Programmatic Biological Assessment on the Effects of the Pacific Halibut Fisheries in Waters off Alaska on the Endangered Short-tailed Albatross (*Phoebastria albatrus*), the Threatened Alaska-breeding Population of the Steller's Eider (*Polysticta stelleri*), and the Threatened Spectacled Eider (*Somateria fischeri*)

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1.0 Executive Summary

Under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) listed the short-tailed albatross as endangered in 1970, the spectacled eider as threatened in 1993, and the Alaska-breeding population of the Steller's eider as threatened in 1997. The Sustainable Fisheries Division of National Marine Fisheries Service, Alaska Region, is requesting consultation under section 7 of the ESA for the effects of fisheries (as defined below) on short-tailed albatross, the spectacled eider, and the Alaska-breeding population of the Steller's eider.

This biological assessment analyzes the potential direct and indirect effects of the commercial, sport, and subsistence 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 on short-tailed albatross, the spectacled eider, and the Alaska-breeding population of the Steller's eider. Cumulative effects of non-Federal actions also are examined.

Historically, short-tailed albatross have been taken incidental to the Gulf of Alaska and the Bering Sea and Aleutian Islands groundfish fisheries (USFWS 2014a). The commercial Pacific halibut fishery off Alaska has documented take of one short-tailed albatross in 1987. Therefore, the fisheries have a direct effect on short-tailed albatross. Given this historical take, we determined that the commercial Pacific halibut fishery in U.S. Convention waters off Alaska is likely to adversely affect the endangered short-tailed albatross.

The premise for reinitiating consultation is that the likelihood of observing short-tailed albatross takes in the commercial halibut fishery has increased due to the addition of observer coverage in 2013 and increasing short-tailed albatross population, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross takes. The number of commercial halibut fishing vessels has decreased since 2009. In Areas 3A and 3B, where the highest concentration of effort (by weight of halibut caught and by number of hooks deployed) is seen, the effort has decreased since 2009. There have been no takes since 1987 and no evidence to suggest there would be future takes. Because the past take was an isolated event and there have been no documented takes in recent years, the likelihood of incidental take of the short-tailed albatross is no greater now than in the past. USFWS has not designated critical habitat for this species.

While subsistence and sport halibut fishing vessels may come into contact with short-tailed albatross, there have been no recorded takes of short-tailed albatross in the subsistence or sport halibut fisheries in U.S. Convention waters off Alaska, and thus the likelihood of incidental take of short-tailed albatross is discountable.

There are no recorded takes of Steller's eider or spectacled eider in the Pacific halibut fisheries off Alaska.

Very limited halibut fishing occurs in the Steller's eider critical habitat near Cape Avinof. Therefore, direct effects from the halibut fisheries in U.S. Convention waters off Alaska are not anticipated on the Alaska-breeding population of Steller's eider or its critical habitat. No halibut fisheries occur in spectacled eider critical habitat. Therefore there are no direct effects from the halibut fisheries in U.S. Convention waters off Alaska on the spectacled eider or its critical habitat.

This analysis shows that potential indirect effects on the short-tailed albatross are due to fishing activities and possibly the impact of competition for food (e.g., squid). The probability that any of the contaminants from fishing activities would rise to the level of adversely affecting the short-tailed albatross is unlikely. The likelihood that the halibut fisheries in U.S. Convention waters off Alaska would alter the short-tailed albatross' natural foraging strategy is unlikely given that short-tailed albatross scavenge primarily on dying mesopelagic or meso-bathypelagic squid at the surface (Walker et al. 2015). Additionally, no conservation concerns exist for squid populations in the BSAI and GOA (NPFMC 2017b). These indirect effects are expected to be discountable. Thus, indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are not expected to adversely affect the short-tailed albatross.

Potential indirect effects on the spectacled eider are due to vessel strikes, large numbers of small petroleum spills, and fundamental changes in the marine ecosystem brought about by harvest or overharvest of fish and shellfish. These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the spectacled eider or its critical habitat.

Potential indirect effects on the Alaska-breeding population of the Steller's eider are due to petroleum spills, vessel strikes, or pollution from seafood processing plant effluents. These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the threatened Alaska-breeding population of the Steller's eider or its critical habitat.

We conclude that:

- The commercial Pacific halibut fishery in U.S. Convention waters off Alaska is likely to adversely affect the short-tailed albatross.
- The subsistence and sport Pacific halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the short-tailed albatross.
- The Pacific halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the spectacled eider, designated critical habitat for the spectacled eider, the Alaska-breeding population of the Steller's eider, or designated critical habitat for the Alaska-breeding population of the Steller's eider.

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3.0 Purpose and consultation history

3.1 General ESA section 7 requirements

The Endangered Species Act of 1973, 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.

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 National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (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 NMFS and USFWS to summarize consultations in biological opinions that detail how actions may adversely affect threatened or endangered species and designated critical habitat and conclude whether the action is likely to jeopardize the continued existence of the species or destroy or adversely modify designated critical habitat. The rationale for reinitiating consultation is provided in Section 3.4.

3.2 Background

NMFS coordinates with the International Pacific Halibut Commission (IPHC) on development of regulations governing the subsistence, sport, and commercial Pacific halibut (*Hippoglossus stenolepis*) fisheries off Alaska.

The Northern Pacific Halibut Act of 1982 (Halibut Act) provides the Secretary of Commerce with the authority and general responsibility to carry out the requirements of the Convention between Canada and the United States for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea (Convention), signed at Ottawa, Ontario, on March 2, 1953, as amended by a Protocol Amending the Convention (signed at Washington, D.C., on March 29, 1979) and the Halibut Act. The regional fishery management councils may develop, and the Secretary of Commerce may implement, regulations governing harvesting privileges among U.S. fishermen in U.S. waters that are in addition to, and not in conflict with, approved IPHC regulations. The North Pacific Fishery Management Council has exercised this authority most notably in developing halibut management programs for three fisheries that harvest halibut in Alaska: the subsistence, sport, and commercial fisheries.

The purpose of this biological assessment is to determine if the halibut fisheries off Alaska adversely affect ESA-listed seabirds or designated critical habitat in the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA). Three ESA-listed seabirds occur in the BSAI and GOA: the endangered short-tailed albatross (*Phoebastria albatrus*), and the threatened Steller's eider (*Polysticta stelleri*) and spectacled eider (*Somateria fischeri*). Critical habitat has been designated off Alaska for the Steller's eider and the spectacled eider.

In 1970, the short-tailed albatross was listed as endangered under the Endangered Species Conservation Act of 1969 (35 FR 8495, June 2, 1970), the predecessor of the ESA. However, due to an administrative error, the listing included the entire range of the species except the United States (50 CFR 17.11). The USFWS corrected the listing through a final rule in 2000 that listed the short-tailed albatross as endangered throughout its range (65 FR 46643, July 31, 2000). Under the ESA, a final recovery plan was completed September 2008 (USFWS 2008), a 5-year review was completed September 2009 (USFWS 2009), and a second 5-year review completed September 2014 (USFWS 2014a). Those 5-year reviews concluded with a recommendation of no change in the endangered classification for the short-tailed albatross. USFWS has not designated critical habitat for this species as there are a lack of habitat-related threats in the United States, and there are no areas that USFWS could identify as meeting the definition of critical habitat (65 FR 46643, July 31, 2000; USFWS 2008).

USFWS was petitioned in 1990 to list the Steller's eider as endangered under the ESA. USFWS concluded after reviewing the status of the species, that listing was warranted but precluded by higher listing priorities. USFWS reconsidered the status of the species in 1993, and determined that the available information did not support a species-range listing. However, it supported listing the Alaska-breeding population in the Yukon-Kuskokwim Delta, where they were historically in high numbers, but had essentially disappeared (USFWS 2002a). USFWS listed the Alaska-breeding population of the Steller's eider as threatened on June 11, 1997 (62 FR 31748). Critical habitat for the Alaska-breeding population of the Steller's eider became effective on March 5, 2001 (66 FR 8850, February 2, 2001).

USFWS was petitioned in 1990 to list the spectacled eider as endangered and to designate critical habitat. In February 1992, USFWS found the listing warranted, and the final rule designating the spectacled eider as threatened throughout its range was published May 10, 1993 (58 FR 27474). Critical habitat for spectacled eiders became effective on March 8, 2001 (66 FR 9146, February 6, 2001).

3.3 Consultation History

In 1997, NMFS initiated a section 7 consultation with USFWS on the effects of the commercial Pacific halibut fishery off Alaska on the short-tailed albatross. USFWS issued a biological opinion in 1998 that concluded that the commercial Pacific halibut fishery off Alaska was not likely to jeopardize the continued existence of the short-tailed albatross (USFWS 1998).

In 2013, NMFS initiated a section 7 consultation with USFWS on the effects of the Federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries on the southwest distinct population segment (DPS) of the northern sea otter and its designated critical habitat. The USFWS concurred with NMFS's determination that the authorization of fisheries under NMFS jurisdiction is not likely to adversely affect the southwest DPS of the northern sea otter or its critical habitat (USFWS 2013).

In 2014, NMFS initiated a section 7 consultation with USFWS on the effects of the Federal fisheries, State parallel groundfish fisheries, and Pacific halibut fisheries on the arctic subspecies of ringed seals and the Beringia DPS of bearded seals. The USFWS concurred with NMFS's determination that the authorization of fisheries under NMFS jurisdiction is not likely to adversely affect the arctic subspecies of ringed seals and the Beringia DPS of bearded seals (USFWS 2014b).

In the most recent short-tailed albatross incidental take statement for commercial halibut fishing activities in U.S Convention waters off Alaska (USFWS 1998), USFWS anticipates up to two short-tailed albatross could be reported taken bi-annually (every 2 years).

3.4 Initiation and Reinitiation of section 7 consultation

NMFS coordinates with the IPHC on development of regulations governing the subsistence, sport, and commercial Pacific halibut fisheries off Alaska. The actions analyzed in this biological assessment include the subsistence, sport, and commercial Pacific halibut fisheries off Alaska.

The endangered short-tailed albatross (*P. albatrus*), threatened Steller's eider (*P. stelleri*), and threatened spectacled eider (*Somateria fischeri*) occur in U.S. Convention waters off Alaska as does designated critical habitat for the Alaska-breeding population of Steller's eider (50 CFR 17.95(b)) and the spectacled eider (50 CFR 17.95(b)). Because the halibut fisheries off Alaska overlap the distribution of these species and their critical habitat, NMFS has determined that the best available information indicates the halibut fisheries may affect these species and their critical habitat. Therefore, this biological assessment evaluates the effects of the Alaska halibut fisheries on those species and associated designated critical habitat.

NMFS is reinitiating ESA section 7 consultation for the commercial Pacific halibut fishery off Alaska because increases in the short-tailed albatross population (see Section 6.2) in conjunction with new observer coverage in the fishery increase the likelihood of observing short-tailed albatross interactions in the commercial Pacific halibut fishery. New information is available on the interactions with short-tailed albatross from the North Pacific Observer Program (Observer Program). NMFS restructured the Observer Program in January 2013 to improve observer data quality, more equitably distribute the industry's observer coverage costs, and expand observer coverage to vessels less than 60 ft length overall and the commercial halibut sector (77 FR 70062, November 21, 2012). The Observer Program monitors fish catch and bycatch and marine mammal and seabird interactions in Alaska's federally managed, commercial groundfish and halibut fisheries. For the purposes of this biological assessment, we refer to seabird interactions as seabird bycatch. In summary, NMFS is reinitiating consultation because the increase in the short-tailed albatross population may warrant a review of the allowable incidental take (USFWS 1998) to ensure that the Pacific halibut fisheries off Alaska remain not likely to jeopardize the continued existence of short-tailed albatross.

NMFS is initiating ESA section 7 consultation for the subsistence and sport Pacific halibut fisheries off Alaska for short-tailed albatross.

NMFS is initiating ESA section 7 consultation for the Pacific halibut fisheries off Alaska for Steller's eider to examine the likelihood of the Pacific halibut fisheries off Alaska to affect the Steller's eider or its critical habitat.

NMFS is initiating ESA section 7 consultation for the Pacific halibut fisheries off Alaska for spectacled eider to examine the likelihood of the Pacific halibut fisheries off Alaska to affect the spectacled eider or its critical habitat.

4.0 Description of the action area and action

4.1 Description of the action area

This biological assessment addresses potential adverse effects from halibut fisheries in U.S. Convention waters off Alaska within IPHC Regulatory Areas 2C, 3A, 3B, 4A, 4B, 4C, 4D, and 4E.

The action area is determined based on consideration of all the direct and indirect effects on the species of the agency action. The action area also includes areas that may result in effects on the species by other activities that are interrelated or interdependent with the action, as required by 50 CFR 402.12.

All direct and indirect effects on short-tailed albatross, Steller's eider, and spectacled eider related to the activities authorized by the Pacific halibut fisheries off Alaska are believed to occur within these areas, as defined below. The following sections describe the gear types, harvest effort, management programs, fishing seasons, fisheries observer coverage, data collection, and seabird bycatch mitigation measures.

4.2 Description of the action

NMFS coordinates with the IPHC on development of regulations governing the subsistence, sport, and commercial Pacific halibut fisheries off Alaska.

The Halibut Act provides the Secretary of Commerce with the authority and general responsibility to carry out the requirements of the Convention and the Halibut Act. The regional fishery management councils may develop, and the Secretary of Commerce may implement, regulations governing harvesting privileges among U.S. fishermen in U.S. waters that are in addition to, and not in conflict with, approved IPHC regulations. The North Pacific Fishery Management Council (Council) has exercised this authority most notably in developing halibut management programs for three fisheries that harvest halibut in Alaska: the subsistence, sport, and commercial fisheries.

The subsistence, sport, and commercial fisheries are three separate fisheries for halibut that are governed by separate regulations. Subsistence and sport halibut fishery regulations for Alaska are codified at 50 CFR part 300. Commercial halibut fisheries in Alaska are subject to the Halibut and Sablefish Individual Fishing Quota (IFQ) Program and the Western Alaska Community Development Quota (CDQ) Program (50 CFR part 679) regulations, and the area-specific catch sharing plans.

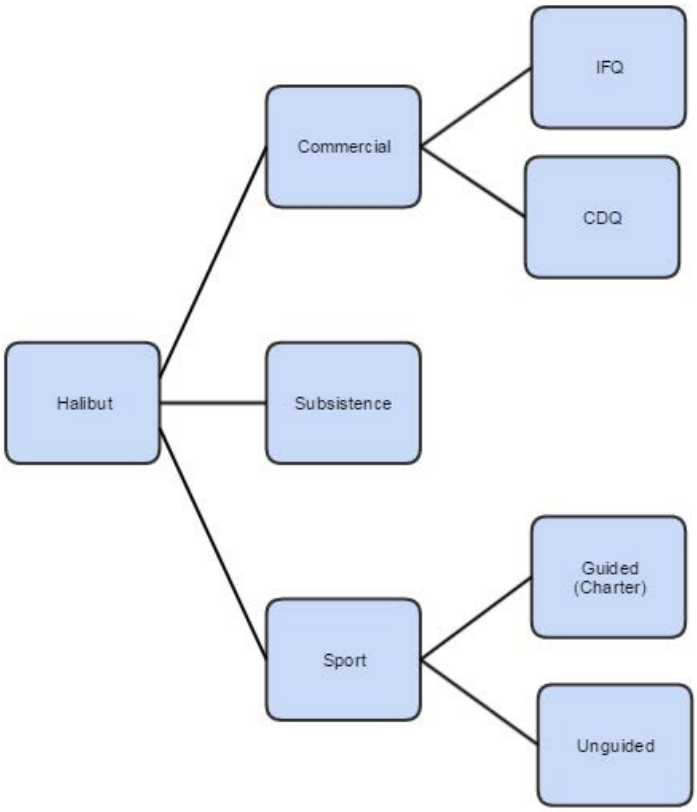

Figure 1 Halibut fisheries organization diagram.

Federal regulations generally prohibit fishing for subsistence halibut while commercial or sport fishing for halibut from the same vessel on the same calendar day, or possessing on board a vessel, halibut harvested while subsistence fishing with halibut harvested while commercial or sport fishing (50 CFR 300.66(h)). Limited exceptions exist.

The IPHC apportions catch limits for the Pacific halibut fisheries among regulatory areas: Area 2A (Oregon, Washington, and California), Area 2B (British Columbia), Area 2C (Southeast Alaska), Area 3A (Central Gulf of Alaska), Area 3B (Western Gulf of Alaska), and Area 4 (subdivided into 5 areas, 4A through 4E, in the Bering Sea and Aleutian Islands of Western Alaska).

The Alaska Department of Fish and Game (ADF&G) licenses anglers and sport fishing businesses and guides, monitors and reports on sport and subsistence harvests, and assists Federal agencies with preparation of regulatory analyses.

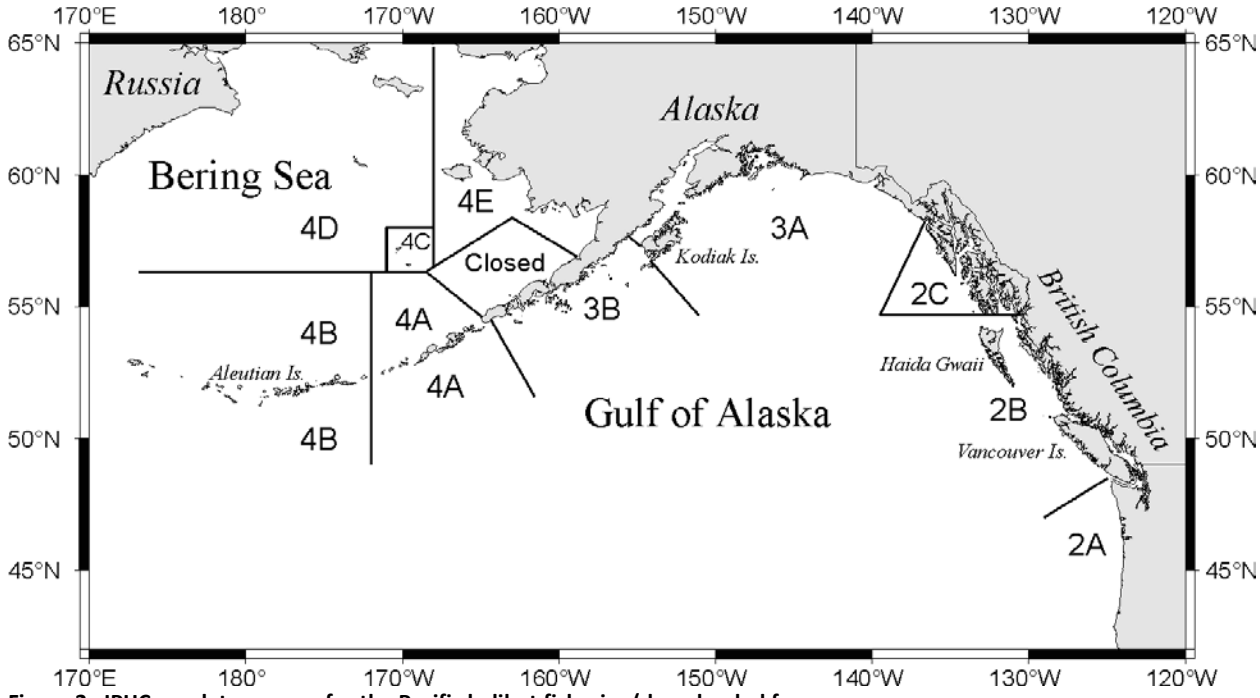

Figure 2 IPHC regulatory areas for the Pacific halibut fisheries (downloaded from http://www.iphc.int/images/iphc/RegAreasbig.gif on April 6, 2017).

IPHC regulatory area boundaries for Pacific halibut fisheries (Figure 2) are as follows (IPHC 2017):

- 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 GOA 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 GOA 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.

Some references and data are reported by NMFS reporting area (Figure 3) rather than IPHC regulatory areas (Figure 2; Figure 4). Therefore, a map and a brief description of these areas are provided here. Alaska fisheries in Federal waters are managed under fishery management plans (FMPs) authorized by the Magnuson Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and adopted by the Council. The GOA and BSAI groundfish FMPs (NPFMC 2016 and 2017a, respectively) 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 off Alaska are managed in the waters of the Exclusive Economic Zone (3 to 200 nautical miles offshore) of the United States off Alaska. Parallel groundfish fisheries in State of Alaska (State) waters are interdependent on the federally managed fisheries as they open and close concurrent with the Federal fisheries inside State waters from 0 to 3 nm off Alaska. The Bering Sea reporting area includes statistical areas 400, 508, 509, 512, 513, 514, 516, 517, 518, 519, 521, 523, 524, and 550. The Aleutian Islands reporting area includes statistical areas 541, 542, and 543. The GOA reporting area includes statistical areas 610, 620, 630, 640, and 650. More information on the Alaska groundfish fisheries can be found in the 2015 biological assessment for the GOA and BSAI groundfish fisheries (NMFS 2015a).

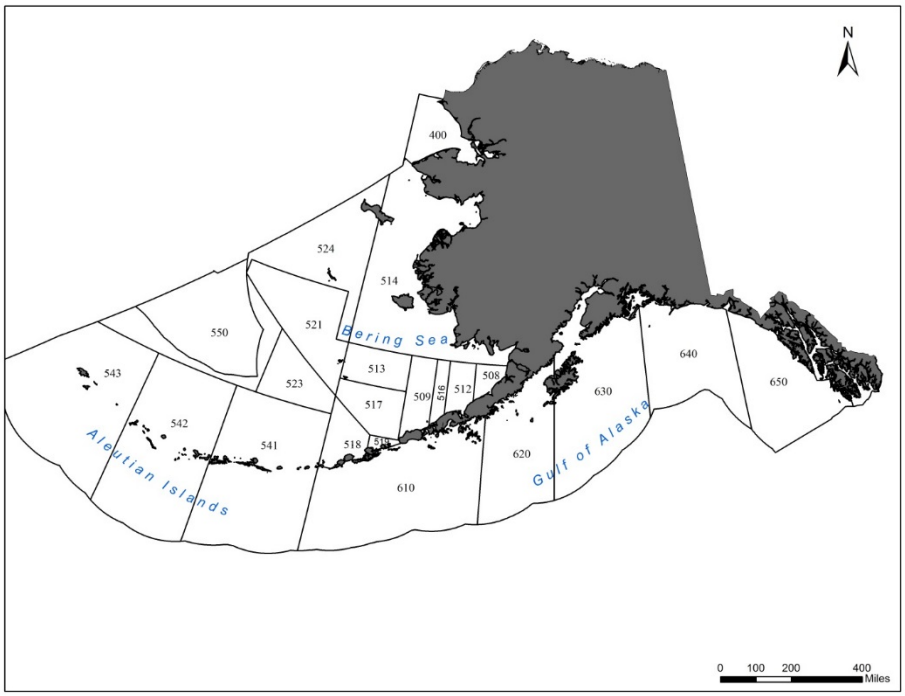

Figure 3 Bering Sea, Aleutian Islands, and GOA NMFS reporting areas.

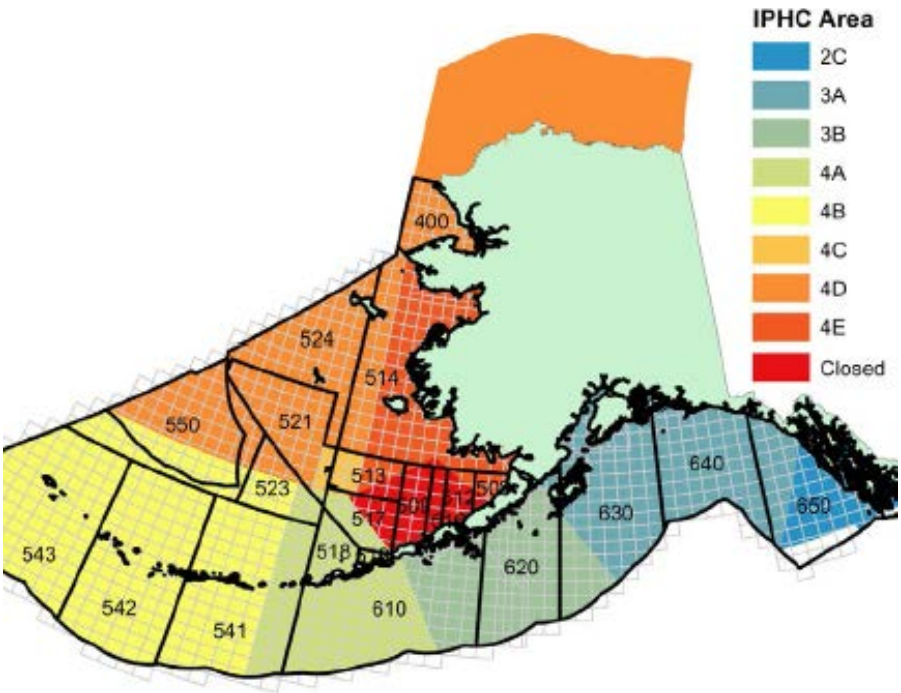

Figure 4 Overlap of NMFS reporting areas and the IPHC regulatory areas for the Pacific halibut fisheries in US. Convention waters off Alaska.

4.2.1 Commercial Halibut Fishery

Allocations of halibut to the commercial fishery off Alaska are made through the IFQ Program and the CDQ Program. The commercial halibut fishery off Alaska is governed by 50 CFR part 300 and are subject to area-specific catch sharing plans. The IFQ and CDQ programs were designed to allocate specific harvesting privileges among U.S. fishermen to resolve conservation and management problems that stem from ‘‘open access’’ management and to promote the development of the seafood industry in western Alaska. Both programs were initially implemented by rules published in the *Federal Register* on November 9, 1993 (58 FR 59375). Fishing for halibut under the IFQ and CDQ programs began on March 15, 1995. Annual management measures for the halibut fisheries off Alaska are published annually in the *Federal Register*.

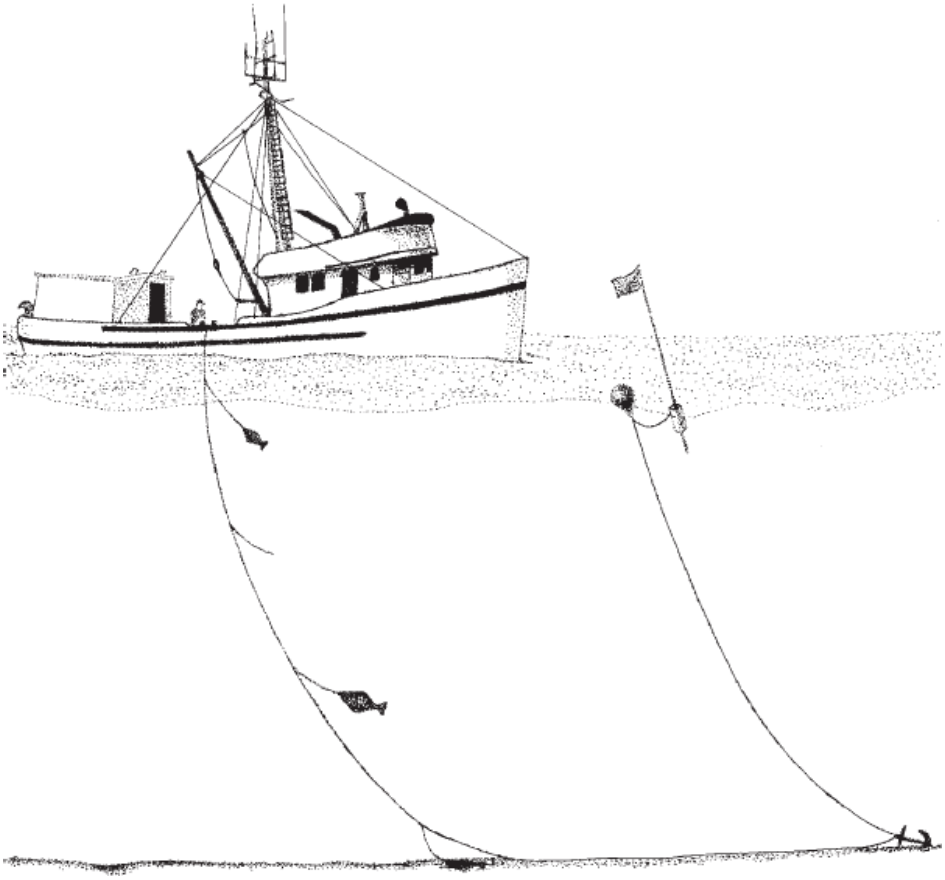

Figure 5 Commercial halibut fishing. (Image taken from IPHC 2014)

4.2.1.1 Halibut Individual Fishing Quota (IFQ) Fishery

Pacific halibut is a demersal species, living on or near the seabed. Halibut are typically harvested in waters from 300 to 2,000 feet deep. In the directed commercial halibut fishery, halibut has been prosecuted with longline gear. Longline gear includes hook-and-line, handline, jig, and troll gear. Participants in the halibut fisheries have generally used longline hook-and-line gear because it is more efficient than jig, troll, or handline gear. Halibut is also caught as bycatch in other longline fisheries (e.g., Pacific cod) and in the trawl fisheries. The accessibility of halibut, which in many parts of Alaska can be harvested off of small boats with limited gear, contributes to it being a target species for a variety of user groups and vessel sizes.

In 1991, the Council recommended an IFQ program for the management of the fixed gear (hook-and-line) halibut and sablefish fisheries off Alaska (NPFMC and NMFS 2016). In addition, in this same action, the Council recommended allocations of halibut and fixed gear sablefish to the CDQ Program. The Secretary of Commerce approved the Council's IFQ Program and CDQ allocations as a regulatory amendment on November 9, 1993 (58 FR 59375), and the program was implemented by NMFS for the 1995 fishing season. The IFQ Program was implemented in response to growing concerns about issues that had emerged from management of the fixed-gear halibut and sablefish fisheries under the open access regime. In both fisheries, growth in fishing capacity under open access had necessitated large

reductions in length of the fishing seasons and caused a host of undesirable biological, economic, and social effects (NPFMC and NMFS 2016).

The fundamental component of the IFQ Program is quota share (QS), issued to participants as a percentage of the QS pool for a species-specific IFQ regulatory area, which is translated into annual IFQ allocations in the form of fishable pounds. A total of 4,831 fishermen received halibut and sablefish QS initially (Information taken from IPHC 2014). NMFS issues IFQ permits annually at no cost to all persons holding QS. IFQ permits authorize participation in commercial fixed-gear harvest of Pacific halibut off Alaska. IFQ permits are not vessel-specific and are distributed to holders of fishable Pacific halibut and sablefish 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). The provisions of the IFQ Program reflect the differences between the user groups. For example, the IFQ Program includes an additional vessel class designation for halibut QS and authorizes halibut IFQ transfers from the commercial to the charter sector.

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 a privilege that entitles the shareholder to a share of the area-wide and vessel-specific IFQ allocated. The level of IFQ fluctuates with the catch limits set by the IPHC each year. QS is transferable to other initial issuees or to those who have become eligible to receive transfers on NMFS's 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.

Halibut IFQ is harvested both by catcher vessels and catcher/processors using fixed gear. QS is divided into categories based on the length of the vessel, see Table 1 below. The halibut vessel size categories were designed to maintain a diverse, owner-operated fleet and provide an entry-level opportunity in the IFQ fisheries. According to regulations, QS holders must be on board to fish their IFQ unless they are initial recipients of quota. Initial recipients of quota are allowed to hire a skipper to fish their IFQ. This privilege is not permitted for those who did not receive an initial allocation of QS purchased quota (i.e., the second generation).

Table 1 Current QS/IFQ vessel categories. Source: NPFMC and NMFS 2016.

Halibut QS/IFQ Vessel Categories	
Class A	Any length
Class B	Any length
Class C	≤ 60 feet
Class D	≤ 35 feet (except in halibut Areas 3B, 4B, and 4C where Class D IFQ may be harvested on a vessel ≤ 60 feet)

Table 2 shows that the majority of halibut QS was allocated to Class C vessels, followed by Class B. Eighty-nine percent of all QS is either Class B or Class C shares. The QS vessel categories were based on catch history in the fleet and the characteristics of the fleet change based on area and historic makeup

of the fleet. Smaller vessels that participated historically nearshore in the commercial halibut fishery make up the smaller vessel class sizes in Southeast Alaska and some communities in the GOA.

Table 2 Halibut QS distribution by vessel category in 2015. Source: NPFMC and NMFS 2016.

QS Distribution by Vessel Category in 2015		
Class A	Catcher/processor	3 percent
Class B	≤ 60 feet	37 percent
Class C	< 35 to ≤ 60 feet	52 percent
Class D	≤ 35 feet	8 percent

In the commercial halibut fishery, there are 27 different area/vessel category combinations of QS. Throughout the halibut IFQ areas, QS category distributions have remained largely the same since initial allocation, with changes not exceeding 1 percent for any vessel category-area combination. As QS vessel categories were issued based on the characteristics of historical participation, this distribution highlights the differences in fleet characteristics by area. For example, in areas where nearshore fishing opportunities are available, the fisheries tended to comprise of smaller vessels, yielding history for D or C class QS. This is the case in areas such as Southeast Alaska (Area 2C), and for some communities in the GOA (Areas 3A). Therefore, for example, in the 2C halibut fishery, C and D class QS make up almost 93 percent of the available QS, while B shares represent less than 5 percent. Area 4B and Area 4D fisheries have historically been prosecuted by larger vessels, generally more equipped to travel offshore for multiple days, and especially pre-IFQ Program, some of these vessels consisted of freezer longline operations. Because of this, in Area 4B more than 80 percent of the QS in these areas is made up of A and B class QS. In Area 4D, 91 percent of the QS is made up of A and B class shares, along with no vessels qualifying for halibut D class QS. More detail on the operation of the commercial Pacific halibut fishery off Alaska is provided in the Twenty-Year Review of the Pacific Halibut and Sablefish IFQ Management Program, on the NMFS web site (IFQ Program Review) and in IPHC Technical Report No. 59 (IPHC 2014).

4.2.1.2 Community Development Quota (CDQ)

The CDQ Program is an economic development program associated with federally managed fisheries in the BSAI. NMFS, the State of Alaska, and the Western Alaska Community Development Association administer the CDQ Program. Its purpose, as specified in the Magnuson-Stevens Act (section 305(i)(1)(A)), is to provide western Alaska communities the opportunity to participate and invest in BSAI fisheries, to support economic development in western Alaska, to alleviate poverty and provide economic and social benefits for residents of western Alaska, and to achieve sustainable and diversified local economies in western Alaska. In fitting with these goals, NMFS allocates a portion of the annual catch limits for a variety of commercially valuable marine species in the BSAI to the CDQ Program. The percentage of each annual BSAI catch limit allocated to the CDQ Program varies by both species and management area. These apportionments are, in turn, allocated among six different non-profit managing organizations representing different affiliations of communities (CDQ groups), as dictated under the Magnuson-Stevens Act. Eligibility requirements for a community to participate in the CDQ Program are identified in the Magnuson-Stevens Act at section 305(i)(1)(D).

The six CDQ groups are—

- Aleutian Pribilof Island Community Development Association (APICDA)
- Bristol Bay Economic Development Corporation (BBEDC)
- Central Bering Sea Fisherman's Association (CBSFA)
- Coastal Villages Region Fund (CVRF)
- Norton Sound Economic Development Corporation (NSEDC)
- Yukon Delta Fisheries Development Association (YDFDA)

Figure 6 identifies the names and relative locations of the CDQ groups and the communities they represent.

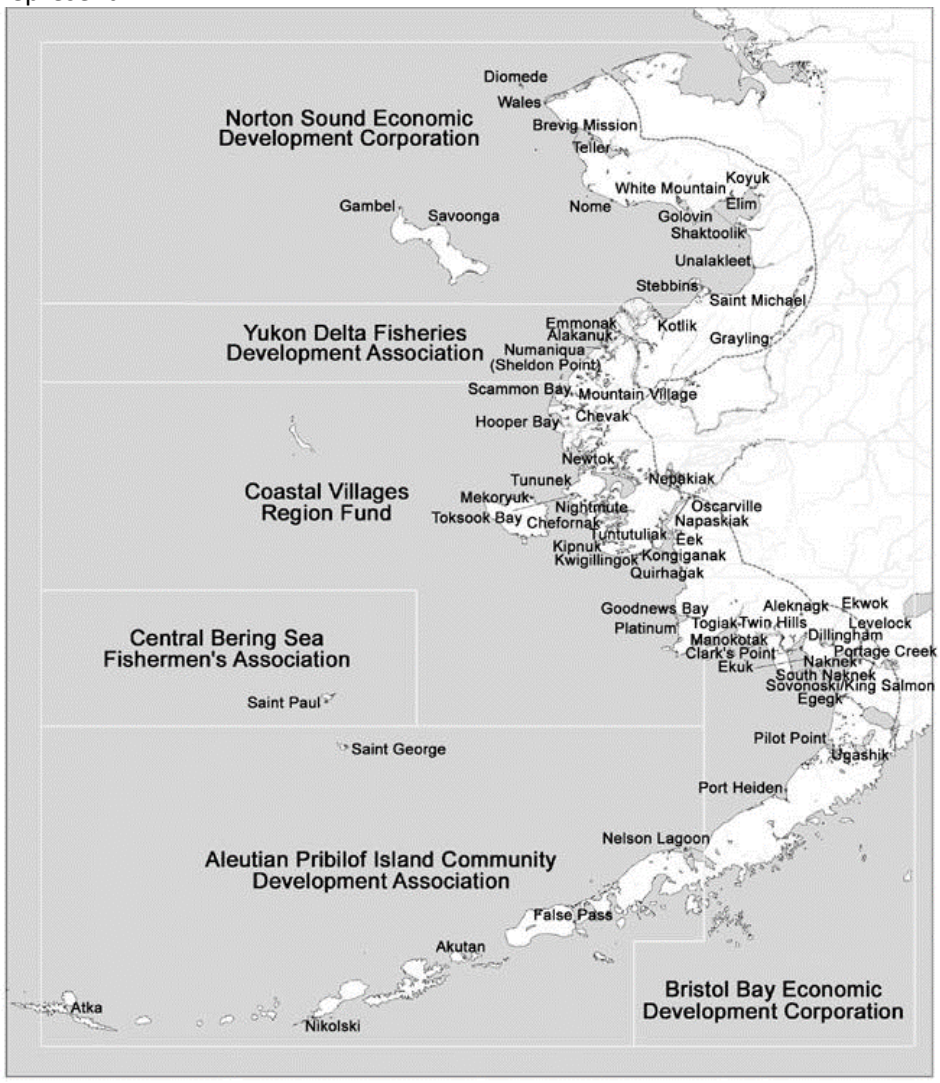

Figure 6 Names and relative locations of the CDQ groups and the communities they represent[1].

[1] This is Figure 3 from "C3 Halibut IFQ Leasing by CDQ Initial Review 0217"downloaded June 28, 2017: http://legistar2.granicus.com/npfmc/meetings/2017/1/951_A_North_Pacific_Council_17-01-30_Meeting_Agenda.pdf

4.2.1.2.1 CDQ Allocations

Among the species allocated to CDQ groups for commercial fishing, Pacific halibut is an important species for resident employment and income in many of the groups. In practice, the IPHC establishes catch limits for directed halibut fisheries and other halibut conservation measures, and the Council recommends regulations to govern the fisheries, including limited access and allocation decisions. Halibut is allocated to CDQ groups for the commercial fishery in four IPHC regulatory areas: 4B, 4C, 4D, and 4E.

Allocations of halibut quota are expected to provide CDQ groups opportunities for small vessel fishing for their fleets, and, as such, area allocations of halibut CDQ are generally correlated with the location of the groups. For instance, Area 4B is located in the Aleutian Islands where the full CDQ allocation (30 percent of total allowable catch [TAC]) is held by APICDA. Area 4C surrounds the Pribilof Islands and the CDQ portion of the TAC is split 85 percent to St. Paul Island's CBSFA and 15 percent to APICDA, which includes St. George Island as a member. The large Bering Sea halibut area of 4D halibut CDQ is split 20 percent to YDFDA, 30 percent to NSEDC, 24 percent to CVRF, and 26 percent to BBEDC. Of the final Area 4E halibut CDQ, 70 percent is allocated to CVRF and 30 percent to BBEDC.

Current regulations authorize a CDQ group to transfer halibut CDQ to another CDQ group that has a halibut CDQ allocation in the same regulatory area.

4.2.1.2.2 *The Halibut CDQ Fleet*

The characteristics of the resident halibut CDQ fleets vary by group and are impacted by factors such as the number of interested and qualified residents, the location of the halibut resource relative to nearshore fishing grounds, other fishing opportunities (such as salmon and crab fishing), other employment opportunities, and the availability of processing operations. Also, as some parts of the CDQ small vessel fishing operations have been subsidized by groups in the past, the resident fleet is also impacted by internal economic decisions made by the CDQ groups and in the ways they chose to promote economic development in their communities.

Criteria for participation in CDQ fisheries also vary by group. Some groups have a formalized process in which interested participants must submit an application demonstrating length of residency in one of the communities represented by the CDQ group. Some groups require that the vessel harvesting CDQ is 100 percent owned by a resident of a CDQ community. Other groups have a traditional set of local participants and therefore a more informal process to harvesting their groups' privileges. Many of the groups will make CDQ freely available to their eligible residents, but charge a lease rate in a situation where the CDQ is prosecuted by non-resident vessels. The intention is, in the latter case, that revenues collected from leasing CDQ can be used for other types of economic development opportunities in the communities they represent.

On average about 70 percent of the weight of landed CDQ halibut was harvested on vessels less than or equal to 51 feet length overall (LOA), between 2009 and 2015. Additionally, a great proportion of the fleet has typically been small vessels. During this same period, 96 percent of the fleet landing CDQ halibut was made up of vessels less than or equal to 51 feet LOA, and 90 percent of the vessels were less than or equal to 32 feet LOA. This indicates a large involvement of small vessels, with several larger vessels that contribute large landings.

4.2.1.3 Catch Sharing Plans

The Council implemented a catch sharing plan (CSP) among commercial IFQ and CDQ halibut fisheries in IPHC Regulatory Area 4 (Western Alaska) through rulemaking, and the Secretary of Commerce approved the plan on March 20, 1996 (61 FR 11337). The purpose of the original CSP was to establish subareas within Area 4 (Areas 4A, 4B, 4C, 4D, and 4E), and to provide for the apportionment of the Area 4 catch limit among the subareas as necessary to achieve the socioeconomic objectives of the IFQ and CDQ programs that allocate halibut among U.S. fishermen. The Area 4 CSP regulations were codified at 50 CFR 300.65, and were amended to remove Areas 4A and 4B from the CSP, so that catch limits for those areas and a combined Area 4C through 4E could be set according to the IPHC's methodology (63 FR 13000, March 17, 1998). As of 2017, Areas 4C, 4D, and 4E are still considered one area for allocation and catch limits are set according to the IPHC's methodology (82 FR 12730, March 7, 2017). New annual regulations pertaining to the Area 4 CSP also may be implemented through IPHC action, subject to acceptance by the Secretary of State.

4.2.1.4 Harvest Flexibility (CDQ/ IFQ)

There is some fishing flexibility within the halibut regulatory areas. The IPHC considers the halibut in Areas 4C, 4D, and 4E to be a single stock unit for stock assessment and management purposes. Separation of these areas from the other areas was a socio-economic decision established in the Council's catch sharing plan for Area 4 (61 FR 11337, March 20, 1996), which gave the Council latitude to consider exemptions to harvesting halibut allocations across these management areas.

Effective April 2, 2003, NMFS amended the IFQ Program to allow CDQ Program participants to harvest allocations of Area 4D CDQ halibut in Area 4E (68 FR 9902, March 3, 2003). This action was intended to allow residents in CDQ communities along the Western Alaska coast to have more near-shore opportunities to harvest their group's CDQ halibut. The IPHC regulations dictate the total amount of permissible halibut harvest for Area 4E is the sum of the 4E and 4D CDQ TAC.

Effective July 22, 2005, in response to reports of localized depletion, decreasing catch per unit effort, and resultant limitations on the optimal use of Area 4C IFQ and CDQ, the Council passed an omnibus amendment package providing for the harvest of Area 4C IFQ and CDQ in Area 4D (70 FR 43328, July 27, 2005). The total amount of permissible halibut harvest for Area 4D is the sum of Area 4D TAC and Area 4C TAC.

4.2.1.5 Observer Coverage

The same observer coverage requirements apply to vessels halibut IFQ fishing and vessels halibut CDQ fishing. More information on the North Pacific Observer Program is discussed in Section 4.2.6.

4.2.1.6 Commercial Seasons

The IPHC establishes halibut season dates under authority of the Halibut Act. NMFS, through the Alaska Regional Administrator establishes IFQ sablefish season dates by publishing a notice annually, in the *Federal Register*. Sablefish seasons have been set simultaneous with those for halibut to reduce waste and discards.

For 2017, the opening date for the tribal commercial fishery in Area 2A and the commercial halibut fishery in Areas 2B through 4E is March 11; the closing date is November 7.

Table 3 Season dates for fishing under the Individual Fishing Quota (IFQ) Program for Pacific halibut and sablefish and for the Community Development Quota (CDQ) Program for Pacific halibut[1]

Fishing Year	Season Begin Date [1]	Season End Date [2]
1995	March 15	November 15
1996	March 15	November 15
1997	March 15	November 15
1998	March 15	November 15
1999	March 15	November 15
2000	March 15	November 15
2001	March 15	November 15
2002	March 18	November 18
2003	March 1	November 15
2004	February 29	November 15
2005	February 27	November 15
2006	March 5	November 15
2007	March 10	November 15
2008	March 8	November 15
2009	March 21	November 15
2010	March 6	November 15
2011	March 12	November 18
2012	March 17	November 7
2013	March 23	November 7
2014	March 8	November 7
2015	March 14	November 7
2016	March 19	November 7
2017	March 11	November 7

[1] "Fishing Year" is a calendar year. Fishing under the IFQ program and the CDQ Program started in 1995.
[2] After the season closing date, IFQ and CDQ halibut may not be retained, and IFQ sablefish is closed for directed fishing. However, a person fishing under IFQ permits with unused IFQ sablefish must retain sablefish, up to the maximum amount allowable in the area and using the gear type under which the person is fishing.

In the Area 2A non-treaty directed commercial fishery the IPHC recommended seven 10-hour fishing periods. Each fishing period begins at 0800 hours and terminates at 1800 hours local time on June 28, July 12, July 26, August 9, August 23, September 6, and September 20, 2017, unless the IPHC specifies otherwise. These openings will occur until the quota is taken and the fishery is closed.

4.2.2 Sport

Sport Pacific halibut fishing is allowed in IPHC Regulatory Areas 2C, 3A, 3B, and 4. In IPHC Regulatory Areas 3B and 4, all sport Pacific halibut anglers are allowed a daily bag limit of 2 fish and there are no size restrictions.

Sport fishing activities for Pacific halibut primarily occur in Areas 2C and 3A where they are subject to different regulations, depending on whether those activities are guided or unguided. Guided sport fishing for halibut is subject to charter restrictions under Federal regulations that can be more restrictive than the regulations for unguided anglers. Charter regulations apply if a charter vessel guide is providing assistance, for compensation, to a person who is sport fishing, to take or attempt to take fish during any part of a charter vessel fishing trip. Unguided anglers typically use their own vessels and equipment, or they may rent a vessel and fish with no assistance from a guide.

A charter vessel angler is defined at 50 CFR 300.61 as a person, paying or non-paying, receiving sport fishing guide services for halibut.

Sport fishing guide services is defined at 50 CFR 300.61 as assistance, for compensation or with the intent to receive compensation, to a person who is sport fishing, to take or attempt to take halibut by accompanying or physically directing the sport fisherman in sport fishing activities during any part of a charter vessel fishing trip.

4.2.2.1 Guided Sport (Charter)

The Council recommended and NMFS implemented a CSP for guided sport (charter) and commercial IFQ halibut fisheries in IPHC Regulatory Areas 2C and 3A on January 13, 2014 (78 FR 75844, December 12, 2013; see Section 4.2.3 and Figure 7). The Area 2C and 3A CSP regulations are codified at 50 CFR 300.65. The CSP defines an annual process for allocating halibut between the commercial and charter fisheries so that each sector's allocation varies in proportion to halibut abundance, specifies a public process for setting annual management measures, and authorizes limited annual leases of commercial IFQ for use in the charter fishery as guided angler fish (GAF). Current operations in Areas 2C and 3A account for more than 99 percent of the charter halibut operations for the State of Alaska (ADF&G 2014). Halibut charter operations for Areas 3B and 4 are not included in the CSP. According to 2013 ADF&G estimates, these operations represent less than 0.4 percent of the Alaska's charter/non-charter recreational yield. For charter anglers in all IPHC regulatory areas in Alaska except Areas 2C and 3A, the regulations are the same as for unguided anglers (see Section 4.2.2.2). For additional information on the management history of the charter sector (e.g., a history of the guideline harvest levels), the development of the catch sharing plan, or charter sector harvest comparisons to non-guided and subsistence fisheries, see NPFMC 2013.

The Council and NMFS developed specific management programs for the charter halibut fishery to achieve allocation and conservation objectives for the halibut fishery. These management programs are also intended to maintain stability and economic viability in the charter fishery by establishing 1) limits on the number of participants, 2) allocations of halibut that vary with abundance, and 3) a process for determining annual charter angler harvest restrictions to limit charter fishery harvest to the established allocations. The charter halibut fishery in Areas 2C and 3A is managed under the Charter Halibut Limited Access Program (CHLAP) and the CSP. The CHLAP limits the number of operators in the charter fishery, while the CSP establishes annual allocations to the charter and commercial fisheries and describes a

process for determining annual management measures to limit charter harvest to the allocations in each management area.

A charter vessel fishing trip is defined at 50 CFR 300.61 as the time period between the first deployment of fishing gear into the water from a charter vessel by a charter vessel angler and the offloading of one or more charter vessel anglers or any halibut from that vessel.

Relevant new regulations for the charter halibut fishery in Area 2C and Area 3A for 2017 are listed below.

Regulations Applicable to Both Areas

- Sport fishery season dates: February 1 through December 31, 2017.
- Allowable gear: Charter vessel anglers may use a single line with no more than two hooks attached or a spear to fish for halibut. No other gear types are allowed.
- Possession limit: The possession limit is two daily bag limits.
- Tagged halibut exemption: Halibut with an external IPHC tag will not count against sport daily bag limits or possession limits, can be retained outside of sport fishing seasons, and are not limited to size restrictions.

Area 2C (Southeast Alaska)

- One fish daily bag limit: Charter vessel anglers may catch and retain one halibut per day.
- Reverse slot limit: Retained halibut must be less than or equal to 44 inches or greater than or equal to 80 inches in length. This reverse slot limit allows anglers to keep halibut less than approximately 30 pounds and greater than 208 pounds, after the head and guts have been removed.

Area 3A (South-central Alaska)

- Two fish daily bag limit: Charter vessel anglers may catch and retain two halibut per day.
- 28-inch maximum size limit on one fish: Charter vessel anglers may keep one fish of any size per day and one fish that is no more than 28 inches in length. The 28-inch maximum size limit allows anglers to keep a second fish that weighs approximately 7 pounds, after the head and guts have been removed.
- Trip limit: Charter vessels may only take one trip per day during which charter vessel anglers retain halibut. Charter halibut permits may only be used for one charter halibut fishing trip per day during which charter vessel anglers retain halibut.
- 4-fish annual limit: Charter anglers may catch and retain no more than four halibut in a calendar year on charter vessel fishing trips in Area 3A. This annual limit does not apply to halibut caught while fishing without a guide, charter fishing in Area 2C, or halibut caught as GAF. Anglers are required to record halibut caught on charter vessel fishing trips in Area 3A on the back of the fishing license or harvest record card.
- Wednesday closure: Charter vessel anglers may not catch and retain halibut (except GAF) on Wednesdays.
- Tuesday closure: Charter vessel anglers may not catch and retain halibut (except GAF) on three Tuesdays in 2017: July 18, July 25, and August 1.

4.2.2.1.1 Guided Angler Fish (GAF)

In 2014, NMFS implemented the GAF Program as part of the CSP for IPHC Regulatory Areas 2C and 3A (see Section 4.2.3 and Figure 7). The GAF Program authorizes limited annual transfers of commercial halibut IFQ as GAF to qualified charter halibut permit holders for harvest by charter vessel anglers in Area 2C and Area 3A. Using GAF, qualified charter halibut permit holders may offer charter vessel anglers the opportunity to retain halibut of any size up to the limit for unguided anglers when the charter management measure in place limits charter vessel anglers to more restrictive size or harvest limits.

For 2016, charter vessel anglers in Area 2C were limited to one halibut per day that was less than or equal to 43 inches or greater than or equal to 80 inches total length. In Area 3A, charter vessel anglers were allowed to keep two fish per day. If two fish were kept, one had to be less than or equal to 28 inches total length. Additionally, charter anglers in Area 3A had a 4-fish annual limit. Charter vessels in Area 3A were limited to one trip per day, and no charter fishing for halibut was allowed in Area 3A on Wednesdays for the entire season. Using GAF, charter vessel anglers in Area 2C and Area 3A could harvest up to two halibut of any size per day, and GAF were not subject to the annual limit or daily closures in Area 3A. Additional information can be found in the GAF 2016 Annual Report (Scheurer 2016).

4.2.2.2 Unguided

The following Sport Fishing Regulations are excerpted from IPHC annual management measures for 2017 published in the *Federal Register* (82 FR 12730, March 7, 2017). If you are fishing with a guide in Area 2C or 3A, additional restrictions apply. Relevant regulations follow.

- Sport Fishing for Halibut — General
    - No person shall engage in sport fishing for halibut using gear other than a single line with no more than two hooks attached; or a spear.
    - Any halibut brought aboard a vessel and not immediately returned to the sea with a minimum of injury will be included in the daily bag limit of the person catching the halibut.

- Sport Fishing for Halibut — In Convention waters in and off Alaska:*
    - The sport fishing season is from February 1 to December 31, each year.
    - The daily bag limit is two halibut of any size per day per person unless a more restrictive bag limit applies in IPHC regulations or Federal regulations at 50 CFR 300.65.
    - No person may possess more than two daily bag limits.
    - Halibut in excess of the possession limit may be possessed on a vessel that does not contain sport fishing gear, fishing rods, hand lines, or gaffs.

*NMFS could implement more restrictive regulations for the sport fishery or components of it; therefore, anglers are advised to check the current Federal or State regulations prior to fishing.

4.2.3 Catch Allocation

4.2.3.1 Catch Sharing Plan for Area 2C and Area 3A — Allocating Halibut between the Charter and Commercial Fisheries

Under the CSP, the IPHC recommends combined catch limits (CCLs) for the charter and commercial halibut fisheries in Areas 2C and 3A. Each CCL includes estimates of discard mortality (wastage) for each fishery. More information is provided in the final rule implementing the CSP (78 FR 75844, December 12, 2013). Implementing regulations for the CSP are at 50 CFR 300.65. The Area 2C and Area 3A CSP allocation tables are located in Tables 1 through 4 of subpart E of 50 CFR part 300.

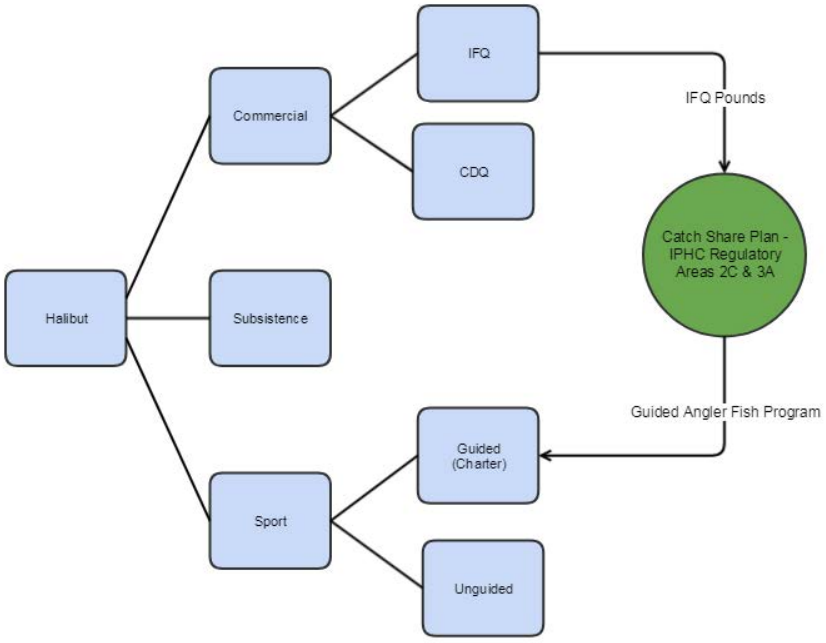

Figure 7 Diagram of the quota sharing in the CSP for Area 2C and Area 3A.

4.2.4 Subsistence

A 2014 Technical Report (IPHC 2014) on halibut biology, fisheries, and management by the IPHC staff provides the following information regarding subsistence harvest of halibut.

> Pacific halibut were fished historically by the indigenous peoples inhabiting the lands bordering the north Pacific, and was included in the diet of many groups who conducted their fishery by hook and line from large canoes, which could venture as far as 20 miles from shore (32 km). The hooks were elaborately carved and were selective for large fish suitable for drying and smoking. The technique of these fishers was well developed and very efficient as the following excerpt by F. Boas explains:
>
> > Halibut are caught with hooks made of crooked branches of red or yellow cedar, attached to fishing-lines made of red cedar bark sixty fathoms long. The halibut hook is tied to the fishing line with split spruceroots. Devilfish (octopus) is used as bait. The fishing lines are taken out by the fishermen in their canoes and thrown overboard. After a while they are pulled up again. After the halibut

> hooks have been taken up, the fish are killed by clubbing. Then hooks are thrown back into the water. At this place it is said that there were two fishermen in the canoe, who distinguished the halibut they had caught by placing them with the head toward the owner. The fishermen had his knees covered with a mat.
>
> Today, in addition to providing active commercial and sport fisheries, halibut continues to be an important subsistence and ceremonial fish. Subsistence halibut is a traditional food that has always been relied on to feed the communities. Ceremonially, halibut is used to feed people at culturally important events like weddings, funerals, and naming ceremonies. Several tribes in the U.S. have specific allocations or boundaries for their usage only.

Subsistence halibut is halibut caught by a rural resident or a member of an Alaska Native tribe for direct personal or family consumption as food, sharing for personal or family consumption as food, or customary trade. Before fishing under the subsistence halibut regulations, fishermen must obtain a Subsistence Halibut Registration Certificate (SHARC). Special permits for community harvest, ceremonial, and educational purposes also are available to qualified Alaska communities and Alaska Native tribes. Permit holders must comply with SHARC registration and reporting processes.

Subsistence fishing is limited to setline gear and hand-held gear, including longline, handline, rod and reel, spear, jig, and hand-troll gear (see 50 CFR 300.65(h)(1)). Power troll gear is not allowed.

This is a summary of regulations governing the subsistence halibut fishery and is not the complete list of limitations and prohibitions specific to this program. See 50 CFR 300.2, 300.4, 300.60, 300.61, 300.65, and 300.66 and annual management measures published in the *Federal Register*, pursuant to 50 CFR 300.62 for actual regulatory requirements. Subsistence halibut gear and harvest limits by regulatory area and permit type (50 CFR 300.65(h)(I)(i) and 50 CFR 300.65(h)(2)) can be found in the Appendix (Table 13, Table 14).

4.2.5 Description of Gear

A 2014 IPHC Technical Report (IPHC 2014) on halibut biology, fisheries, and management provides the following information regarding gear used to harvest halibut.

> Halibut are oftentimes fished in tandem with sablefish, and many fishers are choosing to use sablefish or combination gear, which utilize smaller hooks at a closer spacing, for both tasks.
>
> In the early years of the fishery, the groundline was formed by splicing together a number of lines, each 300 feet (91 m) in length. The number of lines varied considerably, but the sixline skate (1,800 feet or 549 m) eventually was adopted by most. Groundline is now sold in 1,800-foot (549 m) coils.
>
> The interval between hooks or "rig" of the gear varies from 3 feet (0.9 m) to as much as 42 feet (13 m) depending on gear and fishing target. Most halibut gear today is rigged 12 to 18 feet (3.7 to 5.5 m) and about 70 percent of the catch comes from spacing at 9 feet (2.7 m) or greater.
>
> The lines of conventional setline gear were originally made of natural fibers such as hemp, cotton, manila, or sisal, depending on their availability, quality, and cost. These

natural fibers now have largely been replaced with man-made materials, mainly nylon. In 1982 and 1983 fishers converted to circle-shaped hooks from the traditional J-shaped hooks. IPHC studies indicate that circle hooks are two to three times more efficient at catching halibut than J-hooks, depending on fish size. The reason for this is better hooking qualities, as well as lower escape rates once the fish are on the hooks. Large hooks are most commonly used when targeting halibut exclusively and smaller hooks are more common when targeting other species simultaneously, such as sablefish.

The skates are tied together and set in strings of 4 to 12 skates each. The number of skates per string depends on factors such as the size of the fishing grounds and the likelihood of snagging on the bottom. Each end of the string is attached to an anchor and buoy line and marked at the surface with a buoy, flagpole, and flag. When fishing at night or in heavy fog, lights or radar reflectors are used on each flagpole to aid in locating the gear. Depending upon the grounds, time of year, and bait used, most of the gear is left in the water, or "soaked," for 4 to 24 hours, but the average soak for each skate is about 12 hours. Extensive soak times have been directly related to sand flea (a small amphipod) predation, which will kill the fish and make it unmarketable. Sand fleas are usually more active at night, prompting many fishers to try to retrieve their gear before the dark hours. Most fishing is conducted in depths ranging from 15 to 150 fathoms (27 to 274 m); up to 700 fathoms (1,280 m) if also fishing for sablefish.

Baits used in the halibut fishery are either fresh or frozen and include herring, octopus, salmon, squid, shad, and "shack" or "gurdy" bait which consists of species caught incidentally on the halibut gear. Much of the frozen herring, squid, and shad comes from the eastern U.S. or fisheries outside the U.S.

Contemporary demersal hook-and-line gear uses fixed hooks strung along a ground line. The ground line can be several miles long, and can have thousands of baited hooks attached. Besides halibut, commercial vessels using demersal hook-and-line gear also target Pacific cod, sablefish, turbot, and some rockfish species (AFSC 2015). The following gears are used in the commercial halibut fishery.

4.2.5.1 Conventional gear

The 2014 IPHC Technical Report (IPHC 2014) provides the following information regarding conventional gear used to harvest halibut.

> Traditionally, a unit (skate) of conventional setline gear or fixed gear consists of groundline, gangions, and hooks. Loops of light twine (beckets) are attached at regular intervals to the groundline. Short branch lines (gangions) three to four feet (0.9 to 1.2 m) long are attached to the beckets and a hook is attached to the end of each gangion. The most common rigs are 3, 3.5, 9, 12, and 18 feet, (0.9, 1.1, 2.7, 3.7, and 5.5 m) as those intervals facilitate baiting the hooks and coiling the lines. The skates with the baited hooks are set over a chute at the stern of the vessel. A variant of conventional gear, called tub gear, involves the harvesters coiling the groundline in plastic tubs (either half-skate or full-skate tubs) and notching the hook end of the gangions in slots which have been cut around the edge of the tub. This gear requires less expertise to coil and results in fewer snarls during setting.

The gear is retrieved on a power-driven wheel (gurdy). One person stands at the roller, tending the gear and fish as they come aboard, and one person coils the line after it passes the gurdy. The gear is then inspected for necessary repairs, baited, and recoiled in preparation for the next set.

4.2.5.2 Snap gear

The 2014 IPHC Technical Report (IPHC 2014) provides the following information regarding snap gear used to harvest halibut.

> Snap gear differs from traditional setline gear in that the branch lines (gangions) are attached to the groundline with removable metal snaps rather than being tied to the groundline with twine. Further, the groundline used for snap gear is one continuous line that is simply stored on a drum after the gangions are removed, instead of being separately coiled. The method of attaching the hooks to the gangions is the same for snap gear and traditional gear. In recent years, some fishers have incorporated swivels, which act as rotating joints between the snap and gangion, the gangion and hook, or occasionally at both joints. When rockfish or dogfish are hooked, they tend to spin. It is thought that swivels extend the life of the gear and decrease the likelihood a fish will "spin off" the gear. The IPHC is developing analyses to account for swivel usage and any differential impacts on halibut catch rates.
>
> Gangions with snaps and baited hooks are stored on racks, and a fisher snaps the gangions to the groundline as it unwinds from the drum during setting. Hook intervals can be changed with each set or within a set. When the gear is retrieved, the gangions are unsnapped as the groundline is rewound on the drum.
>
> For small boats with only two or three fishers, snap gear has several advantages over traditional gear. First, storing the groundline on a drum eliminates the need for a person to coil gear and reduces the amount of storage space required. Although catch rates tend to be higher with traditional gear on a larger boat, more snap gear can usually be set by a small crew than it would be able to handle in the traditional manner. Another advantage is that the hooks can be widely spaced when prospecting for fish and more closely spaced when a concentration of fish is located. These advantages coupled with the relatively low capital investment for a small boat were some of the reasons for hundreds of new fishers entering the fishery in the 1970s.

4.2.5.3 Autoline gear

The 2014 IPHC Technical Report (IPHC 2014) provides the following information regarding autoline gear used to harvest halibut.

> Autoline gear is a third type of gear used in the longline fishery. Although not ordinarily found on a halibut-only vessel, this type of gear is used frequently to fish for Pacific cod and sometimes sablefish. If a vessel is fishing for multiple species at one time, this gear may be used for halibut as well. As with conventional gear, the gangions are tied to the groundline at fixed intervals, but the autoline gear is unique because the hooks are stored on a magazine and then automatically baited as the gear is set. Upon hauling, the hooks are automatically cleared and replaced on the magazine for the next set. The gangions are generally shorter and closer together than on conventional gear, and there

is no need for crew members to coil during hauling or to bait the individual hooks. Bent and broken hooks and gangions can be replaced when the gear is in the storage magazine. The disadvantage is that the system is costly to purchase and maintain, and outgoing hooks sometimes go unbaited.

4.2.5.4 Longline pot gear

On December 28, 2016, NMFS published a final rule to authorize longline pot gear for the IFQ sablefish fishery in the GOA (81 FR 95435). The GOA sablefish fishery takes place in a portion of IPHC Regulatory Area 2C (not including the inside waters), and Regulatory Areas 3A, 3B, and that portion of Area 4A in the GOA west of Area 3B and east of 170°00' W. longitude. The NMFS final rule requires retention of halibut caught incidentally in the groundfish fisheries in longline pot gear subject to current retention requirements for the halibut IFQ Program (i.e., only if the halibut are of legal size and a person[s] on the vessel holds sufficient halibut IFQ). This recommendation is intended to avoid discard mortality of legal-size halibut caught incidentally in longline pots in the sablefish IFQ fishery, similar to current regulations that authorize sablefish and halibut IFQ holders using hook-and-line gear to retain legal-size halibut caught incidentally during the sablefish IFQ fishery.

At its 2016 annual meeting, the IPHC approved longline pot gear, as defined by NMFS, as legal gear for the commercial halibut fishery in Alaska when NMFS regulations permit the use of this gear in the IFQ sablefish fishery. NMFS authorized the use of longline pot gear in the IFQ sablefish fishery on March 11, 2017 (81 FR 95435, December 28, 2016; notice of delayed effective date 82 FR 9690, February 8, 2017). Vessels using longline pot gear to harvest IFQ sablefish in the GOA must now retain halibut consistent with IPHC regulations and NMFS regulations specified in this final rule.

4.2.6 Observer coverage

The Observer Program monitors catch, bycatch, and marine mammal and seabird interactions in Alaska's federally managed commercial groundfish and halibut fisheries. The information collected by NMFS-certified observers (observers) provides scientific information for managing the commercial groundfish and halibut fisheries and minimizing bycatch; there is no observer coverage for subsistence or sport halibut. High quality observer data are the cornerstone of Alaska fisheries management.

Information collected by observers, used in conjunction with reporting and weighing requirements, provides the foundation for inseason management and for tracking species-specific catch and bycatch amounts. All observers entering the Observer Program receive training on seabird data collection responsibilities and how to identify dead seabirds, as well as specific information for the identification of species of interest including short-tailed albatross, red legged kittiwake, Steller's and spectacled eiders, and marbled and Kittlitz's murrelets. This training is provided during their initial 3-week certification course. Each subsequent year, observers receive a briefing before their first deployment that reviews seabird data collection and identifications.

The most substantial changes to the structure of the Observer Program took effect in January 2013 (77 FR 70062, November 21, 2012). These changes increased the statistical reliability of data collected by the program and expanded observer coverage to previously unobserved fisheries. All sectors of the groundfish fishery are included in the Observer Program, including vessels less than 60 ft LOA and the commercial halibut sector, which were not covered under the previous program. The restructured

Observer Program dramatically reduced the proportion of trips in the commercial halibut fleet that are not subject to observer coverage, which provides data that better represents the fishery.

The Observer Program annual deployment plan (ADP), developed by NMFS in consultation with the Council, is used to assign observers to collect independent information from fishing operations under the BSAI and GOA groundfish FMPs and the Halibut Act. The 2017 ADP (NMFS 2016b) is available on the NMFS Alaska Region web site.

The ADP focuses on a science driven deployment of observers to reduce potential bias and meet NMFS's data needs. Some aspects of observer deployment can be adjusted through the ADP, including the assignment of vessels to the selection pools or the allocation strategy used to deploy observers in the partial coverage category. Under the current Observer Program, all catcher vessels (CVs) and catcher/processors (CPs) that participate in federally managed or parallel groundfish and halibut fisheries off Alaska are assigned to one of two categories, based on data needs associated with specific management programs: 1) the full observer coverage category, where vessels and processors have at least one observer present for all fishing activity; or 2) the partial observer coverage category, where NMFS determines when and where observer coverage is needed. CPs are typically in the full coverage category, and CVs are typically in the partial coverage category as defined at 50 CFR 679.51(a). Each year the ADP describes how observer coverage days will be assigned within the partial coverage category. Each June, NMFS presents the Observer Program annual report to the Council which analyzes observer deployment and recommends changes to the next ADP to improve data quality.

Commercial halibut vessels in the full coverage category include CPs (with limited exceptions). Vessels and processors in the full coverage category obtain observers by contracting directly with observer provider companies. All CPs in this category are required to have 100 percent observer coverage. Observers monitor all trips and typically sample between 50 percent and 100 percent of the individual hauls (Cahalan et al. 2014). Then, based primarily on observer data, with industry and vessel reports providing a small percentage of the data, catch estimates are determined (Cahalan et al. 2014).

Commercial halibut vessels in the partial coverage category include CVs when fishing for halibut IFQ or CDQ. Each year, the ADP defines and sets coverage rates for the partial coverage strata, which consists of two pools—the trip selection pool and the no selection pool. The owner or operator of a vessel in the trip selection pool must register each fishing trip in the Observer Declare and Deploy System, which is programmed to randomly select trips for observer coverage based on the assigned annual selection rate for each stratum. In the partial coverage category in 2016, the selection rates were determined by the gear type used on each fishing trip; in 2017, the selection rates are determined by gear and whether the vessel delivers its harvest to a tender vessel

Vessels in the no selection pool are not selected for observer coverage. CVs less than 40 ft LOA, vessels fishing with jig gear, and vessels carrying electronic monitoring (EM) systems are in the no selection pool and do not carry an observer in 2017.

NMFS has the authority to place observers on any vessel in the partial coverage category, which encompasses vessels of all sizes. However, recognizing the challenging logistics of putting observers on small vessels, NMFS and the Council have recommended that vessels less than 40 ft LOA be in the no selection pool; therefore, these vessels have not been subject to observer coverage. In 2015, 53 percent of trips in the halibut fleet and 17 percent of catch occurred on vessels less than 40 ft LOA. For this

portion of the fleet, NMFS uses observer data from vessels over 40 ft in the same fishery and area to generate estimates of at-sea discards.

NMFS publishes the Observer Program annual report with descriptive information for the whole Observer Program, and a scientific evaluation of the deployment of observers in the partial observer coverage category. According to the 2015 annual report (NMFS 2016a), NMFS deployed observers for 5,318 days in 2015. Among all fishing in Federal fisheries off Alaska in 2015, 4,859 trips (39.1 percent) and 498 vessels (42.1 percent) were observed (NMFS 2016a).

NMFS and the Council are working on incorporating EM into the Observer Program and view EM as a potential mechanism for gathering data on vessels less than 40 ft LOA that could have trouble accommodating an observer.

In Alaska, EM technologies are used for compliance monitoring. Two types of EM are used: vessel monitoring system and camera-based systems. NMFS published a proposed rule on March 23, 2017 (82 FR 14853), to integrate electronic monitoring in the Observer Program. This rule, if implemented, would allow vessels in the partial observer coverage category using nontrawl gear to select to have electronic equipment (cameras and other sensors) deployed aboard their vessels in lieu of an observer to monitor catch and discards. This would be the first use of EM for catch accounting in the United States. If approved, this rulemaking would bring EM as an option into the established Observer Program process, by which the Council and NMFS make annual policy choices to determine the best monitoring tool for the Alaska fixed gear fisheries, including halibut fishing vessels. Through that process, the Council and NMFS would consider how to optimize observer and EM deployment for fisheries in the partial coverage category each year, based on an analysis of costs, budget, fishing effort, and monitoring needs.

4.2.7 Data collection

Three data sources are used in this biological assessment. Each is discussed below.

NMFS Alaska Region Catch Accounting System (CAS)
In this biological assessment, the NMFS Alaska Region CAS data are used to estimate seabird bycatch in the commercial halibut fishery. A description of these data collection methods follows.

Total catch estimates in the commercial groundfish and halibut fisheries off Alaska are generated by the NMFS Alaska Region. The system uses information from multiple data sources to provide an estimate of total groundfish and halibut catch, including at-sea discards, and estimates of PSC and other non-target bycatch (Figure 8). Observer information, dealer landing reports (“fish tickets”), and at-sea production reports are combined to provide an integrated source for fisheries monitoring and inseason decision making.

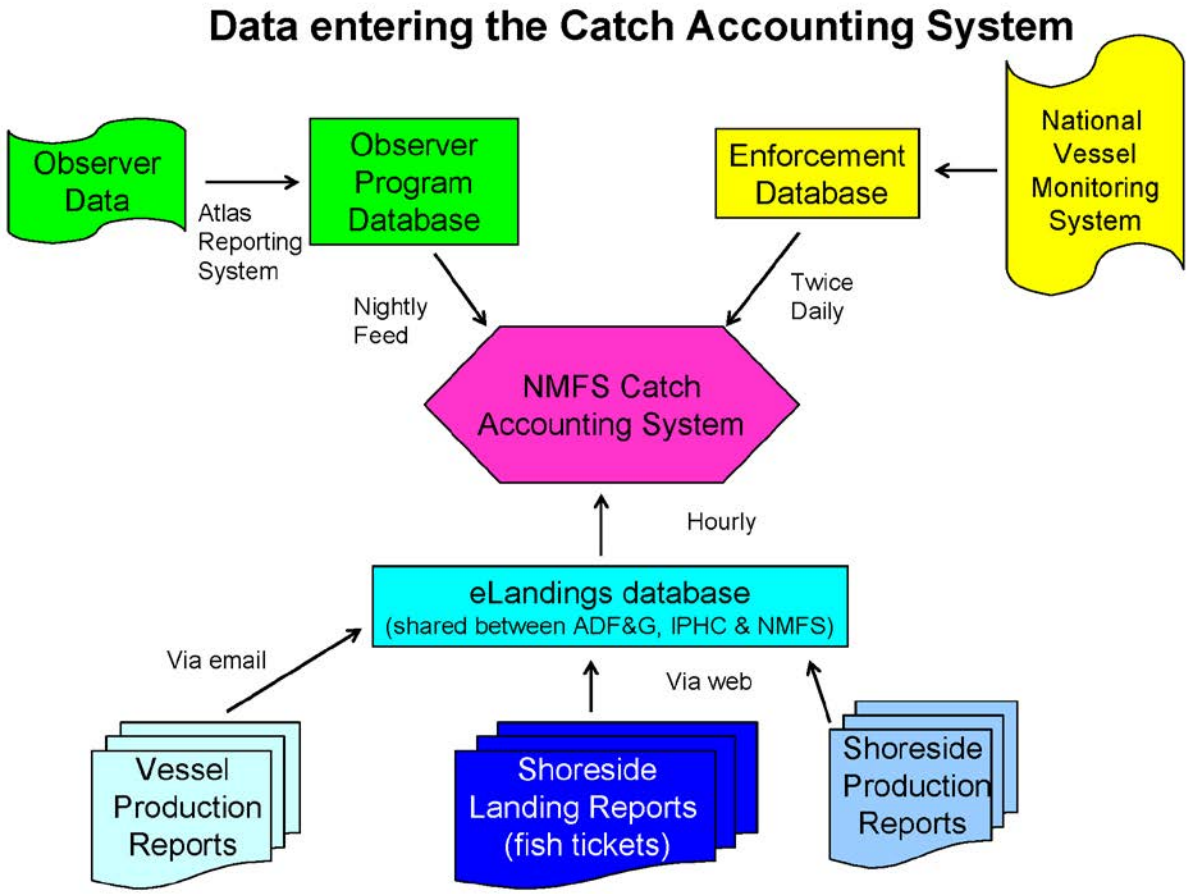

Figure 8 Catch Accounting System diagram showing data sources. Source: https://alaskafisheries.noaa.gov/sites/default/files/cas_diagram.pdf

A detailed description of the current catch estimation methods was published by Cahalan et al. (2014). Cahalan et al. (2014) updates the description of the CAS procedures that were published by Cahalan et al. (2010).

The observer information from the at-sea samples is used to create bycatch rates that are applied to unobserved vessels. For trips that are unobserved, the bycatch rates are applied to industry supplied landings of retained catch. Expanding on the observer data that are available, the extrapolation from observed vessels to unobserved vessels is based on varying levels of aggregated data (post-stratification). Data are matched based on processing sector (e.g., CP or CV), week, target fishery, gear, and Federal reporting area. In the CAS, observer data are also used to create seabird bycatch rates (a ratio of the estimated bycatch to the estimated total catch in sampled hauls). NMFS has estimated seabird bycatch in the groundfish fisheries off Alaska using CAS since 2007 and in the commercial halibut fishery since 2013 (Fitzgerald et al. 2013; AFSC 2014).

Observers are usually able to identify an incidentally caught albatross unless it is not retained—it either falls off the hook or is knocked off the hook by the rollerman as gear is brought on board. All incidentally caught birds are recorded in the species composition sample during the observer's random sampling tally period. Photographs may be taken of retained birds, and the specimens of species of interest may be preserved for further identification confirmation. Observers record species

identification features for all incidentally caught birds. Observers are able to identify to species some incidentally caught birds that are not retained. If an observer thinks a short-tailed albatross has been taken, but not retained (regardless of when it occurred), the observer notifies NMFS, which convenes a panel of experts. Composed primarily of NMFS and USFWS staff, but including others who may have expertise on seabird identification, this panel will discuss the incident with the observer to determine whether any diagnostic species identification features were seen by the observer. Based on this discussion the observer submits his or her final determination, and the panel of experts provides the Observer Program with their verification of the identification made by the observer. The bird is then entered into the CAS database and included in seabird bycatch extrapolations. If the bird was taken outside the observer sample, it is recorded separately and is not included in seabird bycatch extrapolations. If the bird is a short-tailed albatross it is counted towards the incidental take limit and a formal notice is prepared.

NMFS Alaska Region Restricted Access Management (RAM)

In this biological assessment, the NMFS Alaska Region RAM data are used for number of unique commercial fishing vessels by gear and location, weight of halibut harvested by gear and location, and vessel length descriptive statistics. NMFS Alaska Region RAM data presented in this biological assessment include IFQ and CDQ landings from 2009 through 2016. Data since 2009 provides a representative look at the commercial halibut fishery before and after Observer Program implementation in 2013. A description of these data collection methods follows.

IFQ and CDQ landings data are reported by persons issued a registered buyer permit who receives IFQ and/or CDQ halibut from an IFQ or CDQ permit holder. The registered buyer landing report includes information on landing data and location, harvester information, and weight. All retained IFQ and CDQ halibut catch must be weighed, reported, and debited from the appropriate IFQ or CDQ account. To ensure proper and timely catch reporting in the IFQ Program, an electronic reporting system is used. The Interagency Electronic Reporting System (IERS) and its reporting component, eLandings, is a joint system developed under the partnership of NMFS Alaska Region, ADF&G, and the IPHC. This system ensures that deductions are attributed to the appropriate accounts and catch is accounted. The eLandings system allows entry of IFQ landings and provides a printed fish ticket as a landing receipt, as well as receipts for IFQ account debits. Data are received into a central repository database and used to populate separate agency management and enforcement databases. There are also non-electronic mechanisms for reporting fish landings in a situation where the Internet may be unavailable.

NMFS Alaska Region RAM data include Pacific halibut catch reported in net weight pounds—head-off, dressed, and ice/slime deducted—but for this biological assessment, catch has been converted to round weight in metric tons. Halibut discards as wastage or prohibited species catch are not included.

For vessel length data, vessel length categories are assigned based on the vessel LOA. If a vessel fished more than one gear type or FMP area in a year, it is included in more than one category's vessel count. The “All” gear and “All” area vessel counts provide a unique vessel count for the year with no duplicate counting.

International Pacific Halibut Commission (IPHC)

In this biological assessment, the IPHC data are used for number of unique commercial halibut vessels by season and location, weight of halibut harvested by season and location, and the number of hooks by season and location. IPHC data are from the IFQ and CDQ sectors from 2009 through 2015. A description of these data collection methods follows.

Logbook data: Commercial Pacific halibut catch (net weight pounds—head-off, dressed, ice/slime deducted) and associated raw hook counts by year, IPHC regulatory area, 3-month grouping, and target are from vessel logbook data. There is not 100 percent logbook coverage, so these data only represent a fraction of the total commercial halibut catch. The hook counts are calculated values: (number of skates set) multiplied by (number of hooks/skate). Separating this data by gear type was not possible due to confidentiality issues. For reasons of confidentiality, the IPHC is unable to release data where less than three entities (e.g., vessels) are represented. This was also the reason for using 3-month groupings. 2016 data are not included as the IPHC was still in the process of editing that information at the time the data was requested (March 2017).

Hook-and-line sets that were targeting halibut, halibut plus other species, or other species but halibut were caught incidentally (halibut were generally legally landed and covered by quota shares) are included (this includes sets targeting halibut with zero halibut catch). Only sets that caught halibut were included in the hook counts where other species were being targeted but halibut were caught incidentally. In IPHC terms, bycatch is fish caught incidentally while targeting another species and cannot be legally retained. There is some overlap in the vessels that targeted halibut plus other species, or other species but halibut were caught incidentally. That overlap (double-counting of vessels) was accounted for in these analyses concerning unique vessel counts.

Fish ticket data: These data are a more complete representation of the total halibut catch by year, IPHC regulatory area, and 3-month group. However, these data do not include hook counts and as such were only used when examining unique vessel counts or halibut catch. Differences may be seen between the logbook data and the fish ticket data because the logbook data are based on catch date and the fish ticket data are based on landing date. Therefore, some of the poundage caught in one 3-month group may have been delivered in the next 3-month group.

4.2.8 Seabird bycatch mitigation in the Alaskan halibut fisheries

Seabird bycatch in the halibut fisheries off Alaska has only been reported in fisheries employing hook-and-line gear. Since 1997, NMFS has implemented and revised seabird avoidance measures to mitigate interactions between the Federal fisheries using hook-and-line gear and seabirds (62 FR 23176, April 29, 1997; 63 FR 11161, March 6, 1998; 69 FR 1930, January 13, 2004; 72 FR 71601, December 18, 2007; and 74 FR 13355, March 27, 2009). A brief history of seabird avoidance measures required for hook-and-line gear in the commercial halibut fishery off Alaska is outlined below:

> April 1998 — The commercial Pacific halibut fishery in U.S. Convention waters off Alaska was required to conduct fishing operations in a specified manner and to employ specified measures intended to reduce seabird bycatch and incidental seabird mortality. Regulations requiring seabird bycatch avoidance measures in the groundfish hook-and-line fisheries of the BSAI and the GOA were amended to exempt small vessels from some of the requirements and to clarify that if offal is discharged while gear is being hauled, it must be discharged in a manner that distracts seabirds, to the extent practicable, from baited hooks (63 FR 11161, March 6, 1998).
>
> 1999 through 2000 — Field studies on seabird mitigation in the Alaska groundfish and halibut hook-and-line fisheries were undertaken by the University of Washington Sea Grant Program and supported by the AFSC and industry. These are the largest seabird mitigation studies conducted to date.

February 2004 — Seabird avoidance measures were revised for the Alaska groundfish and halibut hook-and-line fisheries. The final rule strengthened gear standards for small vessels and eliminated certain seabird avoidance requirements that were not needed (69 FR 1930, January 13, 2004).

April 2009 — Seabird avoidance requirements for the groundfish and halibut hook-and-line fisheries in IPHC Area 4E were revised. The final rule eliminated seabird avoidance requirements for hook-and-line vessels less than or equal to 55 ft (16.8 m) LOA in portions of Area 4E in the eastern Bering Sea (74 FR 13355, March 27, 2009).

See 50 CFR 679.24(e) and 679.51(e)(1)(viii)(F) for complete seabird avoidance program requirements for vessels fishing with hook-and-line gear; see § 679.24(e)(1) for applicable fisheries (74 FR 13358, March 27, 2009; Table 20 to 50 CFR part 679). A summary of the seabird avoidance program requirements for the commercial (IFQ and CDQ) Pacific halibut fishery follows.

Seabird avoidance measures are required to be used by operators of vessels greater than 26 ft LOA using hook-and-line gear fishing for Pacific halibut in the IFQ and CDQ management programs. Requirements for seabird avoidance gear must be used on hook-and-line vessels greater than 26 ft (7.9 m) LOA and less than or equal to 55 ft (16.8 m) LOA fishing in the Exclusive Economic Zone (EEZ; see 50 CFR 679.24(e)(4)(ii), (e)(4)(iii), and (e)(4)(iv) for the specific standards). An exemption from seabird avoidance regulations exists for operators of vessels less than or equal to 32 ft (9.8 m) LOA using hook-and-line gear in IPHC Area 4E in waters shoreward of the EEZ.

Figure 9 Exemptions from seabird avoidance measures include hook-and-line vessels: A) <32 ft. LOA in the State waters (0 to 3 nm) of IPHC Area 4E; B) ≤55 ft. LOA in IPHC Area 4E but not including waters south of 60°00.00 N. lat. and west of 160°00.00 W. long.; C) In State waters (0 to 3 nm) of Cook Inlet; D) In NMFS Reporting Area 649 (Prince William Sound); and E) In Southeast Alaska – NMFS Reporting Area 659, excluding transition areas (see Figure 10).

Because short-tailed albatross are not known to frequent these following inside waters (69 FR 1930, January 13, 2004), seabird avoidance requirements are not required for hook-and-line vessels fishing in Prince William Sound (NMFS Area 649), the State waters of Cook Inlet, and Southeast Alaska (NMFS Area 659) *except* for three areas in the inside waters of Southeast Alaska (Figure 10). The three transition areas where seabird avoidance gear must be used are —

- Lower Chatham Strait south of a straight line between Point Harris (latitude 56° 17.25 N.) and Port Armstrong;
- Dixon Entrance defined as the State of Alaska groundfish statistical areas 325431 and 325401; and
- Cross Sound west of a straight line from Point Wimbledon extending south through the Inian Islands to Point Lavinia (longitude 136° 21.17 E.).

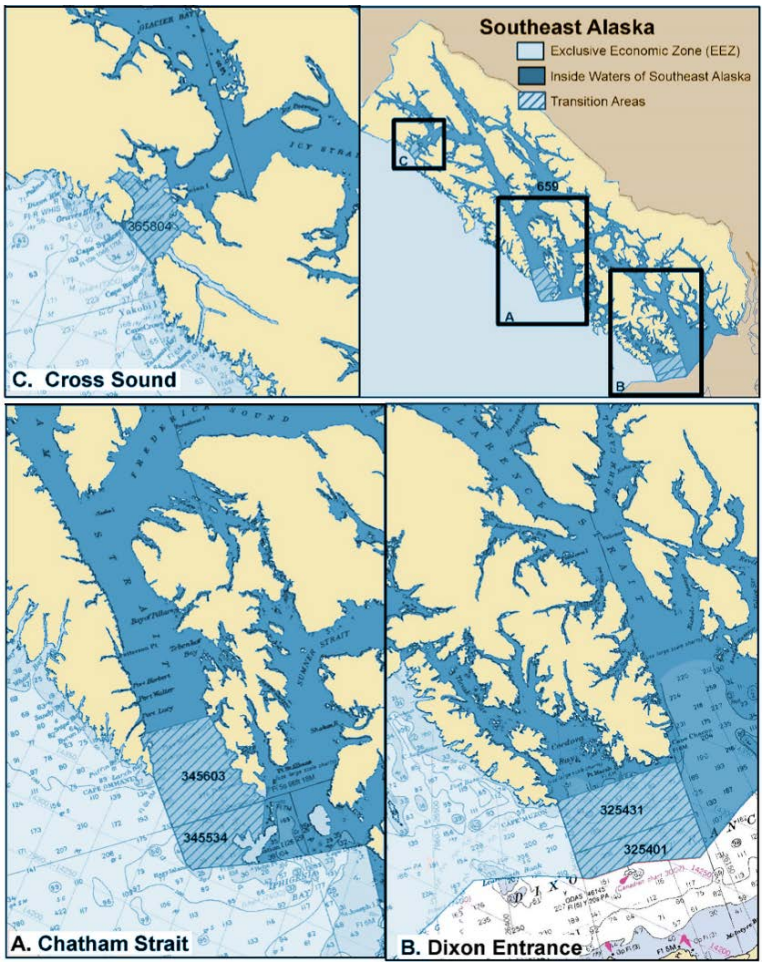

Figure 10 Transition areas for A) Chatham Strait, B) Dixon Entrance, and C) Cross Sound. In these transition areas, as in EEZ waters, seabird avoidance gear and standards are required. Available at: http://alaskafisheries.noaa.gov/protectedresources/seabirds/ea/figure1_2.pdf.

Vessels greater than 26 ft LOA and less than or equal to 55 ft LOA may use discretion with seabird avoidance requirements when winds exceed 30 knots (near gale or Beaufort 7 conditions).

The type of "bird scaring line," or streamer line, required depends on the area fished, the length of the vessel, the superstructure of the vessel, and the type of hook-and-line gear (e.g., snap gear). Larger vessels (greater than 55 ft LOA) in the EEZ must use a minimum of a paired streamer line of a specified performance and material standard. Smaller vessels (greater than 26 ft LOA and less than or equal to 55 ft LOA) must use a minimum of a single streamer line or, in limited instances, a minimum of one buoy bag line. See Table 4 and the regulations at 50 CFR 679.24(e)(2) for more specific requirements.

Table 4 Seabird avoidance gear requirements for vessels, based on area, gear, and vessel type.

If you operate a vessel deploying hook-and-line gear, other than snap gear, in waters specified at § 679.24(e)(3), and your vessel is...	then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...
>26 ft to ≤55 ft LOA and without masts, poles, or rigging	minimum of one buoy bag line
>26 ft to ≤55 ft LOA and with masts, poles, or rigging	minimum of a single streamer line of a standard specified at § 679.24(e)(4)(ii)
>55 ft LOA	minimum of a paired streamer line of a standard specified at § 679.24(e)(4)(iii)
If you operate a vessel deploying hook-and-line gear and use snap gear in waters specified at § 679.24(e)(3), and your vessel is...	then you must use this seabird avoidance gear in conjunction with requirements at § 679.24(e)...
>26 ft to ≤55 ft LOA and without masts, poles, or rigging	minimum of one buoy bag line
>26 ft to ≤55 ft LOA and with masts, poles, or rigging	minimum of a single streamer line of a standard specified at § 679.24(e)(4)(iv)
>55 ft LOA	minimum of a single streamer line of a standard specified at § 679.24(e)(4)(iv)
If you operate any of the following hook-and-line vessels...	then...
<32 ft LOA in the State waters of IPHC Area 4E	you are exempt from seabird avoidance measures.
in NMFS Reporting Area 649 (Prince William Sound)	
in State waters of Cook Inlet	
in NMFS Reporting Area 659 (Eastern GOA Regulatory Area, Southeast Inside District), but not including waters in the areas south of a straight line at 56°17.25 N. lat. between Point Harris and Port Armstrong in Chatham Strait, State statistical areas 325431 and 325401, and west of a straight line at 136°21.17 E. long. from Point Wimbledon extending south through the Inian Islands to Point Lavinia	
≤55 ft LOA in IPHC Area 4E but not including waters south of 60°00.00 N. lat. and west of 160°00.00 W. long.	

If offal is discharged while gear is being set or hauled, offal should be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must be either aft of the hauling station or on the opposite side of the vessel from the hauling station. Directed discharge should be eliminated through chutes or pipes of residual bait or offal from the stern of the vessel while setting gear. For vessels not deploying gear from the stern, directed discharge of residual bait or offal should be eliminated over sinking hook-and-line gear while gear is being deployed. See 50 CFR 679.24(e)(2)(v) for more specific requirements.

If a short-tailed albatross is hooked and a fisheries observer is on board the vessel, the observer will report the short-tailed albatross take to NMFS. The USFWS will be notified of the take within 48 business day hours by NMFS. If no observer is on board the vessel, NMFS requests that the albatross specimen be retained and reported immediately to NMFS or USFWS.

As specified at 50 CFR 679.24(e)(2)(vi), every reasonable effort must be made to ensure that short-tailed albatross brought on board alive are released alive. The USFWS biological opinion for groundfish (2015) provides safe release procedures for live birds; these are recommended to fishermen in the halibut fisheries as well. This biological opinion states that live birds should be released overboard if the bird looks normal and exhibits all of the following traits: the bird is capable of holding its head erect, and the bird responds to noise and motion stimuli; the bird breathes without noise; the bird can flap both wings, and it can retract the wings to a normal folded position on the back; the bird is capable of elevating itself to stand on both feet, with its toes pointed in the proper position (forward); and the bird is dry. If the short-tailed albatross does not meet all of these criteria, then Appendix 2 of the USFWS biological opinion (USFWS 2003) provides details on how to care for the bird.

5.0 ESA-listed Species in the Action Area

NMFS has previously consulted on the effects of the commercial Pacific halibut fishery in U.S. Convention waters off Alaska on the ESA-listed short-tailed albatross.

The endangered short-tailed albatross (*P. albatrus*), threatened Steller's eider (*P. stelleri*), and threatened spectacled eider (*S. fischeri*) occur in the action area; these species are under the jurisdiction of the USFWS. In the action area, critical habitat has been designated for the Alaska-breeding population of Steller's eider (62 FR 31748, June 11, 1997; 50 CFR 17.95(b)) and for the spectacled eider (58 FR 27474, May 10, 1993; 50 CFR 17.95(b)), but not for short-tailed albatross. Effects of the Pacific halibut fisheries in U.S. Convention waters off Alaska on these three species are evaluated in this biological assessment.

6.0 Short-tailed Albatross

6.1 Species Description

Short-tailed albatross are large (body length 33 to 37 inches; wingspan 84 to 90 inches) pelagic birds in the order Procellariiformes (tube-nosed marine birds; USFWS 2008). Their wings, adapted for gliding above the water surface, are long and narrow; the large pink bill has a thin black line at its base and a blueish hooked tip with visible external nostrils. The short-tailed albatross is the largest of the three North Pacific albatross species and the only North Pacific albatross species to have an entirely white back at full maturity. Juveniles that have fledged and reached Alaska waters are dark brown to black with pale bills and legs that differentiate them from other albatross species. (USFWS 2008)

6.2 Population

At the beginning of the twentieth century, the species declined to near extinction, primarily as a result of hunting at the breeding colonies in Japan. Although population estimates of short-tailed albatross

before exploitation are not known, there are estimates of at least 300,000 breeding pairs on the island of Torishima, Japan alone (USFWS 2008). Historically, albatross were killed for their feathers and various body parts, and eggs were collected for food (USFWS 2008). Starting in about 1885, the feather trade contributed to the decline and near extinction of the short-tailed albatross. Each albatross generated about one-fourth of a pound of feathers; the down feathers were used for pillow stuffing, while the wing and tail feathers were used for quill pens and ornamentation (Austin 1949, as cited in USFWS 2008). Hunters harvested an estimated five million short-tailed albatross from the breeding colony on Torishima between approximately 1885 and 1903 (Austin 1949, as cited in USFWS 2008).

Originally numbering in the millions, the worldwide population of breeding age birds currently is estimated to be approximately 1,928 individuals, and the worldwide total population is approximately 4,354 individuals (USFWS 2014a; the population was estimated at 400 in 1988 and 700 in 1994). The current population status was recently reviewed in detail by USFWS (2014a), which stated that the"3-year running average population growth rate based on eggs laid at Torishima since 2000 ranges from 5.2 - 9.4 percent (Table 2, H. Hasegawa, pers. comm. 2014)." Thus the population at Torishima is growing. However, the recovery criteria (described in Section 6.6) require two other breeding colonies to grow at these rates which is not occurring at this time (see Section 6.6 for additional discussion).

6.3 Breeding

Short-tailed albatross are long-lived and first breed at age five or six years, with females laying one egg each year (USFWS 2008). Nesting areas are open and treeless, with little vegetation. Most of the birds breed at the Tsubamezaki colony on Torishima Island, which is an active volcano. The two other breeding colonies are Hasunezaki (also on Torishima) and the Japanese Senkaku Islands, southwest of Torishima (USFWS 2008). Short-tailed albatross have strong site fidelity and typically return to the same breeding site year after year.

There was a translocation effort at Mukojima in the Ogasawara (Bonin) Islands from 2008 through 2012 and early accounts seem promising. Additionally, a pair of short-tailed albatross at Midway Atoll in the Northwestern Hawaiian Islands has successfully bred during three seasons. (USFWS 2014a)

6.4 Range

During the breeding season from December to April, short-tailed albatross are mainly concentrated near breeding colonies, predominantly in Japan, although they may forage hundreds of miles from the colony sites (USFWS 2008). After breeding, immature albatross demonstrate two patterns of dispersal: some move more immediately north to the western Aleutian Islands, while others remain within northern Japan and Kuril Islands coastal waters during the summer and then, later in September, up to the western Aleutian Islands (Figure 11). Females tend to spend more time off Japan and the Kuril Islands than the males, which spend more time in the Aleutian Islands and Bering Sea (Suryan et al. 2007). In the non-breeding season, short-tailed albatross primarily range along the continental shelf and slope regions of the North Pacific (Figure 11), possibly due to the presence of squid, which are an important prey species (Suryan et al. 2006, Walker et al. 2015). A predominate amount of post-breeding time is spent off Alaska, and large groups have been observed over the Bering Sea canyons, which serve to funnel water and food onto the shelf edge (Piatt et al. 2006). Short-tailed albatross are also more active during the day than night (Suryan et al. 2007, as cited in USFWS 2008).

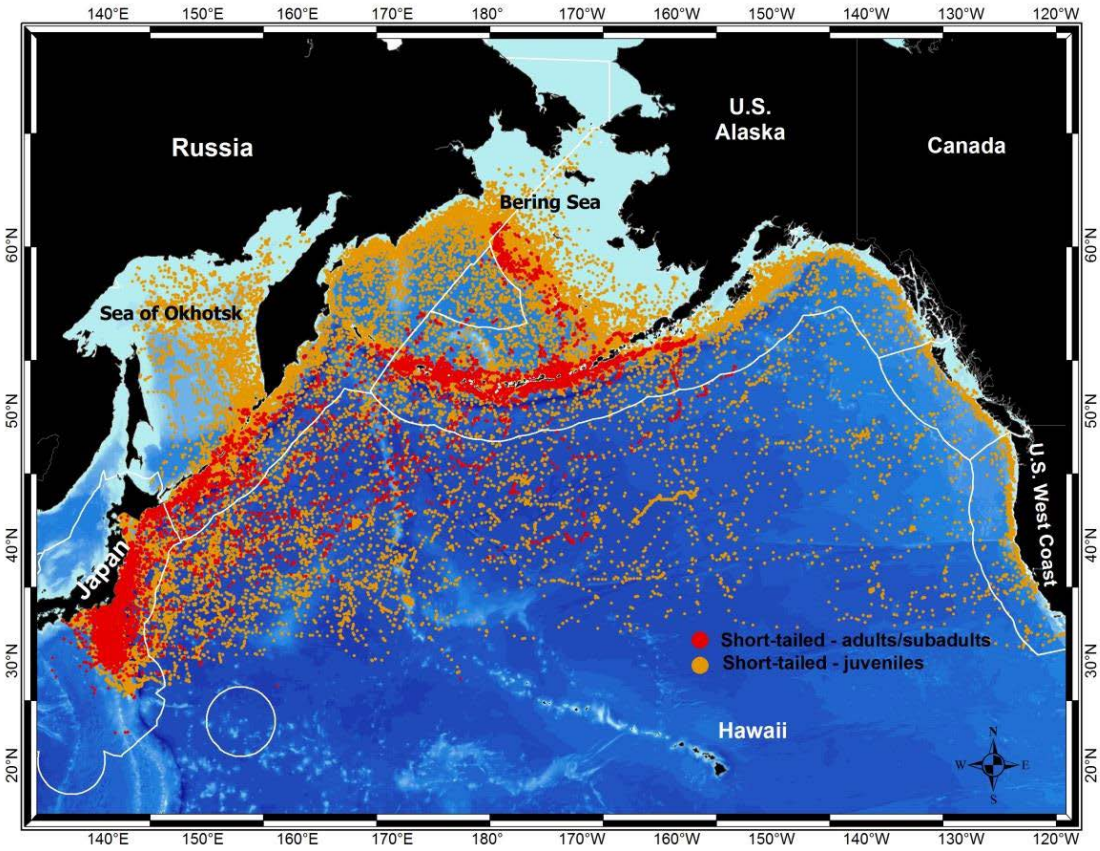

Figure 11 Short-tailed albatross locations tracked between 2002 and 2012, showing adult and juvenile distributions in the North Pacific. Where shown, white lines represent the exclusive economic zones of countries within the range of short-tailed albatross. (Figure 2 in USFWS 2014)

The short-tailed albatross' current range includes the BSAI and the GOA (Figure 11). New information regarding the current range of short-tailed albatross is discussed in detail in the most recent 5-year review by USFWS (2014a). Most short-tailed albatross in Alaska are found in the BSAI (Guy et al. 2013, as cited in USFWS 2014a). Guy et al. (2013; as cited in USFWS 2014a) reported that the U.S. west coast has a higher density of subadults than previously thought (Figure 12). A recent study provided a more complete range description by satellite tagging post-fledging juvenile birds (Deguchi et al. 2014, as cited in USFWS 2014a). That study found that adult birds did not travel as far or range as widely as younger birds, juveniles and sub-adults up to two years old (Deguchi et al. 2014, as cited in USFWS 2014a). Aleutian Island waters have recently been highlighted as important areas used for feeding during the time when the short-tailed albatross molt (USFWS 2014a). O'Connor (2013, as cited in USFWS 2014a) noted areas along the Bering Sea shelf where albatross and vessels were associated more than other areas. However, these areas did not perfectly align with recent short-tailed albatross mortalities (O'Connor 2013, as cited in USFWS 2014a).

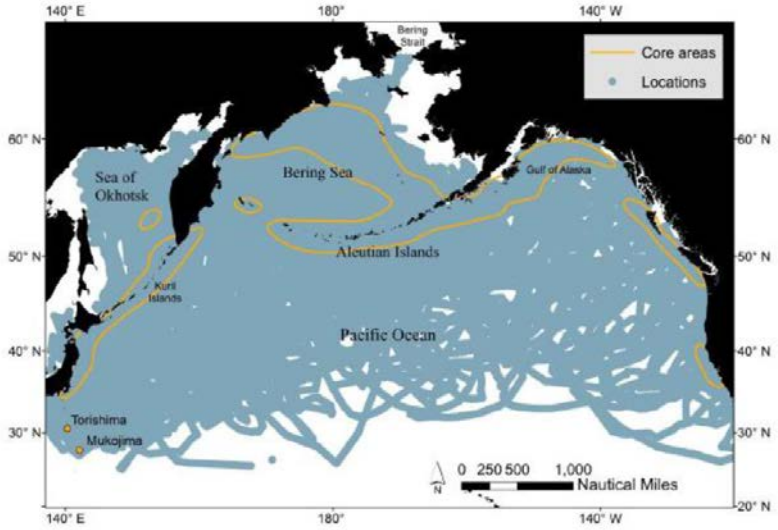

Figure 12 Core habitat (50 percent kernel) and point locations showing extent of travel for immature short-tailed albatross (O'Connor 2013, as cited in USFWS 2014a; Figure 3 in USFWS 2014a).

Kuletz et al. (2014, as cited in USFWS 2014a) determined that short-tailed albatross distribution may be changing significantly based on squid distribution. From the 1970s to the 2000s, short-tailed albatross have increased in abundance and moved their center of distribution northward in the BSAI (Kuletz et al. 2014, as cited in USFWS 2014a).

6.5 Foraging

During egg incubation and brood-rearing, short-tailed albatross forage along the eastern coastal waters of Honshu Island, Japan, with one parent incubating the nest for 2 to 3 weeks, while the other forages (USFWS 2008). After the chick has grown enough to regulate its own temperature, both parents forage and the chick stays at the nest. After hatching, chicks are fed on stomach oil, then soon more solid food such as squid and flying fish eggs. Important non-breeding season diet includes squids, crustaceans, and fishes (Hasegawa and DeGange 1982). They also utilize fishery offal and marine mammal carcasses (Hasegawa and DeGange 1982).

6.6 Recovery Criteria

The USFWS (2008) states that the short-tailed albatross may be reclassified from endangered to threatened under the following conditions:

> The total breeding population of short-tailed albatross reaches a minimum of 750 pairs; AND
>
> At least three breeding colonies each exhibiting a 3-year running average growth rate of ≥6 percent for ≥7 years, at least two of which occupy island groups other than Torishima with a minimum of ≥50 breeding pairs each.

The USFWS (2008) states that the species may be delisted under the following conditions:

> The total breeding population of short-tailed albatross reaches a minimum of 1000 pairs (population of 4000 or more birds); AND
>
> The 3-year running average growth rate of the population as a whole is ≥6 percent for ≥7 years; AND

> At least 250 breeding pairs exist on 2 island groups other than Torishima, each exhibiting ≥6 percent growth for ≥7 years; AND
> A minimum of 75 pairs occur on a site or sites other than Torishima and the Senkaku Islands.

The USFWS (2008) states that the species may be reclassified from threatened to endangered under the following conditions:

> Fewer than 750 breeding pairs exist, and the population has had a negative growth rate for at least 3 years; OR
> Breeding colonies occur on fewer than three island groups.

The current population status was recently reviewed relative to the recovery criteria by USFWS (2014a). The latest status update by USFWS (2014a) stated that:

> The short-tailed albatross is making good progress toward meeting some of the recovery criteria, but because most birds still nest on Torishima, the potential for catastrophic events devastating the main breeding colonies still puts the entire population at risk. Overall population size of 750 breeding pairs required for reclassification to threatened was estimated to have been met in 2013 and the delisting criteria of 1,000 breeding pairs is estimated to be met in 2017 (P. Sievert, pers. comm. 2010). The distribution of these breeding pairs is approximately 78 percent on Torishima and 22 percent in the Senkaku Islands. Whereas the numbers of breeding pairs on Torishima are verifiable by annual nest counts, the Senkaku Islands breeding population estimate is an unverified projection from growth of this breeding colony since 2002, the last time the site was visited. The 3-year running average (defined as the average of the present year and two previous years) growth rate for the population on Torishima meets the recovery criteria for delisting.
> The challenge to recovering the species will be the growth of the new colonies at islands other than Torishima and the Senkakus.
> [B]ased on a deterministic population model, the population in the Ogasawara (Bonin) Islands is not projected to reach the 50 breeding pairs needed for reclassification until 2046 and 75 breeding pairs required for delisting until 2052 (P. Sievert, pers. comm. 2010).
> It is possible that significant immigration of birds to the Ogasawara (Bonin) Islands from the other colonies could greatly accelerate growth, reaching the target population size before the projected date. There also have been recent breeding attempts at Kure Atoll in the northwest Hawaiian Islands, and successful breeding during three seasons by a pair at Midway Atoll in the Northwestern Hawaiian Islands (USFWS, unpubl. data). It is important to emphasize that both reclassification and delisting criteria require verified information about actual colony growth in the Senkaku Islands (Minami-kojima and Kita-kojima).

Thus delisting is not anticipated before 2052 at the earliest, assuming the colony growth rate at the Senkaku Islands is the same as that on Torishima and that the volcano on Torishima does not erupt and harm the colony there, among other things. The population model used to make these estimations about short-tailed albatross does not account for immigration and has large confidence intervals (P. Sievert, University of Massachusetts Amherst, Personal Communication, February 21, 2017). Therefore, any new information could help refine the model's parameters and resulting population projections.

6.7 Threats – Non-fishery Related[2]

The primary current threat to the short-tailed albatross is volcanic activity on the island of Torishima, the main breeding site. The last eruption was minor and occurred in 2002; there were no known short-tailed albatross mortalities (USFWS 2009). Additional current threats include erosion and monsoon rains, climate change, and ocean regime shift (USFWS 2014a). Monsoon rains can result in mud slides and erosion that can increase the chance of mortality of eggs and chicks, especially if they occur at the main colony site of Tsubamezaki (USFWS 2014a). Climate change may not affect breeding colonies through seawater rise due to high nesting elevation; however, change in weather patterns could affect the species range or the location of the prey base, and how these changes will affect the short-tailed albatross are unknown (USFWS 2008, 2014a).

Other threats include contaminants, disease and parasites, predation, natural competition, invasive species, airstrikes, other human activity, and stochastic and genetic factors (USFWS 2008).

Contaminants —

- Organochlorines, pesticides, and metals — Albatross may be exposed to organochlorine contaminants such as polychlorinated biphenyls and pesticides as well as toxic metals via atmospheric and oceanic transport. These contaminants may result in impaired reproduction, reduced immune function, inability for thermoregulation, impaired endocrine balance, genetic mutations, and direct mortality. (USFWS 2008)
- Oil — Contamination by oil can harm short-tailed albatross through acute toxicity through direct exposure or by chronic sublethal exposure to low levels. Exposure to oil can impair thermoregulation, result in poisoning through ingestion, pollute food sources, reduce prey availability, and result in embryotoxic effects. (USFWS 2008)
- Plastics — Albatross are known to accidentally consume plastics, mistaking them for food items, which can result in internal injury, or reduced gut volume for food consumption (USFWS 2008). Toxins can be released from the ingested plastics and potentially cause harm in seabirds as well (USFWS 2014a).

Disease and Parasites—

While there are no known parasites or diseases affecting short-tailed albatross today, the population is vulnerable due to its small size and limited breeding sites (USFWS 2008).

Predation —

While not a major threat, sharks may feed on fledglings when they leave the colony. Steller's sea eagles also take an occasional chick. Crows were historically predators on Torishima, but are not present today. (USFWS 2008)

Natural competition —

Although ranges of Laysan and short-tailed albatross overlap, Laysan tend to utilize the deeper waters, while short-tailed feed in shallower waters (Suryan and Fischer 2010, USFWS 2008). Black-footed albatross are not as numerous as Laysan albatross and their distribution is not strongly associated with "any particular bathymetric domain" (USFWS 2008). USFWS (2008)

[2] From recovery plan (USFWS 2008), the 2009 5-year review (USFWS 2009), and the 2014 5-year review (USFWS 2014a).

concluded that neither the Laysan nor the black-footed albatross were impacting the short-tailed albatross food supply in the North Pacific.

Invasive species —

There are no known instances of introduced rats predating on eggs or preying on chicks, nor of introduced plants impacting nesting habitat (USFWS 2008).

Air strikes —

There is a small risk of short-tailed albatross hitting aircraft on the Midway Atoll, but the risk is small and discountable (USFWS 2008).

Other human activities —

While human hunting and egging were responsible for drastic reductions in populations, these are no longer occurring, and the unintentional take through human interaction, such as by researchers, is not considered a significant threat (USFWS 2008).

Stochastic and genetic factors —

Small populations can lack the genetic variation necessary to overcome random or catastrophic events and still recover. The recovery plan (USFWS 2008) states that the projected increasing population numbers of short-tailed albatross increase the probability that the world population of short-tailed albatross could suffer significant loss and survive. However, this is only true if mortality rates do not increase more than 5 to 7 percent (USFWS 2008).

6.8 Threats – Fishery Related[3]

6.8.1 Commercial Fishing by Non-U.S. Fishing Fleets

Most fisheries are not required to report seabird incidental catch. Fisherman may not be able to identify seabirds, or there may be disincentives for reporting seabird take. There are few reports of short-tailed albatross taken outside of the U.S. EEZ (USFWS 2008; see Table 5 below).

In preparing this biological assessment, we are aware of additional international conservation and bycatch mitigation measures related to short-tailed albatross; these are summarized on the NMFS International Seabird Conservation Web site[4]. NMFS works to mitigate the incidental catch of seabirds in fisheries by working closely with many domestic and international partners. NMFS works internationally through regional fishery management organizations[5] and with countries that have vessels overlapping with seabird distribution to promote seabird conservation. Although not a member, the U.S. actively participates in the Agreement on the Conservation of Albatrosses and Petrels,[6] the only multilateral agreement that coordinates international activity to mitigate threats to albatross and petrel populations. These programs and their conservation measures change frequently and do not directly affect the actions examined in this biological assessment.

[3] From recovery plan (USFWS 2008), the 2009 5-year review (USFWS 2009), and the 2014 5-year review (USFWS 2014a).

[4] http://www.nmfs.noaa.gov/ia/species/seabirds/seabirds.html

[5] http://www.nmfs.noaa.gov/ia/agreements/regional_agreements/intlagree.html

[6] http://www.acap.aq/index.php/en

Japan

Limited bycatch data are available for fisheries in Japan. Hook-and-line fishing for tuna is the only likely threat according to the Japanese fishery agency, and no bycatch of albatross have been reported (USFWS 2008). Japan has implemented several management measures for fishermen to choose from to prevent seabird bycatch (USFWS 2014a). Japan also implemented an observer program for hook-and-line (started 2008) and purse seine (started 2011) fisheries (Uosaki et al. 2013, 2014, as cited in USFWS 2014a). One short-tailed albatross take was reported during bycatch mitigation research in Japan in 2013 (Table 5). USFWS (2014a) notes that:

> The continuing research by Japan and their research partners has been an important contribution to minimizing hook-and-line fisheries bycatch of short-tailed albatrosses and reduces threats to the species if the improved techniques are implemented.

Russia

There are four reports of a short-tailed albatross take in Russian fisheries; two in the western Bering Sea (1998 and 2003), one in the Sea of Okhotsk (2002), and one in the Kuril Islands (2006). Russian cod fisheries using hook-and-line gear experimented with streamer lines to deter seabirds and found that paired streamers were the most effective. Wide-spread use of the streamer lines has not been consistent but efforts to increase use persist. (USFWS 2014a)

Canada

USFWS (2014a) notes that:

> Off Canada's west coast, the deployment of seabird avoidance gear (e.g., streamers, weighted groundlines, thawed bait, etc.) has been a mandatory requirement for fishing licenses for all hook and line groundfish fisheries since 2002–2005 (depending on the fishery). Most bycatch monitoring in these fisheries is now done by on-board Electronic Monitoring Systems (EMS). Following each fishing trip, approximately 10 percent of the EMS video imagery is audited. Although there have been no EMS (or other) reports of short-tailed albatross bycatch in the groundfish fisheries, the incidental take of black-footed albatrosses (plus unidentified albatrosses) in the longline fisheries (for 2006–2009) was estimated to be approximately 85 birds per year (range 25–128, Fisheries and Oceans Canada 2012).

A large proportion of albatrosses caught are either classified as "not identified" or not identified to species in the EMS audit data, and thus USFWS (2014a) surmised that one or two short-tailed albatross are killed each year in Canadian west coast groundfish hook-and-line fisheries. (K. Morgan, Canadian Wildlife Service, Personal Communication, 2014, as cited in USFWS 2014a).

Drift-net Fishing in North Pacific

USFWS (2014a) states that:

> United Nations General Assembly (UNGA) Resolutions 44/225, 45/197, and 46/215 (United Nations 1989, 1990, 1991) called for a global driftnet moratorium on the high seas by June 30, 1992, and the UNGA has adopted the resolution biennially. NMFS and the State Department work to implement the moratorium for the U.S. According to NMFS (2013), however high seas driftnet fishing continues to exist in the North Pacific Ocean. The fishing effort targets species of squid and occurs toward the end of the fishing season, both of which pose a greater threat to short-tailed albatrosses. While the numbers of sightings and apprehensions of vessels driftnetting in the North Pacific high seas appear to be decreasing (Table 5), non-compliance with the moratorium continues

to pose a risk of mortality to short-tailed albatrosses that could be entangled in the nets. International efforts are continuing to enforce the moratorium (NMFS 2013), but driftnet fisheries will continue to pose threats to albatrosses.

No takes of short-tailed albatross were recorded during the three years observers were deployed to this fishery, prior to the ban (S. Fitzgerald, NMFS AFSC, July 2015, Personal Communication).

6.8.2 Commercial Fishing by U.S. Fisheries

Since the March 1998 biological opinion (USFWS 1998), nine short-tailed albatross mortalities associated with U.S. commercial fisheries have been observed and reported: eight in the North Pacific cod fishery (managed by NMFS's Alaska Region) and one in the Pacific Coast groundfish fishery (managed by NMFS's West Coast Region) (Table 5). The reported level of mortality is below the estimated level of individuals (four short-tailed albatross in a 2-year period) that would trigger management concerns.

Pacific U.S. West Coast

West Coast Pacific halibut fisheries are managed by the IPHC, in common with the rest of the Pacific halibut stock; however, the Pacific Fishery Management Council also maintains a catch sharing plan governing the allocation of halibut and sport fisheries management (82 FR 18581, April 20, 2017). The Area 2A (U.S. West Coast) catch sharing plan and its implementing regulations are available on the NMFS West Coast Region's Web site.[7]

A short-tailed albatross was taken off the U.S. West Coast in 2011 by the sablefish demersal longline fishery managed by NMFS's West Coast Region. NMFS implemented seabird bycatch mitigation measures for the West Coast groundfish fishery in November 2015 (80 FR 71975). The seabird avoidance program requires groundfish fishing vessels 55 ft LOA or greater using bottom hook-and-line gear to deploy bird-scaring streamer lines with their longline gear, similar to Alaska groundfish fishery regulations (50 CFR 679.24(e)).

Under the ongoing formal ESA consultation between NMFS and USFWS, the USFWS updated its biological opinion in 2017 to maintain its conclusion that the Pacific Coast Groundfish FMP would not jeopardize the continued existence of short-tailed albatross (USFWS 2017). The biological opinion anticipates take of no more than one short-tailed albatross in 2 years, or an average estimated take of no more than five birds per 2-year period, as a result of the continuing operation of the groundfish fisheries (USFWS 2017). Under the biological opinion's reasonable and prudent measures necessary and appropriate to minimize take of short-tailed albatross, the West Coast Region anticipates considering additional regulatory actions to require streamer lines for hook-and-line vessels shorter than 55 ft LOA, and to require bycatch mitigation measures in the groundfish trawl fishery (USFWS 2017).

Hawaii

As the result of formal ESA consultation between NMFS and USFWS, USFWS released a biological opinion in 2012 (USFWS 2012) concluding that the operation of Hawaii-based fisheries using pelagic hook-and-line gear would not jeopardize the continued existence of short-tailed albatross. The estimated mortality anticipated from the fishery was three individuals over a 5-year period, one from the shallow set fishery and two from the deep set fishery (USFWS 2012).

[7] http://www.westcoast.fisheries.noaa.gov/fisheries/management/pacific_halibut_management.html

North Pacific U.S. Coast off Alaska

Short-tailed albatross mortalities have occurred in the Alaska groundfish fishery summarized in Table 5; the most recent takes in the Alaska groundfish fisheries are shown in Figure 13.

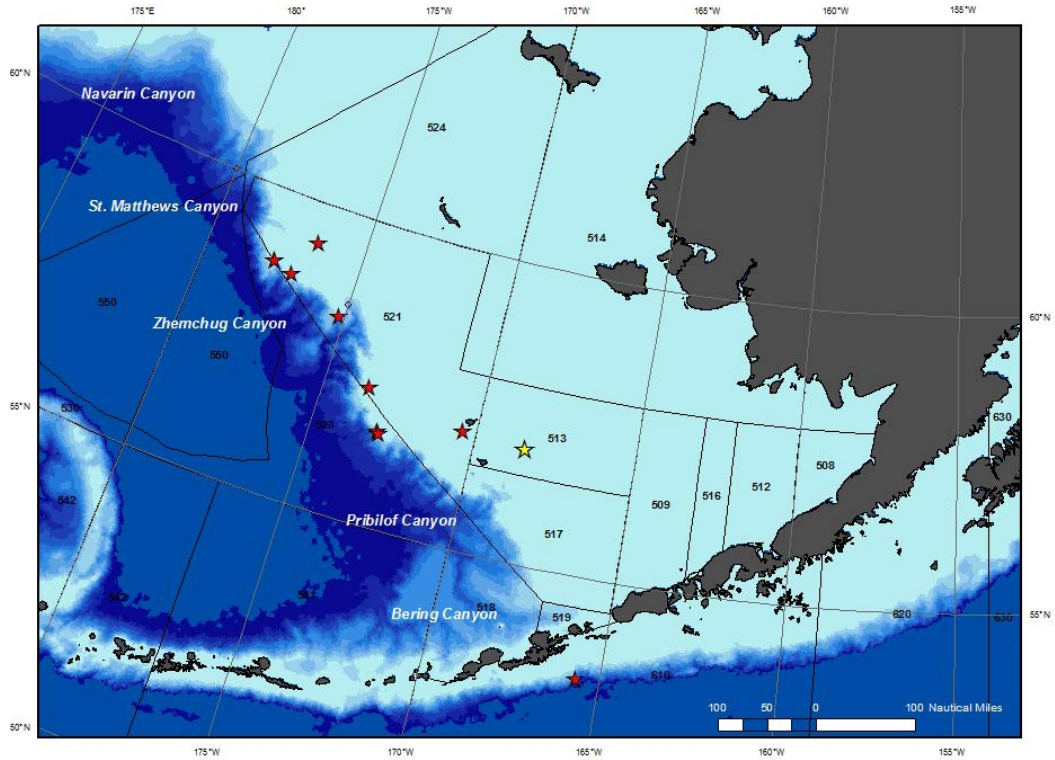

Figure 13 Observed locations of short-tailed albatross takes in Alaska groundfish fisheries since 1995 (red stars). Two takes, in September 2014, occurred in the same location and are represented by one star. Latest confirmed take on December 16, 2014, is shown by the yellow star. (NMFS 2015c)

The USFWS recently consulted with NMFS Alaska Region under section 7 of the ESA on the effects of the groundfish fisheries on the endangered short-tailed albatross. In its 2015 biological opinion, the USFWS determined the groundfish fisheries off Alaska are likely to adversely affect short-tailed albatross, but they are not likely to jeopardize its continued existence (USFWS 2015). This biological opinion included an incidental take limit of six short-tailed albatross every two years in the groundfish fisheries off Alaska, either by hook-and-line gear or trawl gear.

For over 26 years, NMFS has formally consulted with the USFWS regarding the short-tailed albatross, and to date none of the incidental take limits have been reached within the specified periods. Since 1993, NMFS and the USFWS have coordinated their response to these takes to comply to the fullest extent with ESA requirements to protect and recover this species. Additional information regarding the effects of the groundfish fisheries on the endangered short-tailed albatross can be found in the 2015 biological opinion (USFWS 2015).

There has been one recorded take of short-tailed albatross in the commercial halibut fishery in U.S. Convention waters off Alaska in the GOA in October 1987.

Effects of the commercial, subsistence, and sport halibut fisheries in U.S. Convention waters off Alaska on short-tailed albatross are evaluated in this biological assessment and discussed in Sections 6.8.3, 6.9.2, and 6.9.3, respectively.

Table 5 Reported short-tailed albatross mortalities associated with Pacific fishing activities since 1983. Data from Table 9, NMFS (2015a).

Date	Fishery	Observer Program	In sample*	Bird age	Location	Source
7/15/1983	Net	No	n/a	4 months	Bering Sea	USFWS (2014a)
10/1/1987	Halibut	No	n/a	6 months	Gulf of Alaska	USFWS (2014a)
8/28/1995	IFQ sablefish	Yes	No	1 year	Aleutian Islands	USFWS (2014a)
10/8/1995	IFQ sablefish	Yes	No	3 years	Bering Sea	USFWS (2014a)
9/27/1996	Hook-and-line CP targeting Pacific cod	Yes	Yes	5 years	Bering Sea	USFWS (2014a)
4/23/1998	Russian salmon drift net	n/a	n/a	Hatch-year	Bering Sea, Russia	USFWS (2014a)
9/21/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	8 years	Bering Sea	USFWS (2014a)
9/28/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	Sub-adult	Bering Sea	USFWS (2014a)
7/11/2002	Russian**	n/a	n/a	3 months	Sea of Okhotsk, Russia	USFWS (2014a)
8/29/2003	Russian demersal hook-and-line	n/a	n/a	3 years	Bering Sea, Russia	USFWS (2014a)
8/31/2006	Russian**	n/a	n/a	1 year	Kuril Islands, Russia	USFWS (2014a)
8/27/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	7 years	Bering Sea/Aleutian Islands	USFWS (2014a)
9/14/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	3 years	Bering Sea/Aleutian Islands	USFWS (2014a)
4/11/2011	Sablefish demersal hook-and-line	Yes	Yes	1 year	Pacific Ocean, Oregon	USFWS (2014a)
10/25/2011	Hook-and-line CP targeting Pacific cod	Yes	Yes	1 year	Bering Sea	USFWS (2014a)
5/24/2013	Hook-and-line, seabird bycatch mitigation research	No	n/a	1 year	Pacific Ocean, Japan	USFWS (2014a)
9/7/2014***	Hook-and-line CP targeting Pacific cod	Yes	No	5 years	Bering Sea	NMFS (2014b); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication
9/7/2014***	Hook-and-line CP targeting Pacific cod	Yes	Yes	Sub-adult	Bering Sea	NMFS (2014a); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication
12/16/14***	Hook-and-line CP targeting Pacific cod	Yes	Yes	Immature	Bering Sea	NMFS (2015c); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication

CP = catcher/processor

*"In sample" refers to whether a specimen was in a sample of catch analyzed by a fisheries observer

**Specifics regarding the type of fishery are unknown

***This data was not included in USFWS (2014a)

6.8.3 Commercial (IFQ and CDQ) Pacific Halibut Fishery in U.S. Convention waters off Alaska

The commercial fishery description (discussed in Section 4.0) set the context for assessing direct and indirect effects. Of primary concern are those attributes of the fishery that influence the exposure of listed species to the fishery and potential outcomes, including gear type, geographic extent, and seasonality. Short-tailed albatross visit and follow commercial fishing vessels in Alaska that target sablefish, Pacific cod, Pacific halibut, and pollock (USFWS 2008). Within Alaska, albatross have been documented to spend varying amounts of time among NMFS reporting zones, with six of the reporting zones in the Eastern Bering Sea having the most frequently observed use (521,524,541, 542, 543, and 610) (Suryan et al. 2007). These areas roughly overlap with IPHC Regulatory Areas 3B, 4A, and 4B (Figure 4).

This section includes a description of the effort of the commercial Pacific halibut fishery in U.S. Convention waters off Alaska (in terms of overall effort by gear type, location, and season) that may interact with ESA-listed species and their critical habitat. Two metrics are used to describe effort: amount of halibut harvested (weight) and the number of hooks used (for hook-and-line gear only). It is important to discuss when and where the gear is deployed as well as the amount of fishing effort (in terms of the weight of the fish harvested as well as hooks fished, if applicable) for comparison with the distribution of listed species.

Gear

In U.S. Convention waters off Alaska, most commercial halibut fishing vessels use hook-and-line gear, followed by troll and mechanical jig gear (Table 6). The number of vessels fishing for halibut in U.S. Convention waters off Alaska decreased from 2009 through 2016 for all gear types. This is due to a reduction in the halibut population and subsequent reductions in the halibut total allowable catch (TAC) (Figure 16).

Table 6 Vessel counts unique to each gear type. The number of vessels that exclusively use a particular gear type are shown with the number of vessels that use that gear type in addition to another gear type are shown in parentheses. Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
Hook-and-line	1,123 (1,192)	1,088 (1,161)	1,101 (1,154)	1,049 (1,112)	994 (1,034)	923 (963)	859 (887)	842 (879)
Troll	99 (169)	107 (177)	113 (167)	95 (154)	102 (144)	27 (63)	27 (52)	25 (55)
Jig	21 (24)	15 (20)	17 (24)	19 (23)	22 (23)	2 (6)	3 (6)	4 (11)

When these data are split by region, either the BSAI or GOA, it is evident that most of the vessels are fishing for halibut in the GOA (Table 7). No troll or mechanical jig gear was used to fish for halibut in the BSAI in 2015 or 2016. The same trends seen in Table 6 (the combined data) are seen here as well. Most vessels are commercial fishing for halibut using hook-and-line gear, followed by troll and mechanical jig, and the number of vessels using each gear type have decreased from 2009 through 2016. (Table 7).

Table 7 Unique vessel counts by area (BSAI or GOA) and gear type. The "All" gear category provides the number of unique vessels in the area (BSAI or GOA). Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
BSAI								
All	319	307	339	312	314	157	130	128
Hook and Line	244	228	247	240	221	154	130	128
Mechanical Jig	20	15	21	15	21	0	0	0
Troll	75	78	84	64	78	4	0	0
GOA								
All	1,067	1,054	1,028	983	904	893	847	840
Hook and Line	1,020	1,010	986	941	873	867	817	811
Mechanical Jig	4	5	3	8	2	6	6	11
Troll	94	99	83	90	63	59	52	55

Short-tailed albatross have been shown to be impacted by fisheries employing hook and line gear. There are no reported takes of seabirds by jig or troll gear in the halibut fisheries off Alaska.

Location

Using IPHC data from logbooks (as described in Section 4.2.7), it is evident that throughout the entire fishing year most vessels are fishing in the GOA and Southeast Alaska in IPHC Regulatory Areas 2C and 3A where the number of vessels is greatest from March through May, then decreases in June through August and again in September through November (Figure 14). In Areas 3B, 4A, 4B, and 4CDE, the greatest number of vessels occurs from June through August (Figure 14).

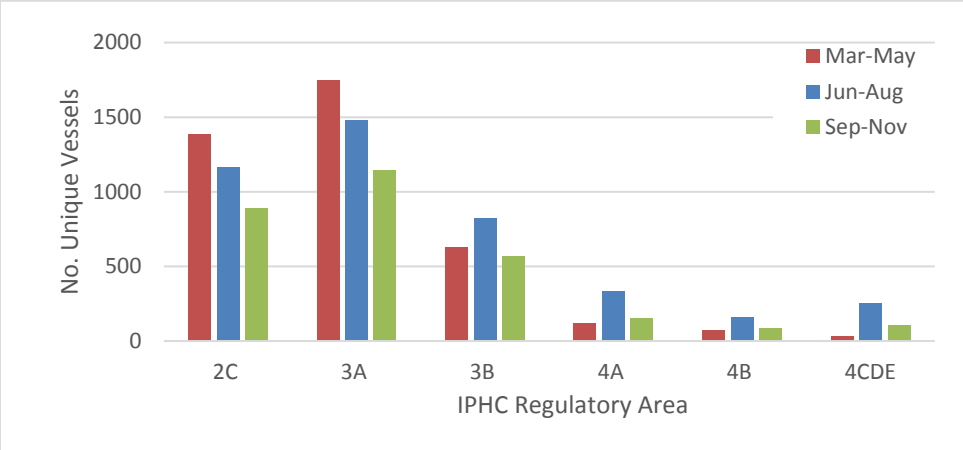

Figure 14 Number of unique vessels by IPHC regulatory area and month group from 2009 through 2015. Data available in Table 15. Source: IPHC logbook data described in Section 4.2.7.

Using IPHC data from fish tickets (as described in Section 4.2.7), which is a more complete picture, it is evident that most vessels (approximately 2,000 vessels) are fishing for halibut in Areas 2C and 3A, especially from March through August (Figure 15). A large number of vessels (1,387 vessels) are also in Areas 4CDE from June through August (Figure 15; Table 16).

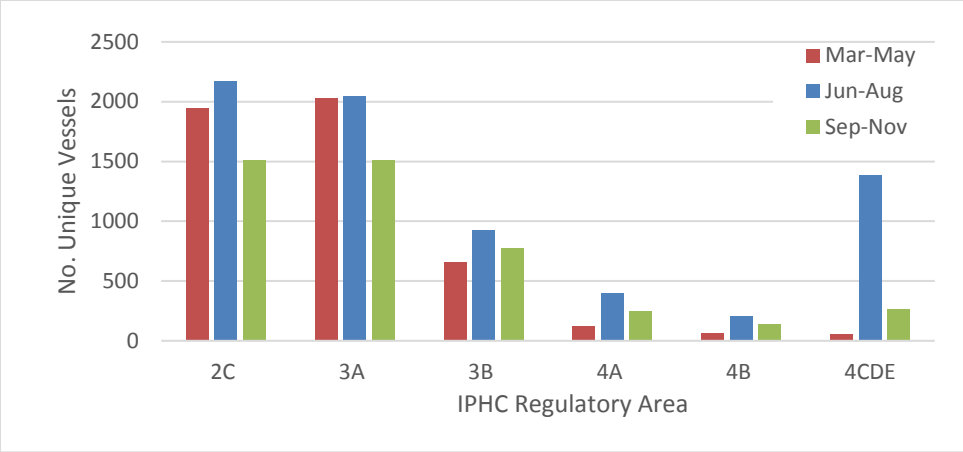

Figure 15 Number of unique vessels by IPHC regulatory area and month group from 2009 through 2015. Data available in Table 16. Source: IPHC fish ticket data described in Section 4.2.7.

Vessel Size

Vessel size by area in the halibut fleet in U.S. Convention waters off Alaska was examined using NMFS Alaska RAM data (Table 8). Most halibut vessels are greater than 26 ft to less than or equal to 55 ft LOA.

Table 8 Unique vessel counts for halibut vessels by area and vessel length 2009 through 2016. Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
BSAI and GOA								
≤ 26ft LOA	570	555	586	535	568	292	207	216
>26 to ≤ 55ft LOA	1,610	1,588	1,542	1,505	1,344	1,320	1,241	1,228
> 55ft LOA	519	499	505	475	444	412	414	409
BSAI								
≤ 26ft LOA	363	338	381	328	372	95	50	46
>26 to ≤ 55ft LOA	171	172	188	189	156	138	114	118
> 55ft LOA	124	118	122	114	106	82	96	92
GOA								
≤ 26ft LOA	207	217	205	209	198	199	159	172
>26 to ≤ 55ft LOA	1,477	1,470	1,416	1,362	1,226	1,226	1,167	1,144
> 55ft LOA	501	481	479	451	418	400	396	401

Gear type by vessel size was examined in the halibut fleet in U.S. Convention waters off Alaska using NMFS Alaska RAM data (Table 9). Most halibut vessels in all size categories used hook-and-line gear.

Table 9 Unique vessel counts for halibut vessels by gear and vessel length 2009 through 2016. The "All" gear category provides the number of unique vessels in the vessel length category. Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
≤ 26ft LOA								
All	552	538	574	529	561	289	207	215
Hook and Line	390	386	386	385	379	283	205	211
Mechanical Jig	42	26	38	30	40	0	0	0
Troll	156	160	174	128	158	14	4	8
>26 to ≤ 55ft LOA								
All	1,577	1,559	1,529	1,473	1,333	1,308	1,234	1,211
Hook and Line	1,495	1,465	1,451	1,389	1,267	1,258	1,178	1,157
Mechanical Jig	6	14	10	14	6	6	10	20
Troll	180	192	156	180	120	112	100	102
> 55ft LOA								
All	571	548	552	519	482	445	453	450
Hook and Line	571	548	550	519	482	443	451	450
Mechanical Jig	0	0	0	2	0	6	2	2
Troll	2	2	4	0	4	0	0	0

Amount of Halibut Harvested

The Pacific halibut fishery has been managed by IPHC since 1923. Catch limits for each of the IPHC regulatory areas are set each year by the six IPHC Commissioners from the U.S. and Canada. The U.S. and Canada halibut population (measured in spawning biomass) decreased dramatically from 1997 to 2011 and has remained relatively consistent since then (Stewart and Hicks [2016]; data available in Table 18). Subsequently, the IPHC Commissioners have adjusted the halibut TAC; halibut TAC from 2009 through 2017 is shown in Figure 16.

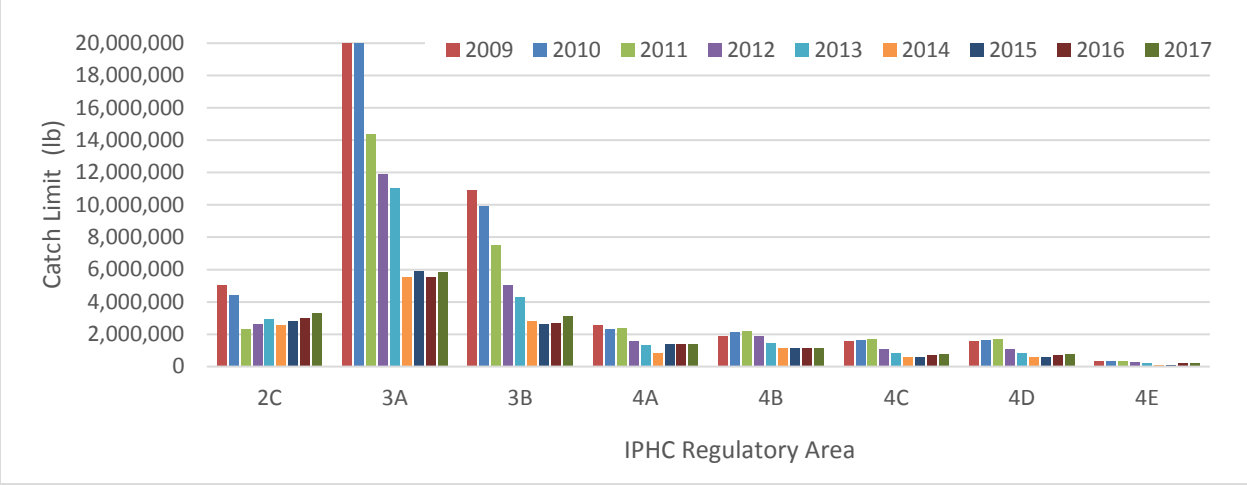

Figure 16 Halibut TAC from 2009 through 2017. Data available in Table 17. Commercial catch limit data from IPHC annual reports, available at: http://www.iphc.washington.edu/library/regulations.html.

From 2009 through 2016, 99.7 percent of the commercially caught halibut off Alaska (GOA and BSAI) was harvested using hook-and-line gear, 0.17 percent was harvested using troll gear, and 0.03 percent

was harvested using mechanical jig gear (Table 10). Halibut harvest by all gear types decreased by over 50 percent from 2009 through 2016 (Table 10). This is due to a reduction in the halibut population (Stewart and Hicks [2016]; data available in Table 18) and subsequent reductions in the halibut TAC (Figure 16).

Table 10 Sum of halibut net weight using each gear (all areas off Alaska combined). Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
Hook and Line	44,053,658	41,734,811	31,571,285	24,712,384	21,856,309	16,539,437	17,396,003	17,589,394
Mechanical Jig	10,026	14,768	11,589	10,130	10,456	4,030	10,242	4,194
Troll	67,461	97,576	74,502	51,945	41,327	16,440	12,381	12,408
Grand Total	**44,131,145**	**41,847,155**	**31,657,376**	**24,774,459**	**21,908,092**	**16,559,907**	**17,418,626**	**17,605,996**

From 2009 through 2016, 82 percent of the halibut harvested (using either hook-and-line, troll, or jig gear) off Alaska was harvested in the GOA, 12 percent was harvested in the Bering Sea, and 6 percent was harvested in the Aleutian Islands (Table 11).

Table 11 Halibut harvest (net weight) by location (Bering Sea [BS], Aleutian Islands [AI], and Gulf of Alaska [GOA]) and combined. Source: NMFS Alaska RAM data described in Section 4.2.7.

	2009	2010	2011	2012	2013	2014	2015	2016
AI	1,866,512	2,080,558	2,332,055	2,009,374	1,332,800	1,167,893	1,202,277	1,149,554
BS	4,769,196	4,666,475	4,741,462	3,117,682	2,442,089	1,729,412	1,852,783	2,116,141
GOA	37,495,437	35,100,122	24,583,859	19,647,403	18,133,203	13,662,602	14,363,566	14,340,301
Grand Total	**44,131,145**	**41,847,155**	**31,657,376**	**24,774,459**	**21,908,092**	**16,559,907**	**17,418,626**	**17,605,996**

Looking at seasonal trends, IPHC logbook data from 2009 through 2015 show that most halibut were caught in IPHC Regulatory Area 3A from March through May (Figure 17). Overall, most of the harvest occurred in Areas 3A and 3B throughout the fishing year from March through November (Figure 17).

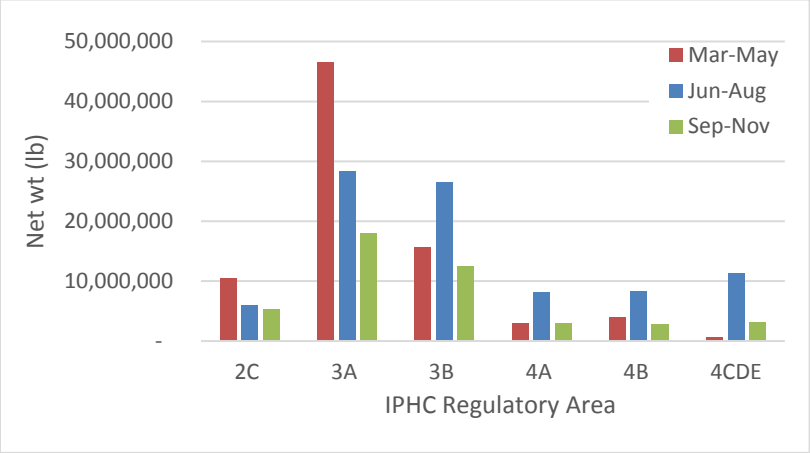

Figure 17 Commercial catch of Pacific halibut (net wt [lb]) and relative effort by IPHC regulatory area and month group from 2009 through 2015. Source: IPHC logbook data described in Section 4.2.7.

6.9 Direct Effects of the Halibut Fisheries in U.S. Convention waters off Alaska

6.9.1 Commercial (IFQ and CDQ) Pacific Halibut Fishery in U.S. Convention waters off Alaska

Figures below show the location of effort for the halibut IFQ fishery (Figure 18, Figure 19). Most of these vessels are in the partial observer coverage category (as described in Section 4.2.6). The current range of short-tailed albatross includes the BSAI and the GOA although most short-tailed albatross in Alaska are found in the BSAI (primarily IPHC Regulatory Areas 4A, 4B, and 4CDE) (Section 6.4; Figure 10). During the breeding season from December to April, short-tailed albatross are mainly concentrated near breeding colonies, predominantly in Japan, although they may forage hundreds of miles from the colony sites (USFWS 2008). Immature birds are known to move to the western Aleutian Islands (IPHC Regulatory Areas 4A and 4B) after the breeding season (some move in March while others wait until September) (Section 5.4). The Aleutian Islands (IPHC Regulatory Areas 3B, 4A, and 4B) waters are important feeding areas for short-tailed albatross during molt.

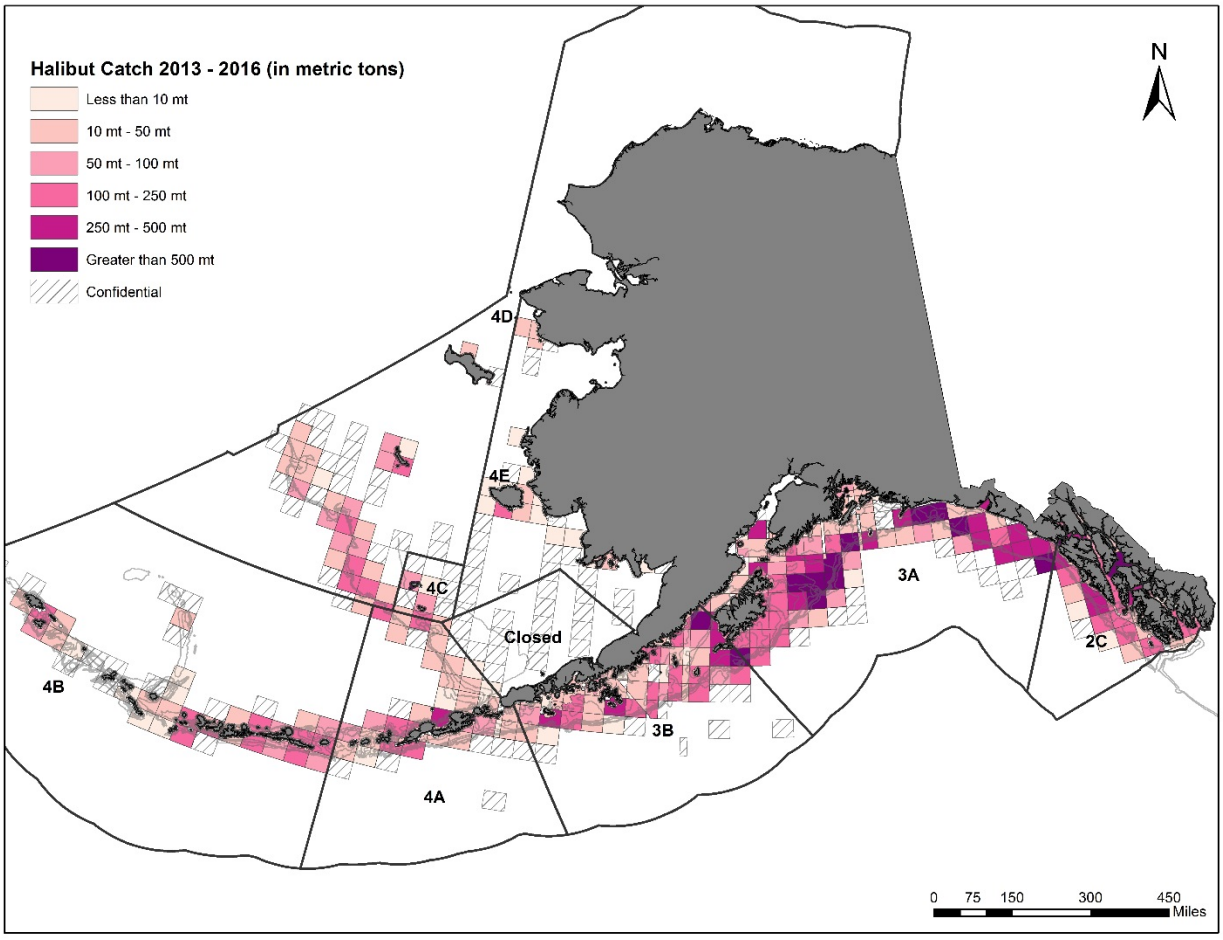

Figure 18 Commercial halibut catch in each IPHC regulatory area.

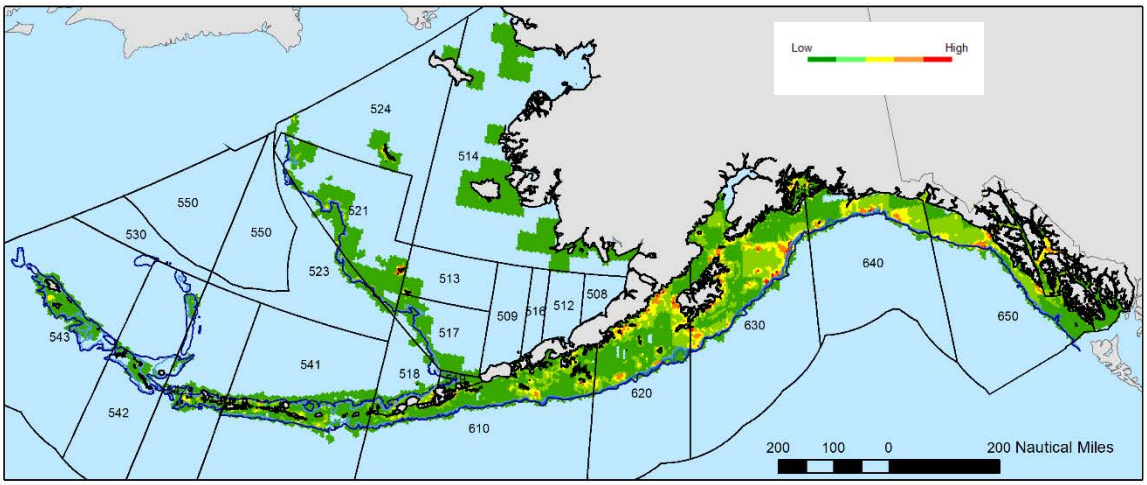

Figure 19 Average annual targeted harvest of the commercial Pacific halibut fishery using hook-and-line gear, 2011 through 2015. Colors represent volume of catch from the NMFS Alaska Region Catch-in-Areas database. Bathymetry is depicted by blue lines that darken color with deeper depths. Figure 16 from Eich et al. (2016).

During the short-tailed albatross non-breeding season (May through November), some short-tailed albatross spend time in Alaska waters, predominantly along the continental shelf (Section 6.4). Large groups of short-tailed albatross have been seen over the Bering Sea canyons (primarily IPHC Regulatory Areas 4CDE). Short-tailed albatross distribution may change significantly over time based on squid (an important prey species) distribution; the center of short-tailed albatross distribution moved northward in the BSAI from the 1970s to the 2000s (Kuletz et al. 2014, as cited in USFWS 2014a). From 2011 through 2015, squid distribution in the BSAI occurred in the Bering Canyon region of the southeastern Bering Sea and was concentrated in the southeastern portion of NMFS Area 517 and Area 519.[8]

Although commercial halibut fishery interactions with short-tailed albatross, especially juveniles, could occur at any time in areas of overlap, these data suggest that the greatest chance of interaction between the fishing vessels and short-tailed albatross adults is in IPHC Regulatory Areas 3A and 3B from May through August. This overlap occurs during the short-tailed albatross non-breeding season, May through November, and the period of highest halibut harvest (by weight). However, most of the short-tailed albatross mortalities associated with the BSAI and GOA groundfish fisheries off Alaska have been juveniles taken between September and October (Table 5), which is the end of the halibut fishing year, when the least amount of catch is harvested (Figure 17).

Hook-and-Line Gear - Hooks

The hook-and-line fleet is almost exclusively composed of CVs with a few CPs. Commercial fishing for Pacific halibut using hook-and-line gear primarily occurs in the central GOA (Figure 18). At-sea sightings and satellite-tracking data indicate that short-tailed albatross most often frequent continental shelf break and slope regions in the North Pacific.

Birds are attracted to baited hooks and discarded fish offal that result from fishing activities using hook-and-line gear. Species that are important in the short-tailed albatross' non-breeding season diet

[8] Figure 3-7 through Figure 3-11 in NPFMC (2017b); http://npfmc.legistar.com/gateway.aspx?M=F&ID=b73807e0-8fe0-41bf-9cd2-a4bcb7acc23e.pdf

includes squids, crustaceans, and fishes (Hasegawa and DeGange 1982; Walker et al. 2015). Most foraging by seabirds is for offal and bait that has come off hooks; however, baited hooks are attractive to seabirds until the weighted groundline and hooks sink far enough below the surface to no longer be available to birds (Melvin et al. 2001, Melvin and Wainstein 2006, Stehn et al. 2001). Bait for halibut can include live squid or octopus, mackerel heads or guts, any parts of cod, salmon heads and bellies, and herring. Seabirds, including albatross, attack baited hooks of both pelagic and demersal hook-and-line gear after the hooks are deployed. If birds are hooked or snagged, they can be pulled underwater with the rest of the gear and drown (USFWS 2008).

While weight of landed commercial halibut catch is used for managing the fishery quotas and for estimation of bycatch, seabird bycatch rates are best described based on hook counts (birds per 1,000 hooks is the commonly accepted international standard). However, the Alaska CAS does not currently estimate hook counts; therefore, annual extrapolations to total estimated seabird bycatch uses landed catch as a valid unit. The between-year seabird bycatch is best explained based on total effort as measured by hooks set; for the purpose of estimating total hooks fished, the IPHC logbook data are used (methods are described in Section 4.2.7). The AFSC is currently exploring alternative methods to provide estimates of total hooks fished and bycatch rates based on hooks for the entire groundfish and halibut fisheries.

Most of the hooks are deployed in IPHC Regulatory Area 3A, followed by Area 3B (Figure 20). Overall the number of hooks in Areas 3A and 3B have decreased from 2009 through 2015 whereas the number of hooks has remained relatively consistent in Areas 2C, 4A, 4B, and 4CDE (Figure 20). Areas 3A and 3B, where the most effort is seen, the reduction in the halibut population (Stewart and Hicks [2016]; data available in Table 18) and subsequent reductions in the halibut TAC (Figure 16) have made commercial halibut fishing less profitable because fishermen have less IFQ to harvest per trip. This makes each trip more costly.

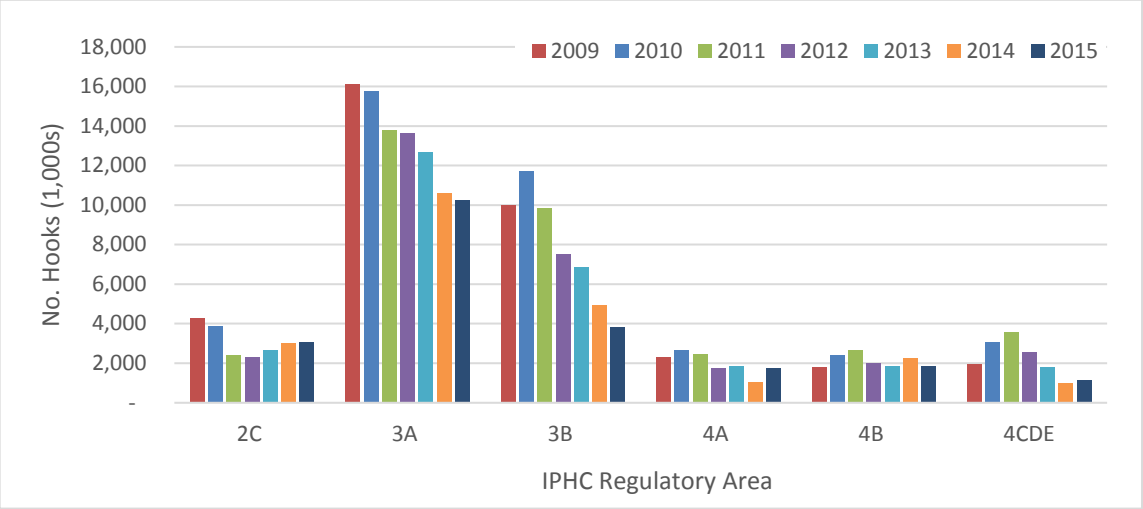

Figure 20 Number of hooks used by the Pacific halibut hook-and-line vessels and relative effort by IPHC regulatory area and year from 2009 through 2015. Source: IPHC logbook data described in Section 4.2.7.

Most hooks are seen in Areas 3A during March through May, followed by June through August in Areas 3A and 3B (Figure 21). However, the most hooks deployed overall are from June through August (Figure 21) which corresponds to when most halibut are caught (Figure 17).

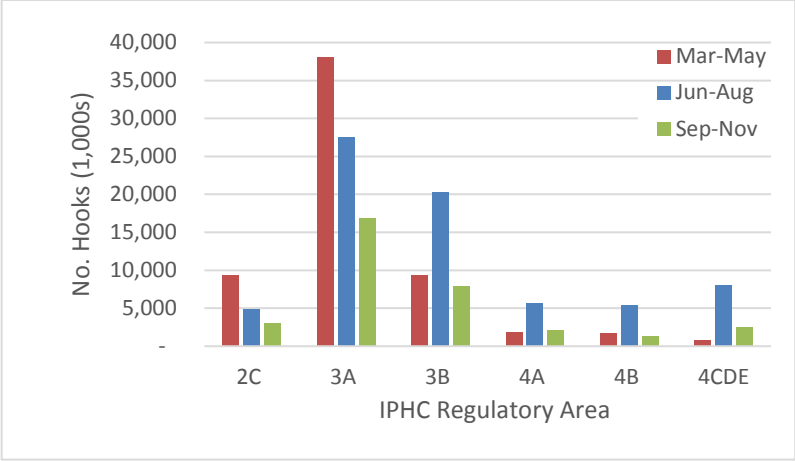

Figure 21 Number of hooks used by the Pacific halibut hook-and-line vessels and relative effort by IPHC regulatory area and month category from 2009 through 2015, combined. Source: IPHC logbook data described in Section 4.2.7.

Hook-and-line Seabird Bycatch

To reduce the incidental take of seabirds, including the short-tailed albatross, NMFS requires the vessels using hook-and-line gear in the commercial halibut fishery to employ bird avoidance techniques such as using buoy or streamer lines with performance standards specified in regulations (50 CFR 679.24) and described in Section 4.2.8 (Figure 22).

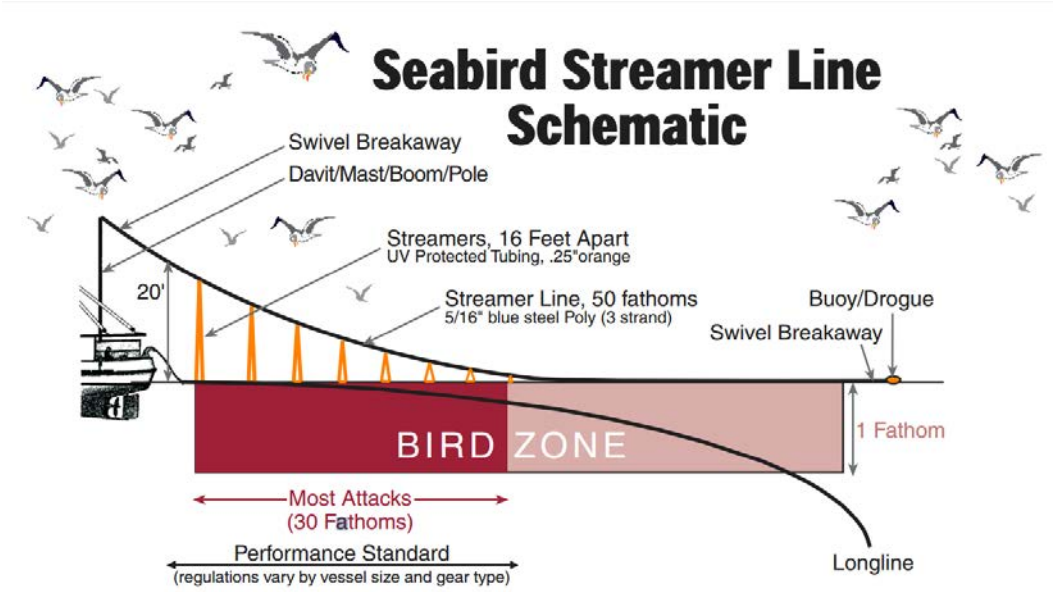

Figure 22 Streamer lines used to reduce seabird bycatch in fisheries using hook-and-line gear (Melvin 2000).

Streamer lines were one of the options for mandatory avoidance measures in 1997 (62 FR 23176, April 29, 1997). Melvin et al. (2001) reported seabird bycatch could be reduced by as much as 88 to 100 percent in Alaska fisheries using hook-and-line gear with the use of paired streamer lines. Many fishermen voluntarily adopted the use of streamer lines in 2002. Regulations for groundfish and halibut vessels using hook-and-line gear off Alaska were revised in 2004 to require the use of streamer lines with standards of proven effectiveness (69 FR 1930, January 13, 2004). The dramatic effect of streamer lines on seabird bycatch can be seen in Figure 23.

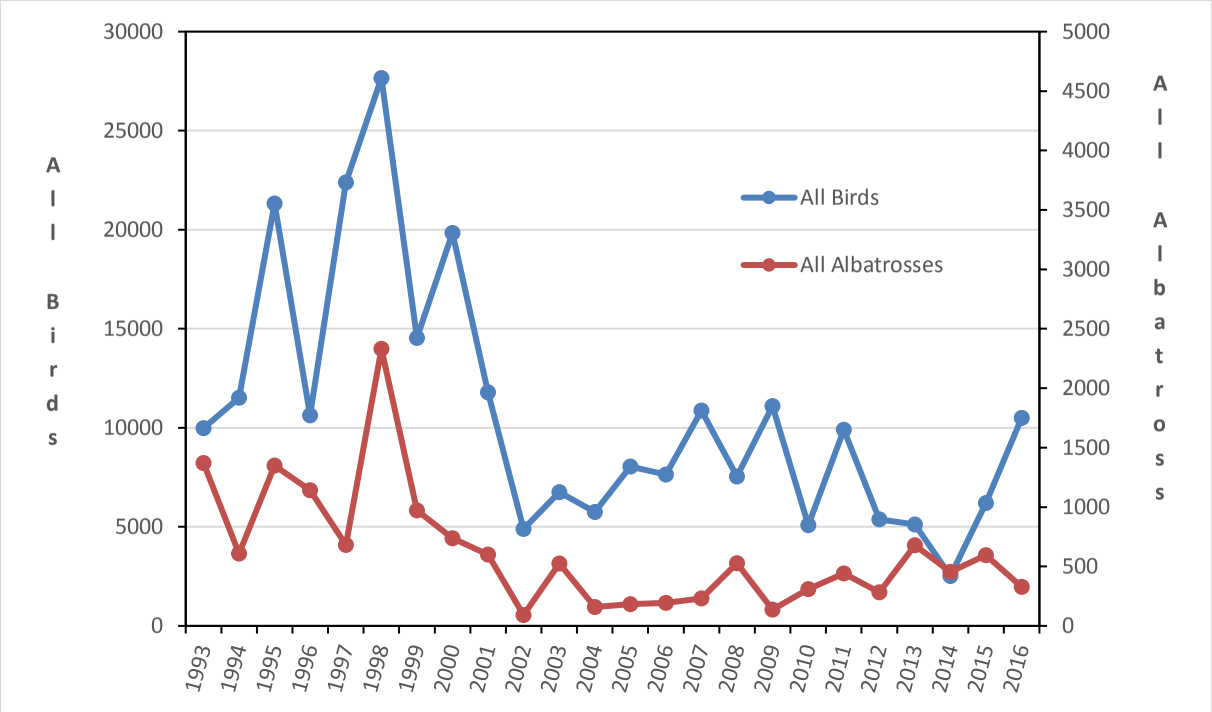

Figure 23 Seabird bycatch in Alaska groundfish (from 1993 through 2016) and halibut (from 2013 through 2016) fisheries (hook-and-line, trawl, and pot), noting bycatch estimates for all birds (left indices) and for albatross only (right indices). Note the difference in scale. Different data analysis methodologies are present: data from 1993 through 2006 are described in Fitzgerald et al. 2008; data from 2007 through 2015 are from the CAS.

Since 2013, the NMFS Alaska Region's CAS (Cahalan et al. 2010) has been used to calculate seabird bycatch estimates in the commercial halibut fishery, based on data collected from observers, which inform the annual report on seabird bycatch in Alaska.

The latest seabird bycatch report (Eich et al. 2016) provides seabird bycatch estimates by species or species group for the commercial Pacific halibut fishery off Alaska for 2013 through 2015. This biological assessment uses data provided by the CAS in 2016 (described in Section 4.2.7.). It is important to note that the CAS data continuously undergoes quality checks and thus may vary depending on when the data were taken from the system.

No short-tailed albatross have been recorded as bycatch in the commercial halibut fishery since the Observer Program expanded coverage to the commercial halibut fishery in 2013. Estimated bycatch of all seabirds by the commercial halibut fishery since 2013 is presented in Table 12.

Most estimated seabird bycatch is gulls taken in the GOA, followed by Northern fulmar in the GOA and BSAI. Over 150 black-footed and Laysan albatross are estimated to have been taken in the commercial halibut fishery from 2013 through 2016 (Table 12).

Table 12 Estimated seabird bycatch in the commercial halibut fishery. All hook-and-line gear. Source: Alaska CAS data described in Section 4.2.7.

	2013	2014	2015	2016	Grand Total
BSAI					
Black-footed Albatross	0	29	0	0	29
Laysan Albatross	17	0	21	0	38
Northern Fulmar	0	0	0	106	106
Gull	14	0	0	29	43
Unidentified	20	0	0	0	20
GOA					
Black-footed Albatross	51	33	0	0	84
Laysan Albatross	0	0	19	0	19
Northern Fulmar	0	19	41	59	119
Gull	75	99	144	42	359

As previously discussed in Section 4.2.6, data are collected from the onboard observers who record incidents of takes as well as industry reports of catch and production; however, the bycatch estimates provided in the Eich et al. (2016) report are based on data from the observer's species composition sample. Certain observer sampling biases are known to exist with commercial fisheries using hook-and-line gear. For example, seabirds may fall off a hook underwater without being seen by the observer, resulting in the potential for underreporting. However, birds that are observed to fall off the hooks alongside the vessel are recorded if they occur within the observer sample period, and vessels are required to retain dead seabirds as directed by the observer. Observers are then able to verify the species identification and determine whether to save the specimen as part of the AFSC-managed necropsy program. Seabird takes can occur either in the observer sample (extrapolated) or outside of the observer sample (not extrapolated). Currently, for short-tailed albatross, even if the bird is not brought on board with the fish caught, the observer will report any take if it is seen, regardless of whether it was in the sample period or not. The actual number (not extrapolated) of short-tailed albatross taken are used to determine whether the commercial halibut fishery in U.S. Convention waters off Alaska has exceeded the incidental take specified in the incidental take statement (USFWS 1998).

In the short-tailed albatross incidental take statement (USFWS 1998), USFWS anticipated up to two short-tailed albatross could be reported taken biannually (every 2 years) as a result of the halibut fishing activities in the U.S. Convention waters off Alaska. The commercial halibut fishery in U.S. Convention waters off Alaska has not exceeded the incidental take specified in the incidental take statement.

One short-tailed albatross take was reported in 1987 in the commercial halibut fishery in U.S. Convention waters off Alaska but none have been reported since. The premise for reinitiating consultation is that the likelihood of observing short-tailed albatross takes in the halibut fisheries has increased due to the addition of observer coverage to the commercial halibut fishery in 2013 and increasing short-tailed albatross population, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross takes. The number of commercial halibut vessels has decreased since 2009. In Areas 3A and 3B, where the highest concentration of effort (by weight of halibut caught and by number of hooks deployed) is seen, the effort has decreased since 2009. There have been no known takes since 1987, and no evidence to suggest there would be future takes.

USFWS has not designated critical habitat for this species.

6.9.2 Subsistence Pacific Halibut Fishery in the U.S. Convention waters off Alaska

The impact of subsistence halibut fishing on the short-tailed albatross is primarily limited to the potential disturbance by fishing vessels since there have been no observed takes of short-tailed albatross in subsistence halibut fishing operations.

While subsistence halibut fishing vessels may come into contact with short-tailed albatross, there have been no recorded takes of short-tailed albatross in the subsistence halibut fishery and thus the likelihood of incidental take of short-tailed albatross is discountable.

6.9.3 Sport Pacific Halibut Fishery in the U.S. Convention waters off Alaska

The impact of sport halibut fishing on the short-tailed albatross is primarily limited to the potential disturbance by fishing vessels since there have been no observed takes of short-tailed albatross in sport halibut fishing operations.

Birds are not attracted to sport fishing operations in the same manner as commercial fishing. This could be due to a number of differences, including the relative effort of the fisheries, gear, and the use of offal. Overall effort of the sport halibut fishery in the U.S. Convention waters off Alaska (approximately 5 mill lb; see Table 7 of Dykstra 2017) is less than that of commercial fishery in the GOA (approximately 14 mill lb; see Table 11). Commercial fishery gear uses millions of hooks. Gear used in the sport halibut fishery is a single line with no more than two hooks attached or a spear. Additionally, the hook-and-line gear used in the sport halibut fishery is heavily weighted and therefore sinks fast, reducing the time available for a bird to attempt to take the bait. Finally, offal is not used in sport fishing operations and therefore does not attract birds the way it does when it used in the commercial fisheries.

Sport halibut fishing is much less common in the western GOA and Bering Sea due to the relative remoteness of the ports. Areas 3A, 3B, and 4 have a daily bag limit of two halibut for the guided and unguided fisheries. In 2016, the sport halibut fishery harvested 3,492,000 lb in Area 3A, 5,000 lb in Area 3B, and 12,000 in Area 4A (IPHC 2017).

While sport halibut fishing vessels may come into contact with short-tailed albatross in Areas 3A, 3B, and 4A, there have been no recorded takes of short-tailed albatross in the sport halibut fishery and thus the likelihood of incidental take of short-tailed albatross is discountable.

6.10 Indirect Effects of the Halibut Fisheries in U.S. Convention waters off Alaska

The only non-fishery related threats listed in Section 6.7 that may occur as an indirect effect of the halibut fisheries in U.S. Convention waters off Alaska are release of contaminants due to fishing activities and possibly the impact of competition for food (e.g., squid). The probability that any of the contaminants from fishing activities would rise to the level of adversely affecting the short-tailed albatross is unlikely. The likelihood that the halibut fisheries in U.S. Convention waters off Alaska would alter the short-tailed albatross' natural foraging strategy is unlikely given that short-tailed albatross forage by scavenging primarily on dying mesopelagic or meso-bathypelagic squid at the surface (Walker et al. 2015). Additionally, no conservation concerns exist for squid populations in the BSAI and GOA

(NPFMC 2017b). These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the short-tailed albatross.

7.0 Steller's Eider

7.1 Species Description

The Steller's eider is the smallest, weighing an average of 800 grams (1.8 pounds), of four eider species found in the Northern Hemisphere. There are three breeding populations of Steller's eider: two in Arctic Russia and one in Alaska. The Russian breeding populations consist of two breeding and wintering populations, the Russian-Atlantic and the Russian-Pacific populations. The Russian-Pacific population and the Alaska-breeding population are visually indistinguishable and can occur in the same areas during autumn molt, winter, and spring migration.

The Alaska-breeding population of the Steller's eider was listed as a threatened species in 1997 (62 FR 31748, June 11, 1997) and is the only population of the Steller's eider listed under the ESA. The listing was based on a substantial decrease in the species' nesting range in Alaska, a reduction in the number of Steller's eiders nesting in Alaska, and the resulting increased vulnerability of the remaining breeding population to extirpation.

7.2 Breeding

Actual numbers nesting in Alaska and Russia are unknown but the majority of Steller's eiders nest in arctic Russia. The Alaska-breeding population predominately nests on the Arctic Coastal Plain with a small subpopulation on the Yukon-Kuskokwim Delta. The Alaska-breeding population nests in the terrestrial environment and can lay one to eight eggs that incubate for about 25 days. Hatchlings hatch in late June and face threats from many animal predators. The hatchlings are generally capable of flight around 40 days after hatching. (USWFS 2002a)

7.3 Range

The Alaska-breeding population occurs in western Alaska and northern Alaska. Steller's eiders spend the majority of the year in shallow, nearshore marine waters. Along open coastline, Steller's eiders usually remain within about 400 m of shore, normally in water less than 10 m deep, but can be found well offshore in shallow bays and lagoons or near reefs. (62 FR 31748, June 11, 1997)

In spring, large numbers concentrate in Bristol Bay before migration (62 FR 31748, June 11, 1997). They are also found in estuaries along the north side of the Alaska Peninsula before migrating northward to nesting areas. Steller's eider nest on tundra near small water bodies where hatchlings feed on aquatic insects and plants. (USFWS 2002a)

After the nesting season, Steller's eiders return to marine habitats, where they undergo a complete molt, and remain flightless for 3 weeks. Concentrations of molting Steller's eiders have been noted in Russia, near Saint Lawrence Island in the Bering Sea, and along the northern shore of the Alaska Peninsula. Many Steller's eiders disperse to the Aleutian Islands and the south side of the Alaska Peninsula after molting, although some remain in the molting areas until freezing temperatures force them south.

In the winter Steller's eiders are found a few hundred meters off shore. Whereas the Russian-Atlantic population winters in the Barents and Baltic Seas, the Russian-Pacific population winters in the southern Bering Sea and North Pacific Ocean, where it presumably intermixes with the Alaska-breeding population. During winter, most of the world's Steller's eiders concentrate along the Alaska Peninsula, from the eastern Aleutian Islands to southern Cook Inlet, in shallow, nearshore marine waters.

7.4 Foraging

Steller's eiders feed by diving and dabbling for mollusks and crustaceans in shallow, nearshore marine waters. Primary foods in marine areas include bivalves, crustaceans, polychaete worms, and mollusks (62 FR 31748, June 11, 1997).

7.5 Population

The Russian-Atlantic population is believed to contain 30,000 to 50,000 individuals, and the Russian-Pacific population likely numbers 100,000 to 150,000; the threatened Alaska-breeding population, however, is thought to number only in the low hundreds or low thousands on the Arctic coastal plain, and possibly only tens or hundreds on the Yukon-Kuskokwim Delta. Overall numbers have likely declined from historical population sizes.

7.6 Recovery Criteria

The USFWS (2002a) states that the Steller's eider Alaska-breeding population will be considered for reclassification from threatened to endangered under the following conditions:

> The population has ≥ 20 percent probability of extinction in the next 100 years for 3 consecutive years; OR
> The population has ≥ 20 percent probability of extinction in the next 100 years and is decreasing in abundance.

The USFWS (2002a) states that the Steller's eider Alaska-breeding population will be considered for delisting from threatened status when:

> The Alaska-breeding population has ≤1 percent probability of extinction in the next 100 years; AND
> Subpopulations in each of the northern and western subpopulations have ≤ 10 percent probability of extinction in 100 years and are stable or increasing.

The USFWS (2002a) states that if the subpopulations qualify as distinct vertebrate population segments, one subpopulation (northern or western) can be delisted separately when:

> The subpopulation is stable or increasing and has ≤ 1 percent probability of extinction in the next 100 years.

In the event that one subpopulation is delisted separately, the second subpopulation can be delisted when:

> The subpopulation has ≤ 10 percent probability of extinction in 100 years (USFWS 2002a).

7.7 Critical Habitat

USFWS used the best scientific and commercial information available in determining which areas are essential to the conservation of Steller's eiders and may require special management considerations or protection. The primary constituent elements include space for individual and population growth, and

for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species. In addition to physical and biological features, UFWS also used qualitative criteria to select critical habitat. These include 1) identifying areas where Steller's eiders consistently occur at relatively high densities, 2) identifying areas where Steller's eiders are especially vulnerable to disturbance and contamination due to flightlessness, and 3) identifying areas essential to survival and recovery given the USFWS's best available data. In addition, the USFWS avoided developed areas in critical habitat designation.

Based on these considerations, the USFWS designated critical habitat for the Alaska-breeding population of the Steller's eider, which became effective on March 5, 2001 (66 FR 8850, February 2, 2001). It includes breeding habitat on the Yukon-Kuskokwim Delta and four units in the marine waters of southwest Alaska, including the Kuskokwim Shoals in northern Kuskokwim Bay, and Seal Islands, Nelson Lagoon, and Izembek Lagoon on the north side of the Alaska Peninsula. These areas total approximately 7,333 square kilometers (km) (approximately 2,830 square miles; 733,300 hectares; 1,811,984 acres) and 1,363 km (852 miles) of shoreline.

Kuskokwim Shoals

The Kuskokwim Shoals is known to be of importance to Steller's eiders during molt and for staging during spring migration. A series of surveys has shown that large numbers of Steller's eiders stage near the Kuskokwim Shoals during spring migration, apparently foraging along the edge of the extensive shorefast ice that lingers into late April in this region.

Seal Islands

The Seal Islands Unit consists of several disjunct bays, lagoons, and nearshore areas. Steller's eiders concentrate in the Seal Islands lagoon in both spring and fall. Although the area has been inadequately surveyed for Steller's eiders, thousands are believed to molt in this lagoon. Steller's eider spring migration surveys further indicate the area's importance to a large number of Steller's eiders. Finally, Steller's eiders that breed near Barrow also molt in the Seal Islands lagoon.

Nelson Lagoon

The Nelson Lagoon complex includes Nelson Lagoon, Herendeen Bay, and Port Moller. Use of the Nelson Lagoon complex by huge numbers of Steller's eiders during autumn molt is well documented. Dense aggregations also winter in the Nelson Lagoon complex, although ice cover may force them elsewhere during variable portions of colder winters. Large numbers can remain (or possibly rebuild) in late spring during migration as well. In addition to the very large numbers using this lagoon complex annually, banding data have demonstrated that Steller's eiders molting in Nelson Lagoon include members of the Alaska-breeding population. Observations show that Steller's eiders occur in dense clusters throughout most of Nelson Lagoon, including the area surrounding the community of Nelson Lagoon.

Izembek Lagoon

Izembek Lagoon is used by dense aggregations of Steller's eiders during molt, winter, and spring. Tens of thousands molt there each year. Tens of thousands also remain through winter in most years, although distribution and numbers are affected by ice cover and vary from year to year. Numbers may build again during spring. In addition to dense aggregations of Steller's eiders regularly occurring at Izembek, band recoveries show that the birds molting there include members of the Alaska-breeding population.

7.8 Threats

Sport hunting of Steller's eiders in Alaska has been closed since 1991 but some illegal sport and subsistence harvest still occurs. While there are no established causes of decline of Steller's eiders, several potential threats have been identified. These include potential lead poisoning, caused by ingesting spent lead shot; predation on the breeding grounds; marine traffic disturbance of feeding flocks; and oil contamination from marine shipping and commercial fishing. Other possible threats include disease, marine contaminants, and changes in the Bering Sea and North Pacific ecosystem that may affect food availability (USFWS 2002a).

Within the marine distribution of the Steller's eiders, the environment has likely been affected by human activities, including marine transport, commercial fishing, and environmental pollutants. Another possible threat is changes in the Bering Sea ecosystem affecting food availability. However, no evidence exists that modifications of the marine environment have caused the decline of the Alaska-breeding population of Steller's eiders (62 FR 31748, June 11, 1997).

7.9 Effects of the Halibut Fisheries in U.S. Convention Waters off Alaska

USFWS identified the following ways in which eiders or their habitat may be affected by commercial fisheries: 1) large numbers of small fuel and oil spills, including the practice of discharging oily bilge water; 2) fundamental changes in the marine ecosystem brought about by harvest or overharvest of fish and shellfish; 3) vessel strikes in which eiders collide with fishing vessels that are using bright lights during inclement weather; and 4) the alteration of the benthic environment by trawl gear (66 FR 9146, February 6, 2001). Trawl gear is not used by the halibut fisheries in the U.S. Convention waters off Alaska, therefore the benthic habitat is not likely to be disturbed by these fisheries.

7.9.1 Direct Effects on Steller's Eider and Its Critical Habitat

There is no recorded take of Steller's eider in the halibut fisheries in U.S. Convention waters off Alaska. Very limited halibut fishing occurs in the Steller's eider critical habitat near Cape Avinof. While halibut fishing vessels may come into contact with Steller's eider, there is no documented evidence to suggest that hook-and-line fishing would disturb Steller's eider. Therefore, any direct effects from the halibut fisheries in U.S. Convention waters off Alaska on the Alaska-breeding population of Steller's eider or its critical habitat are expected to be discountable. No direct effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the Alaska-breeding population of Steller's eider or its critical habitat.

7.9.2 Indirect Effects on Steller's Eider and Its Critical Habitat

For the groundfish fisheries off Alaska, the USFWS (2003) stated that fisheries-related incidental take of Steller's eiders or effects to their habitat may occur indirectly, in association with petroleum spills, vessel strikes, or pollution from seafood processing plant effluents. However, USFWS did not find it appropriate to authorize such take to NMFS in 2003 (USFWS 2003). The justification for this decision stated that:

> First, such take is believed to be minimal, since any fishing vessel petroleum spills occurring outside of harbors are likely to be rare, and the effects of such spills to Steller's eiders (which tend to congregate in harbors and lagoons) would be negligible. Secondly, take related to petroleum spills and vessel strikes within harbor areas and seafood processing plant effluent has been addressed and authorized in previous

consultations with the EPA, Denali Commission, and Corps of Engineers (USFWS 2001a, 2001b, 2001c, 2002b). Additional take of Steller's eiders from these sources may be addressed in future consultations on harbor or fuel facility construction or expansion, consultations with the U.S. Coast Guard on their permitting process, and others. Consequently, we anticipate no incidental take of Steller's eiders in association with the NMFS Total Allowable Catch (TAC)-setting process, and no such take is authorized.

No take of Steller's eider has been reported from these sources, thus the probability that petroleum spills, vessel strikes, or pollution from seafood processing plant effluents would rise to the level of adversely affecting the Alaska-breeding population of Steller's eider or its critical habitat is unlikely. These indirect effects are expected to be discountable. Further, NMFS does not regulate petroleum spills or pollution, as described in the paragraph above. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the Alaska-breeding population of Steller's eider or its critical habitat.

8.0 Spectacled Eider

8.1 Species Description

The spectacled eider is a large sea duck, 52 to 56 centimeters long (20 to 22 inches). In the winter and spring, adult male spectacled eiders are in breeding plumage with a black chest, white back, and pale green head with a long sloping forehead and black-rimmed white spectacle-like patches around the eyes. During the late summer and fall, males are mottled brown. Females and juveniles are mottled brown year-round with pale brown eye patches. Both males and females have sloped foreheads and bills, giving them a characteristic profile. Spectacled eiders are diving ducks that spend most of the year in marine waters where they primarily feed on bottom-dwelling mollusks and crustaceans.

The spectacled eider was listed as a threatened species throughout its range on June 9, 1993 (58 FR 27474, May 10, 1993) because of documented population declines. The listing was largely based on steep declines in the Yukon-Kuskokwim Delta (Y-K Delta) and Arctic Coastal Plain (ACP) breeding populations; the size of the Arctic Russia breeding population was unknown at listing.

8.2 Breeding

As of 2010, there were three primary breeding populations: on Alaska's ACP and Y-K Delta, and along the Arctic coast of Russia from the Chaun Delta to the Yana Delta. Incubation lasts approximately 22 days. Males leave breeding grounds after incubation begins. Spectacled eider clutch size varies among years and study sites but was approximately four to five eggs which incubate for about 22 days. Depending on location, hatchlings hatch from mid-June through early July. Nest success, the probability that a nest survives to hatch at least one egg, is variable and greatly influenced by predators, including gulls (*Larus* spp.), jaegers (*Stercorarius* spp.), and red (*Vulpes vulpes*) and arctic (*Alopex lagopus*) foxes. After fledging, broods move from freshwater to marine habitats. The hatchlings are generally capable of flight around 50 days after hatching. (USWFS 2010)

8.3 Range

The range of the spectacled eider is described in detail in the most recent USFWS 5-year review (USFWS 2010). The historical population distribution in Russia is not well described (USFWS 2010). In the United States, spectacled eiders historically had a discontinuous nesting distribution from the Nushagak

Peninsula in southwestern Alaska north to Barrow and east nearly to the Canadian border. Today two breeding populations remain in Alaska (66 FR 9146, February 6, 2001). The remainder of the species breeds in Arctic Russia. The species throughout its range, including the Arctic Russian population, is listed under the ESA (16 U.S.C. 1531 et seq.) as threatened wherever it occurs

Spectacled eiders use multiple habitat types throughout their range in Alaska and Russia. From November through March or April, they remain in open sea or in areas of open water in sea ice of the northern Bering Sea. In the spring, spectacled eiders move to nesting areas on wet coastal tundra in breeding pairs and establish nests near shallow ponds or lakes. Males return to the sea after incubation begins. After breeding, spectacled eiders molt in several discrete areas. Use of the Beaufort Sea could be a function of ice cover at the time of departure from breeding areas, since near shore areas remain ice-covered until late June or early July. Late summer and fall molting areas have been identified in eastern Norton Sound and Ledyard Bay in Alaska, and in Russia in Mechigmenskiy Bay and an area offshore between the Kolyma and Indigirka River deltas on the Arctic Ocean (USFWS 2010). Females travel along the coast up to 60 km (36 miles) offshore to molting areas in July if unsuccessful at nesting, or in August/September if successful. Molting flocks gather in relatively shallow coastal water, usually less than 36 m (120 ft) deep. (USFWS 2010)

8.4 Foraging

Spectacled eiders are diving ducks that spend most of the year in marine waters where they primarily feed on benthic invertebrates, primarily clams and crustaceans (USFWS 2010). During the breeding season hens and broods feed in freshwater ponds and wetlands, eating aquatic insects, crustaceans, and vegetation (USFWS 2010).

8.5 Population

Winter surveys of the only known wintering area of this species (presumed to represent the world population) provided a total species estimate of 369,122 in 2010 (Larned et al. 2012, Sea Duck Joint Venture 2016). Overall numbers have declined from historical population sizes. From 1972 to 1992, the Y-K Delta spectacled eider breeding population had declined from an estimated 47,700 to 70,000 pairs to fewer than 2,000 pairs (USFWS 2010). Populations in the other two primary breeding areas, the Russian and Alaskan Arctic Coastal Plains, and the much smaller breeding population on St. Lawrence Island in the Bering Sea also declined (Sea Duck Joint Venture 2016).

8.6 Recovery Criteria

The Spectacled Eider Recovery Plan (USFWS 1996) states that the spectacled eider will be considered for reclassification from threatened to endangered when these five factors are reviewed for evidence of threats to the population and when:

The population is declining by =5%/year, as judged by the following statistical measures:

- the under-protection loss exceeds the over-protection loss, which is calculated using trend data [based on at least 5 years (1 survey/year) of data but not exceeding a- 15 year period] and loss functions where the loss when classifying is zero when r =-0.05 and the loss when not classifying is zero when r ~ 0 (figure 9); AND
- the minimum estimated population size is ~3,000 breeding pairs for ~1 year; OR

The minimum estimated population size is 2,000 breeding pairs.

The USFWS (2010) states that the spectacled eider will be considered for delisting from threatened status when the population is increasing as judged by:

> A Bayesian analysis indicating the over-protection loss exceeds the under-protection loss (see Appendix II, Figure II-1 in [USFWS 1996]), and the minimum estimated population size is ≥6,000 breeding pairs;
> The minimum estimated population size is ≥10,000 breeding pairs over ≥3 surveys; or
> The minimum estimate of abundance exceeds 25,000 breeding pairs in any survey.

The Y-K Delta population could be approaching delisting criteria as judged by one of the statistical measures in the delisting criteria (USFWS 2010). Due to unknown factors, the ACP population has not approached the delisting criteria, and appears to be declining (USFWS 2010).

No population trend for the Russian population has been estimated. However, 2009 data estimated that the minimum world population of spectacled eiders is 301,812 birds; therefore, taking into account the number of birds estimated in the two Alaska populations, the Arctic Russia population exceeds the delisting criteria (USFWS 2010).

8.7 Critical Habitat

USFWS used the best scientific and commercial information available in determining which areas are essential to the conservation of spectacled eiders and may require special management considerations or protection. The primary constituent elements include space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, and rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Based on these considerations, the USFWS designated critical habitat for the spectacled eider, which became effective on March 8, 2001 (66 FR 9146, February 6, 2001). Critical habitat was designated for molting in Norton Sound and Ledyard Bay, for nesting on the Y-K Delta, and for wintering south of St. Lawrence Island. These areas total approximately 10,098,827 hectares (100,988.3 square km; 38,991.6 square miles; 24,954,638 acres).

<u>Yukon-Kuskokwim Delta (Y-K Delta)</u>
The Y-K Delta is one of three primary breeding populations for spectacled eider in the world (USFWS 2010).

The USFWS's final rule listing critical habitat for the spectacled eider (66 FR 9146, February 6, 2001) states:

> On the Y–K Delta, spectacled eiders breed mostly within 15 kilometers (km) (9.3 statute miles (mi)) of the coast from Kigigak Island north to Kokechik Bay (Service 1996), with smaller numbers nesting south of Kigigak Island to Kwigillingok and north of Kokechik Bay to the mouth of Uwik Slough. The coastal fringe of the Y–K Delta is the only subarctic breeding habitat where spectacled eiders occur at high density (3.0–6.8 birds/square kilometer (km^2), 1.2–2.6 birds/square mile (mi^2)) (Service 1996). Nesting on the Y–K Delta is restricted to the vegetated intertidal zone (areas dominated by low wet-sedge and grass marshes with numerous small shallow water bodies). Nests are rarely

more than 190 meters (m) (680 feet (ft)) from water and are usually within a few meters of a pond or lake.

Arctic Coastal Plain (ACP)
The ACP is one of three primary breeding populations for spectacled eider in the world (USFWS 2010).

Norton Sound
Norton Sound is known to be of importance to spectacled eiders during molt (early July through October) (66 FR 9146, February 6, 2001).

Ledyard Bay
Ledyard Bay is known to be of importance to spectacled eiders during molt (early July through October) (66 FR 9146, February 6, 2001).

Bering Sea between St. Lawrence and St. Matthew Islands
The Bering Sea between St. Lawrence and St. Matthew Islands is known to be of importance to spectacled eiders as a wintering area.

8.8 Threats

Ongoing threats to spectacled eiders on the breeding grounds are thought to include lead contamination, illegal harvest, and predation. No significant threats in the marine environment currently affect spectacled eider survival or recovery. However, two factors, climate change and offshore oil spills, could conceivably affect spectacled eiders at the population level in the future. Climate change effects could threaten spectacled eiders in both terrestrial and marine habitats although no negative effects on spectacled eiders are known at this time. (USFWS 2010)

Potential threats from contamination from oil and gas development on the ACP include accidental spills, off-road vehicle use, wetland filling, and indirect effects of human presence (USFWS 2010). USFWS (2010) identified oil and gas development in the Chukchi and Beaufort Seas as a potential threat to spectacled eiders. It was noted that although the probability of a spill is low, the remoteness and weather conditions in the Arctic would make oil spill containment difficult, causing large effects on the ACP breeding population, particularly in molting areas where eiders are flightless for several weeks each autumn. Collision with man-made structures is also a potential threat to spectacled eiders. Other threats include toxic contaminants in the marine environment as well as indirect effects of shifting populations of species with overlapping food habits. (USFWS 2010)

The spectacled eider has been closed to sport hunting under the Migratory Bird Treaty Act since 1991. Limited subsistence harvest was allowed until 2003 however USFWS (2010) discusses harvest after 2003 along the western and northern coasts of Alaska and in eastern Russia. Disease and predation (by glaucous gulls and arctic foxes) are also threats to the spectacled eider (USFWS 2010).

8.9 Effects of the Halibut Fisheries in U.S. Convention Waters off Alaska

USFWS (66 FR 9146, February 6, 2001) identified the following ways in which eiders or their habitat may be affected by commercial fisheries: 1) large numbers of small fuel and oil spills, including the practice of discharging oily bilge water; 2) fundamental changes in the marine ecosystem brought about by harvest or overharvest of fish and shellfish; 3) vessel strikes in which eiders collide with fishing vessels that are using bright lights during inclement weather; and 4) the alteration of the benthic environment by

trawling gear. Trawl gear is not used by the halibut fisheries in the U.S. Convention waters off Alaska, therefore the benthic habitat is not likely to be disturbed by these fisheries.

8.9.1 Direct Effects on Spectacled Eider and Its Critical Habitat

Of the ways USFWS (66 FR 9146, February 6, 2001) identified that eiders or their habitat may be affected by commercial fisheries, none are direct effects. In fact, USFWS (2010) concluded that commercial fishing was not a threat to spectacled eiders at the time the document was written.

No halibut fisheries occur in spectacled eider critical habitat. Therefore there are no direct effects from the halibut fisheries in U.S. Convention waters off Alaska on the threatened spectacled eider or its critical habitat.

8.9.2 Indirect Effects on Spectacled Eider and Its Critical Habitat

Of the ways USFWS (66 FR 9146, February 6, 2001) identified that eiders or their habitat may be affected by commercial fisheries, the potential indirect effects include large numbers of small fuel and oil spills, including the practice of discharging oily bilge water; fundamental changes in the marine ecosystem brought about by harvest or overharvest of fish and shellfish; and vessel strikes in which eiders collide with fishing vessels that are using bright lights during inclement weather.

There is no recorded take of spectacled eider in the halibut fisheries in U.S. Convention waters off Alaska from these sources. The probability that petroleum spills, vessel strikes, or alterations in the marine ecosystem would rise to the level of adversely affecting the spectacled eider or its critical habitat is unlikely. These indirect effects are expected to be discountable. Further, NMFS does not regulate petroleum spills or pollution. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the spectacled eider or its critical habitat.

9.0 Cumulative Effects

Cumulative effects are the effects of future State, tribal, local, and private actions, not involving a Federal action, that are reasonably certain to occur within the action area.

9.1 State-managed Fisheries

State-managed fisheries generally occur from 0 to 3 miles offshore; however, some State-managed fisheries (e.g., Tanner crab) may extend into Federal waters. State-managed commercial fisheries that occur in the vicinity of the short-tailed albatross, Steller's eider, and spectacled eider are salmon, herring, and shellfish. These fisheries may be subject to changes from one fishing season to the next. The Alaska 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. Regulation announcements, news releases, and updates are available on the ADF&G Web site.[9]

[9] http://www.adfg.alaska.gov/

The State of Alaska establishes harvest quotas independent of Federal and parallel fisheries for State-waters seasons. State-managed fisheries are controlled by guideline harvest levels (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 6 percent of the Federal ABC (80 FR 11919, March 5, 2015). In the GOA, the State-managed Pacific cod fishery is allocated 30 percent of the Federal ABC in the Western GOA and 25 percent of the Federal ABC in the Central GOA (80 FR 10250, February 25, 2015). Typically, the State sets the fishery quotas and opens State-managed fisheries after Federal fisheries conclude in adjacent waters. State-managed fisheries are discussed below.

9.1.1 Northern Areas

The Northern Area includes all waters of Alaska north of the latitude of the western-most tip of Point Hope and west of 141 degrees West longitude, including those waters draining into the Arctic Ocean and the Chukchi Sea (Estensen et al. 2012). Regulations adopted by the Board of Fisheries allow ADF&G to issue permits for the commercial harvest of freshwater species of fish such as whitefish, sheefish, char, northern pike, blackfish, and Arctic lamprey. Many subsistence fishermen operate gillnets to harvest marine and freshwater finfish in the rivers and coastal marine waters. Subsistence fishermen have reported small numbers of chum, pink, and Chinook salmon along the Arctic coast. Mainly in the fall and winter months, traps and fish weirs of various designs are used to harvest whitefish, blackfish, and burbot; Northern pike, char, and "tomcod" are frequently taken through the ice by hand lines. There is insufficient documentation of the harvest of non-salmon finfish in the Northern Area (Estensen et al. 2012). Annual community fish catches from Kaktovik and Anaktuk Pass, two small Inupiat communities in the Northern Area, showed harvest of similar non-salmon finfish. Harvests in Kaktovik consisted of Dolly Varden, Arctic cisco, Arctic grayling, lake trout, salmon, and Arctic cod (Pedersen and Linn, 2005), and in Anaktuvuk Pass, "char" (a mix of Arctic char and Dolly Varden), lake trout, Arctic grayling, Arctic cisco, and few burbot (Pedersen and Hugo 2005).

9.1.2 Norton Sound, Port Clarence, Kotzebue

Norton Sound, Port Clarence and Kotzebue areas include all waters from Point Romanof in southern Norton Sound to Point Hope, and St. Lawrence Island (Menard et al. 2012). Five species of Pacific salmon are indigenous to the area although chum and pink salmon historically are the most abundant. Most herring spawning populations arrive near the eastern Bering Sea coast immediately after ice breakup between mid-May and mid-June. Spawning progresses northward and may continue along portions of the Seward Peninsula or within the Chukchi Sea into July or August (Bernard 2011). Commercial fisheries include herring and salmon. Subsistence fisheries include red king crab, capelin, rainbow smelt, northern pike, starry flounder, yellow fin sole, Arctic flounder, Alaska plaice, Arctic grayling, burbot, and halibut. Other species utilized for commercial and subsistence purposes include inconnu or "sheefish," Dolly Varden, and whitefish. These fish are taken by set gill nets, beach seines, "jigging" through the ice, and rod and reel (Menard et al. 2012).

9.1.3 Bristol Bay

The Bristol Bay management area includes all coastal and inland waters east of a line from Cape Newenham to Cape Menshikof. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year, but Chinook, chum, coho, and in even years, pink salmon returns are important to the fishery as well. The five species of Pacific salmon found in Bristol Bay are the focus of

major commercial, subsistence, and sport fisheries. Pacific herring have been documented throughout Bristol Bay, but a major concentration returns to the Togiak area each spring to spawn and is the focus of herring sac roe and spawn-on-kelp fisheries. (Jones et al. 2013).

9.1.4 North Alaska Peninsula

The North Alaska Peninsula portion of the Alaska Peninsula Management Area includes those waters of the Alaska Peninsula from Cape Sarichef to Cape Menshikof. Most commercial salmon fishing effort on the North Alaska Peninsula targets sockeye salmon. In 2010, a commercial herring sac roe fishery occurred in the North Alaska Peninsula (Bernard 2011).

9.2 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 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 (United States Environmental Protection Agency 2012). The potential effects of any future mining activity in Bristol Bay on the short-tailed albatross, spectacled eider, and Steller's eider, and their potential prey are also unknown at this time.

10.0 Conclusions

NMFS is reinitiating ESA section 7 consultation for the Pacific halibut fisheries in U.S. Convention waters off Alaska. The purpose of this biological assessment is to determine if these fisheries adversely affect ESA-listed seabirds or designated critical habitat in the BSAI and GOA. Three ESA-listed species are considered in this biological assessment: the endangered short-tailed albatross, the threatened Alaska-breeding population of Steller's eider, and the threatened spectacled eider. Critical habitat has been designated for the Alaska-breeding population of Steller's eider and the spectacled eider.

NMFS restructured the Observer Program in January 2013 to improve observer data quality, more equitably distribute the industry's observer coverage costs, and expand observer coverage to vessels less than 60 ft LOA and the commercial halibut sector (77 FR 70062, November 21, 2012).

NMFS is reinitiating consultation because increases in the short-tailed albatross population in conjunction with the addition of observer coverage increases the likelihood of observing short-tailed albatross interactions in the halibut fisheries. A summary of our conclusions and justifications are provided below.

- The commercial Pacific halibut fishery in U.S. Convention waters off Alaska is likely to adversely affect the short-tailed albatross.

- The subsistence and sport Pacific halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the short-tailed albatross.
- The Pacific halibut fisheries in U.S. Convention waters off Alaska are not likely to adversely affect the spectacled eider, designated critical habitat for the spectacled eider, the Alaska-breeding population of the Steller's eider, or designated critical habitat for the Alaska-breeding population of the Steller's eider.

10.1 Short-tailed Albatross

One short-tailed albatross take occurred in 1987 in the commercial halibut fishery in U.S. Convention waters off Alaska but none has been reported since. Therefore, the halibut fishery has a direct effect on short-tailed albatross. The premise for reinitiating consultation is that the likelihood of observing short-tailed albatross takes in the halibut fisheries has increased due to the addition of observer coverage in 2013 and increasing short-tailed albatross population, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross takes. The number of halibut vessels has decreased since 2009. In Areas 3A and 3B, where the highest concentration of effort (by weight of halibut caught and by number of hooks deployed) is seen, the effort has decreased since 2009. There have been no takes since 1987, 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 short-tailed albatross is no greater now than in the past.

While subsistence and sport halibut fishing vessels may come into contact with short-tailed albatross, there have been no recorded takes of short-tailed albatross in the subsistence or sport halibut fisheries, and thus the likelihood of incidental take of short-tailed albatross is discountable.

The only threats on the short-tailed albatross that may occur as an indirect effect of the halibut fisheries in U.S. Convention waters off Alaska are release of contaminants due to fishing activities and possibly the impact of competition for food (e.g., squid). The probability that any of the contaminants from fishing activities would rise to the level of adversely affecting the short-tailed albatross is unlikely. The likelihood that the halibut fisheries in U.S. Convention waters off Alaska would alter the short-tailed albatross' natural foraging strategy is unlikely given that short-tailed albatross scavenge primarily on dying mesopelagic or meso-bathypelagic squid at the surface (Walker et al. 2015). Additionally, no conservation concerns exist for squid populations in the BSAI and GOA (NPFMC 2017b). These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the short-tailed albatross.

No critical habitat has been designated for short-tailed albatross.

10.2 Steller's Eider and Steller's Eider Critical Habitat

No recorded take of Steller's eider has occurred in the halibut fisheries in U.S. Convention waters off Alaska. Therefore there are no direct effects from the halibut fisheries in U.S. Convention waters off Alaska on the threatened Alaska-breeding population of Steller's eider or its critical habitat.

The only threats on the Alaska-breeding population of the Steller's eider or its critical habitat that may occur as an indirect effect of the halibut fisheries in U.S. Convention waters off Alaska are petroleum spills, vessel strikes, or pollution from seafood processing plant effluents. These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention

waters off Alaska are expected to adversely affect the threatened Alaska-breeding population of the Steller's eider or its critical habitat.

10.3 Spectacled Eider and Spectacled Eider Critical Habitat

No recorded take of spectacled eider has occurred in the halibut fisheries in U.S. Convention waters off Alaska. No halibut fisheries occur in spectacled eider critical habitat. Therefore there are no direct effects from the halibut fisheries in U.S. Convention waters off Alaska on the threatened spectacled eider or its critical habitat.

The only threats on the spectacled eider or its critical habitat that may occur as an indirect effect of the halibut fisheries in U.S. Convention waters off Alaska are large numbers of small petroleum spills; fundamental changes in the marine ecosystem brought about by harvest or overharvest of fish and shellfish; and vessel strikes. These indirect effects are expected to be discountable. Thus, no indirect effects from the halibut fisheries in U.S. Convention waters off Alaska are expected to adversely affect the threatened spectacled eider or its critical habitat.

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12.0 Appendices

Table 13 Subsistence halibut gear limits by IPHC regulatory area and permit type (50 CFR 300.65(h)(I)(i)).

Regulatory Area	Permit Type	Gear Restrictions
2C - Except Sitka Sound, and Ketchikan and Juneau non-subsistence marine waters areas	SHARC	30 hooks per vessel
	Ceremonial	30 hooks per vessel
	Educational	30 hooks per vessel
	Community Harvest	30 hooks per person onboard; up to 90 hooks per vessel
2C - Sitka Sound	SHARC	September 1 through May 31: 30 hooks per vessel
		June 1 through August 31: 15 hooks per vessel; no power hauling
	Ceremonial	September 1 through May 31: 30 hooks per vessel
		June 1 through August 31: fishing under Ceremonial Permit not allowed
	Educational	30 hooks per vessel
	Community Harvest	fishing under Community Harvest Permit not allowed
2C--Ketchikan and Juneau non-subsistence marine waters areas	SHARC	General subsistence halibut fishing not allowed
	Ceremonial	30 hooks per vessel
	Educational	30 hooks per vessel
	Community Harvest	fishing under Community Harvest Permit not allowed
3A--Except Chiniak Bay, and Anchorage-Matsu-Kenai and Valdez non-subsistence marine waters areas	SHARC	30 hooks per person onboard; up to 90 hooks per vessel
	Ceremonial	
	Educational	
	Community Harvest	
3A--Chiniak Bay	SHARC	30 hooks per person onboard; up to 90 hooks per vessel
	Ceremonial	
	Educational	
	Community Harvest	
3A--Anchorage-Matsu-Kenai and Valdez non- subsistence marine waters areas	SHARC	General subsistence halibut fishing not allowed
	Ceremonial	30 hooks per person onboard up to 90 hooks per vessel
	Educational	30 hooks per person onboard up to 90 hooks per vessel
	Community Harvest	fishing under Community Harvest Permit not allowed
3B	SHARC	30 hooks per person onboard up to 90 hooks per vessel
4A and 4B	SHARC	30 hooks per person onboard up to 90 hooks per vessel
4C, 4D, and 4E	SHARC	no hook limit

Table 14 Subsistence halibut harvest limits by IPHC regulatory area and permit type (50 CFR 300.65(h)(2)).

Regulatory Area	Permit Type	Gear Restrictions
2C--Except Sitka Sound, and Ketchikan and Juneau non-subsistence marine waters areas	SHARC	20 halibut per day per vessel and in possession
	Ceremonial	25 halibut per permit
	Educational	25 halibut per permit
	Community Harvest	no daily or possession limit
2C--Sitka Sound	SHARC	September 1 through May 31: 10 halibut per day per vessel and in possession
		June 1 through August 31: 5 halibut per day per vessel and in possession
	Ceremonial	September 1 through May 31: 25 halibut per permit
		June 1 through August 31: fishing under Ceremonial Permit not allowed
	Educational	25 halibut per permit
	Community Harvest	fishing under Community Harvest Permit not allowed
2C--Ketchikan and Juneau non-subsistence marine waters areas	SHARC	general subsistence halibut fishing not allowed
	Ceremonial	25 halibut per permit
	Educational	25 halibut per permit
	Community Harvest	fishing under Community Harvest Permit not allowed
3A-- Including Chiniak Bay, but excluding Anchorage-Matsu-Kenai and Valdez non-subsistence marine waters areas	SHARC	20 halibut per person per day and in possession
	Ceremonial	25 halibut per permit
	Educational	25 halibut per permit
	Community Harvest	no daily or possession limit
3A--Anchorage-Matsu-Kenai and Valdez non-subsistence marine waters areas	SHARC	general subsistence halibut fishing not allowed
	Ceremonial	25 halibut per permit
	Educational	25 halibut per permit
	Community Harvest	fishing under Community Harvest Permit not allowed
3B	SHARC	20 halibut per person per day and in possession
4A and 4B	SHARC	20 halibut per person per day; no possession limit
4C, 4D, and 4E	SHARC	no daily or possession limit

Table 15 Data for Figure 14 Number of unique vessels by IPHC regulatory area and month group from 2009 through 2015. Data available in Table 15. Source: IPHC logbook data described in Section 4.2.7.

	No. of Unique Vessels		
Location	**Mar-May**	**Jun-Aug**	**Sep-Nov**
2C	1383	1163	889
3A	1745	1479	1144
3B	628	824	566
4A	117	333	152
4B	72	156	82
4CDE	28	252	106

Table 16 Data for Figure 15 Number of unique vessels by IPHC regulatory area and month group from 2009 through 2015. Data available in Table 16. Source: IPHC fish ticket data described in Section 4.2.7.

	No. of Unique Vessels		
Location	**Mar-May**	**Jun-Aug**	**Sep-Nov**
2C	1949	2173	1512
3A	2030	2046	1513
3B	652	927	772
4A	118	399	247
4B	60	205	141
4CDE	52	1387	265

Table 17 Data for Figure 16 Halibut TAC from 2009 through 2017. Data available in Table 17. Commercial catch limit data from IPHC annual reports, available at: http://www.iphc.washington.edu/library/regulations.html.

IPHC Regulatory Area	2009	2010	2011	2012	2013	2014	2015	2016	2017
2C	5,020,000	4,400,000	2,330,000	2,624,000	2,970,000	2,557,440	2,828,000	3,018,000	3,297,000
3A	21,700,000	19,990,000	14,360,000	11,918,000	11,030,000	5,535,460	5,900,000	5,522,000	5,849,000
3B	10,900,000	9,900,000	7,510,000	5,070,000	4,290,000	2,840,000	2,650,000	2,710,000	3,140,000
4A	2,550,000	2,330,000	2,410,000	1,567,000	1,330,000	850,000	1,390,000	1,390,000	1,390,000
4B	1,870,000	2,160,000	2,180,000	1,869,000	1,450,000	1,140,000	1,140,000	1,140,000	1,140,000
4C	1,569,000	1,625,000	1,690,000	1,107,355	859,000	596,600	596,600	733,600	752,000
4D	1,569,000	1,625,000	1,690,000	1,107,355	859,000	596,600	596,600	733,600	752,000
4E	322,000	330,000	340,000	250,290	212,000	91,800	91,800	192,800	196,000

Table 18 Median spawning biomass (millions lb), fishing intensity (based on median Spawning Potential Ratio, where smaller values indicate higher fishing intensity) and exploitable biomass estimates from the 2016 assessment. Reproduced from Table 3 from Stewart and Hicks (2016).

Year	Spawning biomass	Fishing intensity ($F_{XX\%}$)	Exploitable biomass
1996	473.7	48%	647.2
1997	510.9	43%	703.2
1998	504.3	41%	663.1
1999	489.3	39%	659.4
2000	462.1	39%	613.3
2001	427.4	36%	540.0
2002	387.0	32%	476.7
2003	343.1	29%	415.0
2004	305.8	27%	365.2
2005	271.8	25%	321.5
2006	244.2	25%	282.7
2007	223.9	25%	248.1
2008	209.9	25%	221.1
2009	192.4	26%	192.6
2010	185.6	27%	176.0
2011	183.7	32%	166.1
2012	186.5	37%	160.5
2013	194.4	39%	159.8
2014	200.6	45%	161.8
2015	204.6	46%	169.6
2016	207.5	47%	173.7
2017	212.2	NA	181.2