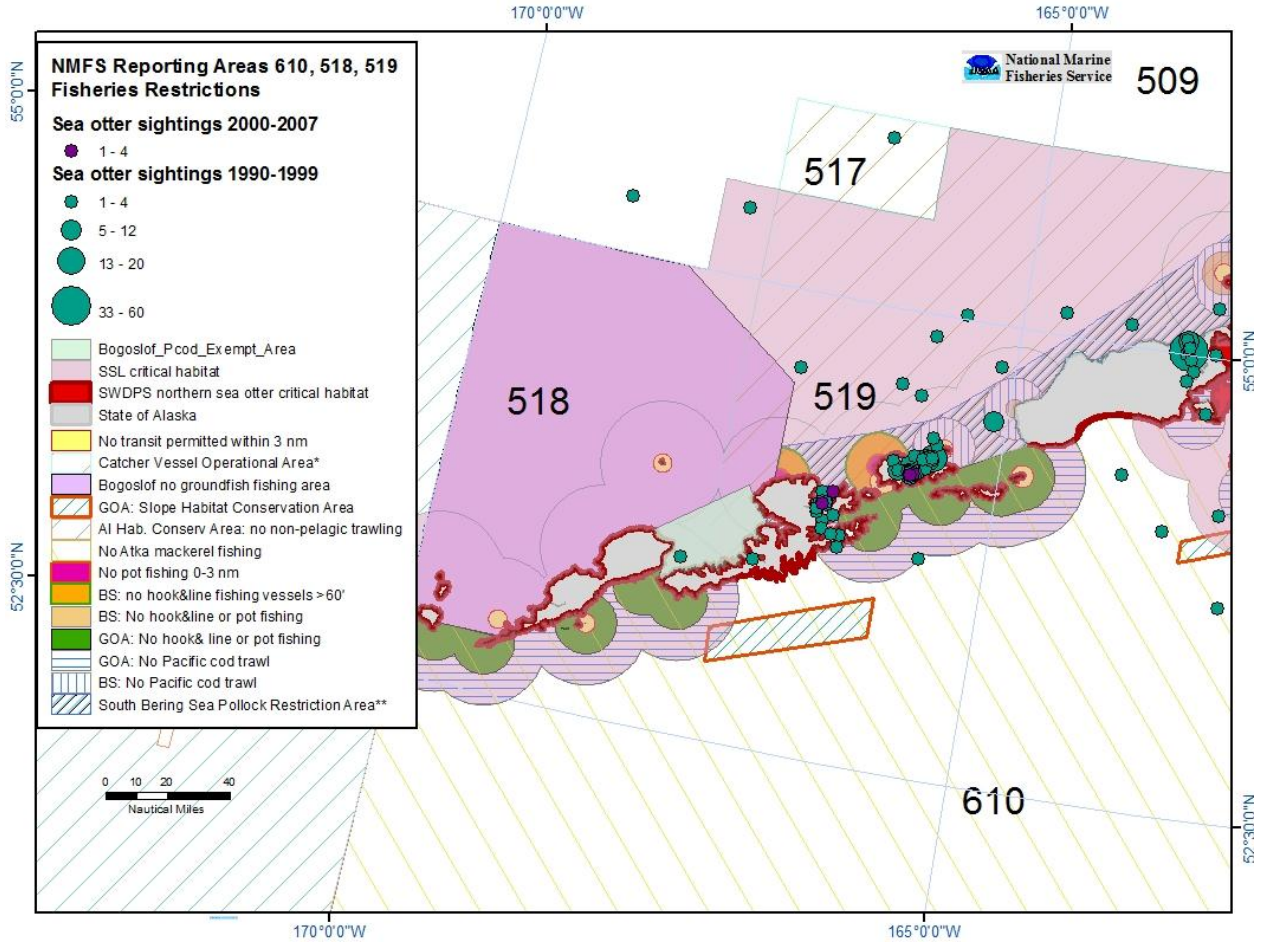


Figure 26 NMFS Reporting Area 610, 518, 519

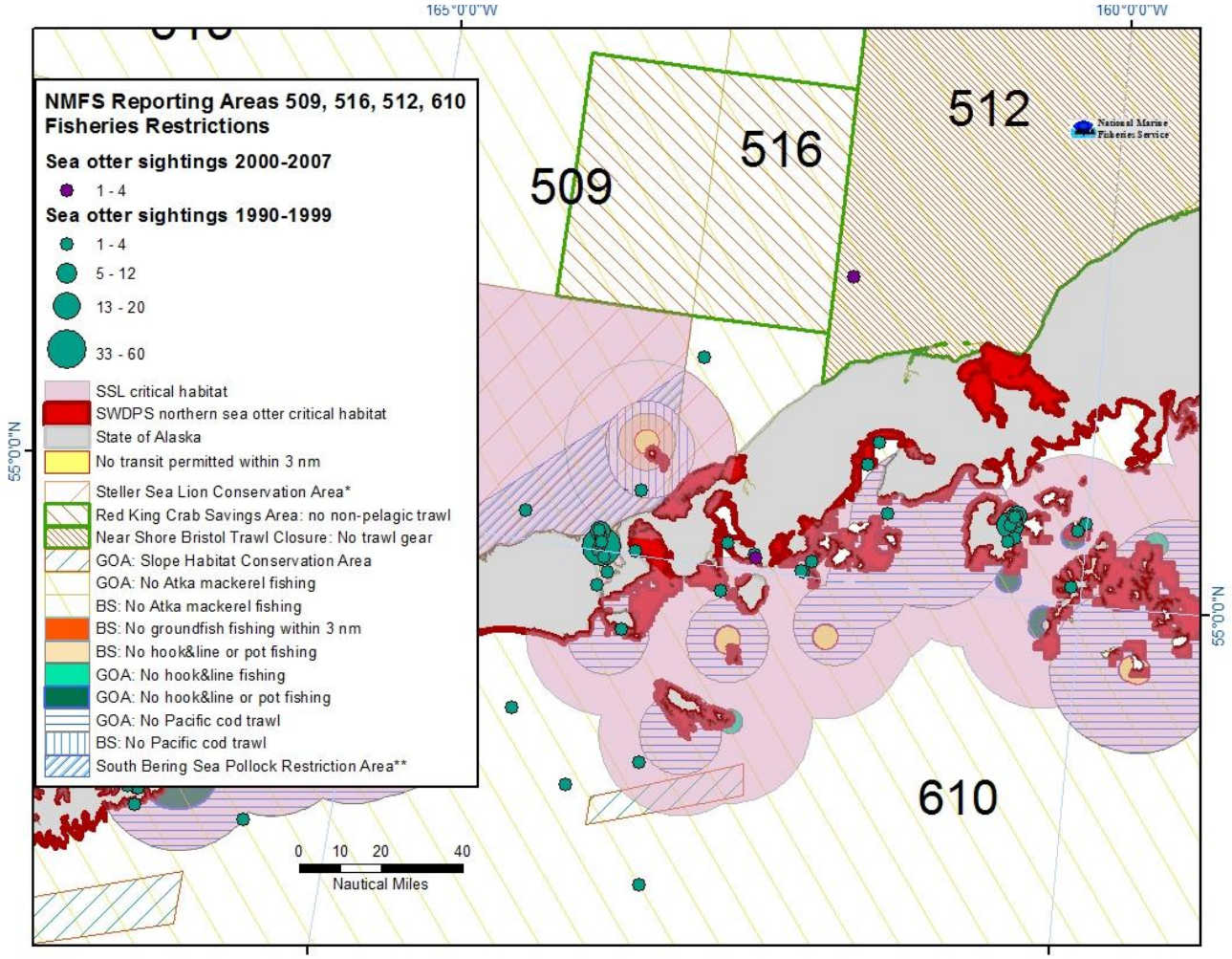


Figure 27 NMFS Reporting Areas 509, 516, 512, 610

*Except for directed fishing for Pollock under the Community Development Quota program, catcher/processor vessels are prohibited from directed fishing for Pollock during the B season.
** Closed to directed fishing for Pollock during the A season.

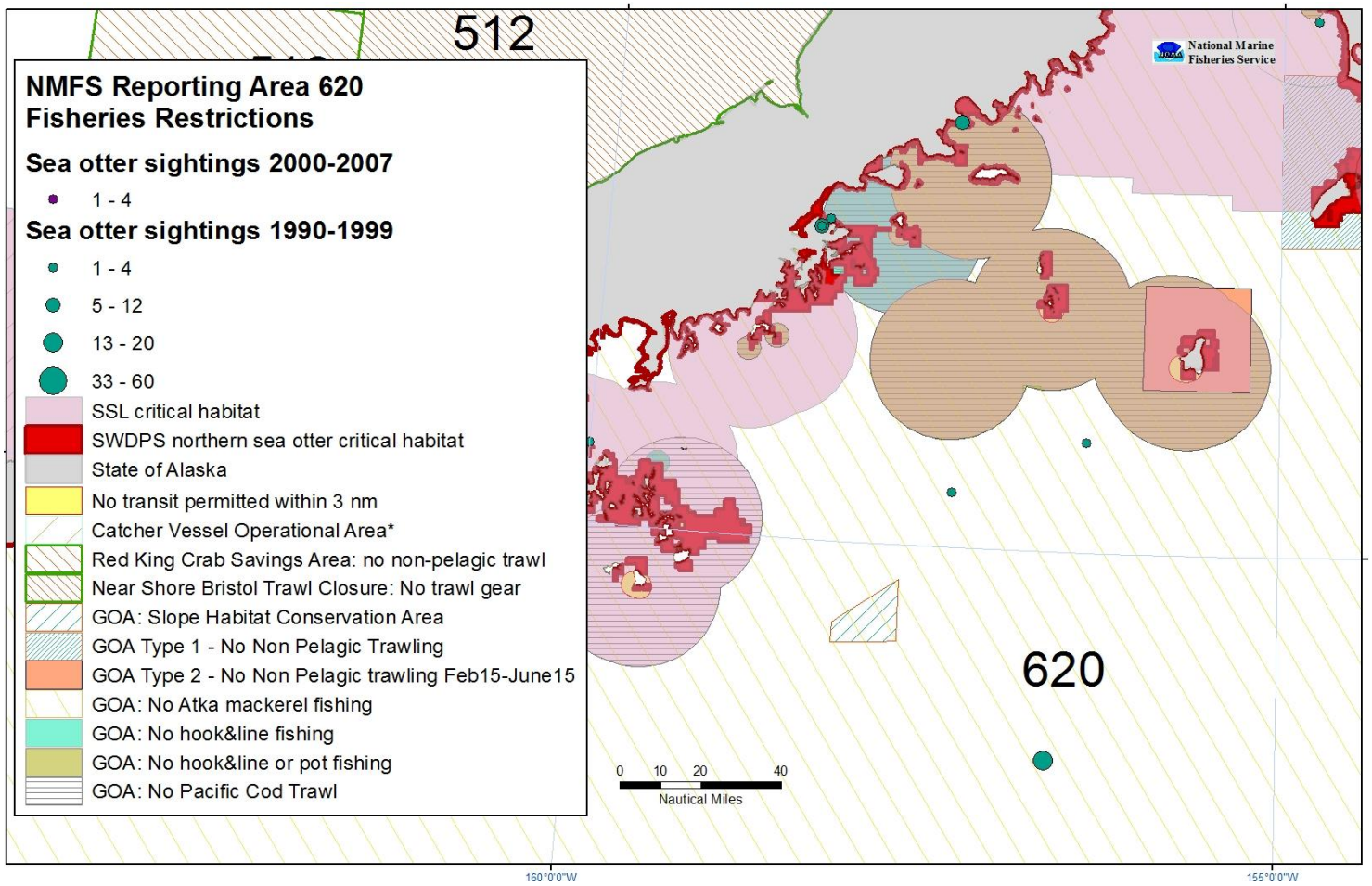


Figure 28 NMFS Reporting Area 620

*Except for directed fishing for Pollock under the Community Development Quota program, catcher/processor vessels are prohibited from directed fishing for Pollock during the B season.

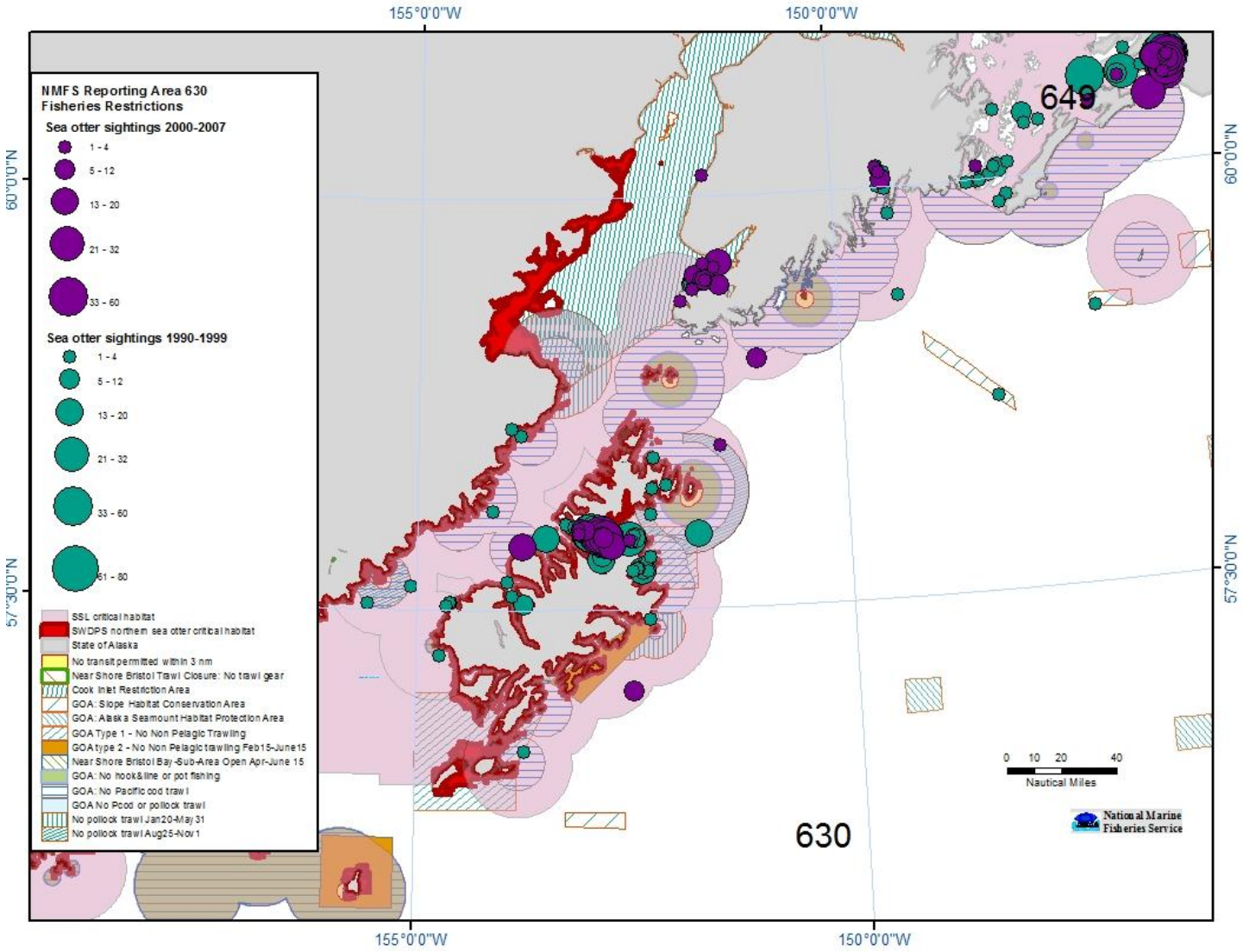


Figure 29 NMFS Reporting Area 630