Programmatic Biological Assessment on the Effects of the Fishery Management Plans for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Fisheries and the State of Alaska Parallel Groundfish Fisheries on the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and the Threatened Alaska-breeding Population of the Steller's Eider (*Polysticta stelleri*)

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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 and listed the Alaska-breeding population of the Steller's eider as threatened in 1997. The Sustainable Fisheries Division of NMFS Alaska Region is reinitiating consultation under section 7 of the ESA for the effects of Alaska groundfish fisheries on short-tailed albatross and the Alaska-breeding population of the Steller's eider.

The fisheries analyzed in this biological assessment are the Alaska federally managed groundfish fisheries as authorized by the Fishery Management Plan for Groundfish of the Gulf of Alaska (GOA Groundfish FMP), the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI Groundfish FMP), and the parallel groundfish fisheries in State of Alaska (State) waters.

In this biological assessment, the potential direct and indirect impacts of Federal fisheries and fisheries managed by the State with Federal coordination or oversight are evaluated in the context of the short-tailed albatross and the Alaska-breeding population of the Steller's eider. Cumulative effects of non-Federal actions also are examined.

Effects of the fisheries on short-tailed albatross and the Alaska-breeding population of the Steller's eider can be either direct or indirect effects. Historically, short-tailed albatross have been taken incidental to the GOA and BSAI groundfish fisheries (USFWS 2014). Therefore, the fisheries have a direct effect on short-tailed albatross. Given these historic takes, we determined that the Alaska federally managed fisheries authorized by the GOA and BSAI Groundfish FMPs and parallel groundfish fisheries in State waters are likely to adversely affect the endangered short-tailed albatross.

Short-tailed albatross takes do occur in the hook-and-line fisheries but these takes are relatively rare, especially given the number of hooks set and the amount of observer coverage in the BSAI where the takes have been recorded. All documented short-tailed albatross takes in the GOA and BSAI fisheries have been in the hook-and-line fisheries. Most short-tailed albatross take in Alaska waters has occurred in the BSAI Pacific cod hook-and-line CP fishery. The premise for reinitiating consultation is the probability of observing short-tailed albatross interactions in the BSAI and GOA groundfish fisheries has increased due to increasing observer coverage and increasing short-tailed albatross population size, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross interactions. We can anticipate that 3 short-tailed albatross may be observed and recorded taken in the BSAI and GOA groundfish fisheries each calendar year, on average.

No take of short-tailed albatross has been documented in the BSAI or GOA groundfish fisheries when using trawl gear (AFSC 2014b). However, the possibility of interaction exists and research is ongoing regarding those risks at both the individual and population levels. Although there were no takes recorded when the 2003 biological opinion was rendered, USFWS deemed it necessary to provide incidental take to the trawl fishery based on the likely to adversely affect determination provided to them by NMFS. NMFS does not have any information to suggest that the situation has changed since the 2003 biological opinion determination except that since 2010 observers are more aware of additional sources of seabird mortality from third wire, warp cable, and other interactions.

The fisheries may indirectly affect short-tailed albatross through release of contaminants or through competition for prey. These indirect effects are expected to be discountable. Thus, no indirect effects from the Alaska groundfish fisheries are expected to adversely affect the short-tailed albatross.

There has been only one recorded take of Steller's eider in the BSAI or GOA groundfish fisheries, due to a vessel strike in a marine area thought to be mostly occupied by non-ESA listed birds from Russia. No groundfish fisheries occur in or near the Steller's eider critical habitat. Therefore there are no direct effects from the BSAI or GOA Groundfish FMPs 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 Alaska groundfish fisheries 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 Alaska groundfish fisheries are expected to adversely affect the threatened Alaska-breeding population of the Steller's eider or its critical habitat.

We conclude that:

- The Alaska groundfish fisheries authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters are likely to adversely affect the short-tailed albatross through direct take incidental to fishing operations.
- The Alaska groundfish fisheries authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters are not likely to adversely affect the Alaska-breeding population of the Steller's eider.
- The Alaska groundfish fisheries authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters are not likely to adversely modify the 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 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

Alaska fisheries in Federal waters are managed under fishery management plans (FMPs) authorized by the Magnuson Stevens Fishery Conservation and Management Act (MSA) and adopted by the North Pacific Fishery Management Council (Council). The Council recommends the FMPs and amendments to these FMPs, the Secretary of Commerce approves, disapproves or partially approves these recommendations, and NMFS implements the provisions of the FMPs by Federal regulations at 50 CFR parts 679 and 680. All FMPs must comply with the MSA as well as requirements of other applicable regulations and Federal laws, including the ESA.

The purpose of this biological assessment is to determine if groundfish fisheries managed under the GOA and BSAI Groundfish FMPs adversely affect ESA-listed seabirds or designated critical habitat in the BSAI and 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 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). 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 2014). 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 decided that the available information did not support a species-range listing, and only supported listing the Alaska-breeding population in the Yukon-Kuskokwim Delta, where they were historically in high numbers, but had essentially disappeared (USFWS 2002). 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 determining 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

On September 19, 2000, USFWS received NMFS's request to initiate ESA consultation with the USFWS on the effects of the Alaska groundfish fisheries as managed by the FMPs in their entirety (referred to as a programmatic consultation) on ESA-listed seabirds. The USFWS issued its *Programmatic Biological Opinion on the effects of the Fishery Management Plans (FMPs) for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) Groundfish Fisheries on the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and Threatened Steller's Eider (*Polysticta stelleri*)* (USFWS 2003a) in September 2003. On September 21, 2000, NMFS requested initiation of ESA consultation with the USFWS on the effects of the total allowable catch (TAC)-setting process for the Alaska groundfish fisheries on short-tailed albatross and Steller's eider and its designated critical habitat. The USFWS issued the *Biological Opinion on the Effects of the TAC-Setting Process for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) Groundfish Fisheries to the Endangered Short-tailed Albatross (*Phoebastria albatrus*) and Threatened Steller's Eider (*Polysticta stelleri*)* also in September 2003 (USFWS 2003b).

The USFWS determined (USFWS 2003a, 2003b) that the Alaska groundfish fisheries were not likely to adversely affect spectacled eider or destroy or adversely modify its designated critical habitat. The USFWS determined (USFWS 2003b) that the Alaska groundfish fisheries were not likely to jeopardize the continued existence of either the short-tailed albatross or the Steller's eider, or result in adverse modification of critical habitat for Steller's eider. In the short-tailed albatross incidental take statement (USFWS 2003b), USFWS anticipated up to four short-tailed albatross could be reported taken bi-annually

(every 2 years) as a result of the hook-and-line groundfish fishing activities in the BSAI and GOA areas regulated by NMFS. Additionally, USFWS anticipated that a total of two short-tailed albatross may be reported taken in association with trawl fishing activities in the BSAI and GOA areas regulated by NMFS, over the time period in which this biological opinion remains in effect (i.e., until superseded by a subsequent biological opinion). The incidental take is expected to be in the form of lethal take, due to birds being drowned as a result of encounters with hook-and-line groundfish fishing gear, or taken by collision with trawl gear, including both sonar transducer cables (commonly known as the "third wire") and warp cables (i.e., cables used to pull the trawl net onboard).

3.4 Reinitiation of Section 7 Consultation

The actions analyzed in this biological assessment are the Alaska groundfish fisheries as authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters.

The endangered short-tailed albatross (*P. albatrus*), threatened Steller's eider (*P. stelleri*), and threatened spectacled eider (*Somateria fischeri*) occur in the action area 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 Alaska groundfish fisheries overlap the distribution of these species and critical habitat, NMFS has determined that the groundfish fisheries may affect these species and critical habitat.

In its February 19, 1997, biological opinion amendment, the USFWS determined that groundfish fishing activities by vessels less than or equal to 26 ft LOA, and groundfish fishing activities by vessels using pot gear, are not likely to adversely affect the short-tailed albatross and Steller's eider (USFWS 2003a). NMFS has no new information to the contrary and as a result, this biological assessment focuses on hook-and-line and trawl fisheries greater than 26 ft LOA. The Pacific halibut fishery off Alaska has documented take of short-tailed albatross (1987), and the evaluation of that fishery is being addressed in a separate biological assessment.

In 2003 (USFWS 2003a), the UFSWS concurred with NMFS's determination that the Alaska groundfish fisheries were not likely to adversely affect the spectacled eider or its designated critical habitat based on this species' behavior and distribution relative to fishing activities in the BSAI and GOA. As well, areas designated as critical habitat, where the birds congregate in large numbers, are away from the shelf break, where the majority of fishing effort occurs. The factors that led to that determination have not changed, and NMFS maintains that the groundfish fisheries are not likely to adversely affect the spectacled eider. Therefore, the spectacled eider is not considered further in this biological assessment. This biological assessment evaluates the effects of the Alaska groundfish fisheries on short-tailed albatross and Steller's eider and its designated critical habitat as the best available information indicate the fisheries may affect these species.

NMFS is reinitiating ESA section 7 consultation for the Alaska groundfish fisheries as authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters because increases in the short-tailed albatross population (see Section 5.6) in conjunction with increases in observer coverage and total effort (as estimated by total hooks deployed), increase the likelihood of observing short-tailed albatross interactions in the groundfish fisheries, especially where short-tailed albatross have historically been taken (see Section 5.8). New information is available on the interactions with short-tailed albatross from the North Pacific Groundfish and Halibut Observer Program (Observer Program). The Observer Program monitors fish catch and bycatch and marine mammal and seabird

interactions in Alaska's federally managed groundfish fisheries. For the purposes of this biological assessment, we refer to seabird interactions as seabird bycatch. NMFS has made two major modifications to the Observer Program in recent years that have improved the quality of data in the hook-and-line fisheries where short-tailed albatross take has been observed. First, in 2012 NMFS required vessel owners of hook-and-line CPs named on License Limitation Program (LLP) licenses and endorsed to catch and process Pacific cod at sea with hook-and-line gear in the BSAI to select between two monitoring options: carry two observers so that all catch can be sampled, or carry one observer and use a motion-compensated scale to weigh Pacific cod before it is processed (77 FR 59053, September 26, 2012). The selected monitoring option is required to be used when the vessel is operating in either the BSAI or GOA groundfish fisheries when directed fishing for Pacific cod is open in the BSAI, or while the vessel is fishing for groundfish under the Western Alaska Community Development Quota (CDQ) Program. Second, 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 (LOA) and the commercial halibut sector (77 FR 70062, November 21, 2012).

Given the increase in short-tailed albatross population, there is concern from NMFS, the Council, USFWS, and the industry that exceeding the take level from the biological opinion (USFWS 2003b) could result in an interruption to fishing prior to reinitiating consultation. Therefore, upon request by the USFWS and the Council, NMFS is reinitiating consultation to ensure that the GOA and BSAI groundfish fisheries are not likely to jeopardize the continued existence of short-tailed albatross.

NMFS is reinitiating ESA section 7 consultation for the Alaska groundfish fisheries as authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters for Steller's eider because a take occurred incidental to the groundfish fisheries in 2014, and increases in observer coverage and total effort (as estimated by total hooks deployed), increase the likelihood of observing Steller's eider interactions in the groundfish fisheries.

4.0 Description of the Action and the Action Area

The GOA and BSAI Groundfish FMPs contain conservation and management measures necessary and appropriate to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of fisheries. The Alaska Federal fisheries are managed in the waters of the Exclusive Economic Zone (EEZ; 3 to 200 nautical miles offshore) of Alaska. Parallel groundfish fisheries in 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.

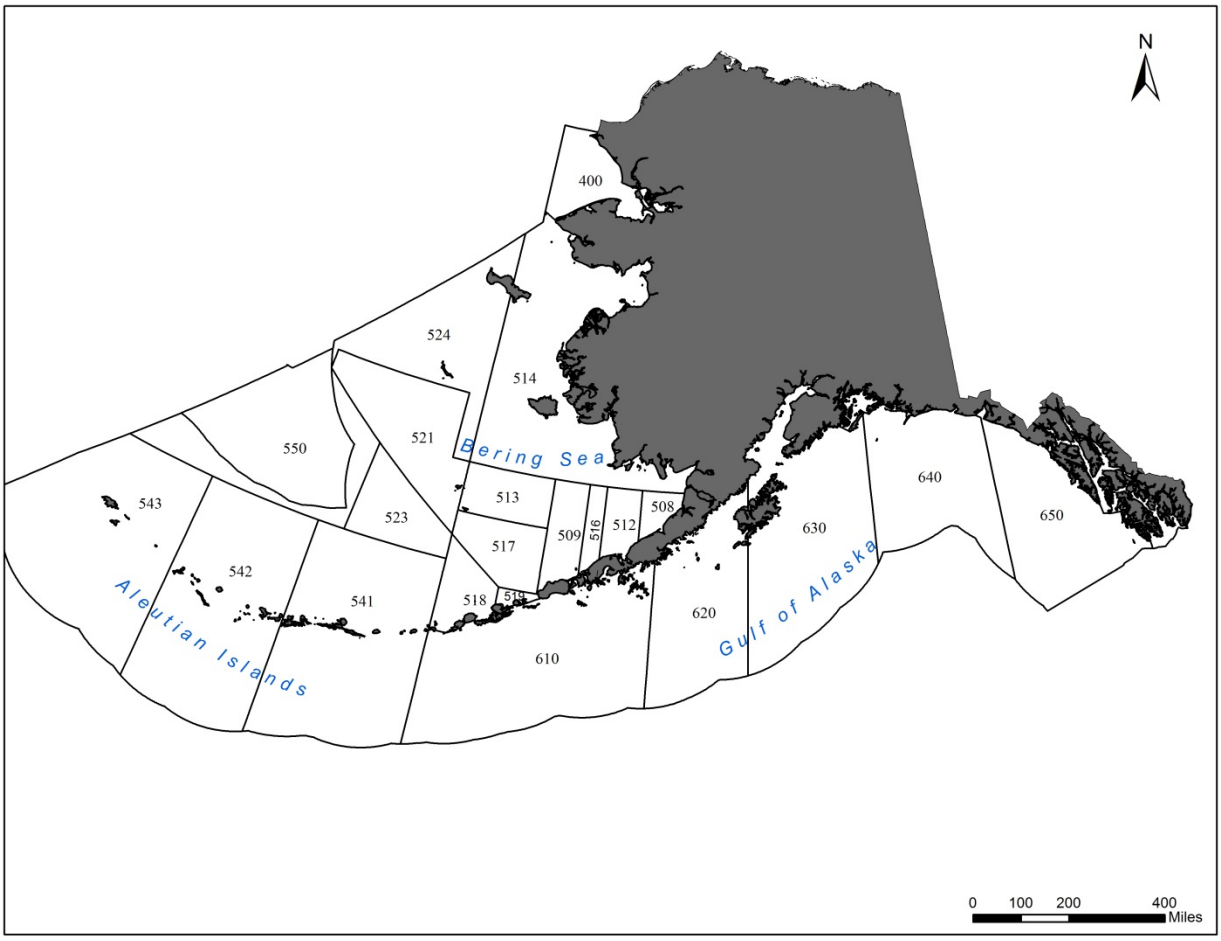

Figure 1 Bering Sea, Aleutian Islands, and Gulf of Alaska reporting areas.

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 402.2.

All direct and indirect effects to short-tailed albatross, Steller's eider, and Steller's eider critical habitat, related to the activities authorized by the BSAI and GOA Groundfish FMPs are believed to occur within these areas, as defined below. The following sections will describe the fisheries managed under the BSAI and GOA Groundfish FMPs, including the gear types, harvest effort, management programs, fishing seasons, fisheries observer coverage, data collection, and seabird bycatch mitigation measures.

4.1 BSAI Groundfish FMP

The BSAI Groundfish FMP establishes the management provisions for groundfish fisheries of the BSAI. This FMP identifies the groundfish species, prohibited species incidentally caught in the Federal groundfish fisheries, and ecosystem components of the BSAI. The BSAI is defined as the eastern Bering Sea and that portion of the North Pacific Ocean adjacent to the Aleutian Islands that is west of 170° W, up to the United States – Russian Convention Line of 1867 (Figure 1).

Fisheries managed under this FMP include walleye pollock (pollock), Pacific cod, sablefish, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, flathead sole, Alaska plaice, other flatfish, Pacific

ocean perch, northern rockfish, shortraker rockfish, rougheye rockfish, other rockfish, Atka mackerel, squid, sharks, skates, sculpins, and octopus (Page 10 in NPFMC 2014a). The acceptable biological catch (ABC), overfishing level (OFL), and total allowable catch (TAC) amounts for each target species or species group for 2015 and 2016 were recommended by the Council, approved by the Secretary of Commerce, and published in the *Federal Register* on March 5, 2015 (80 FR 11919) (Table 1). For additional description of fisheries management policy, fisheries assessment, and implementation of the Federal groundfish fisheries in the BSAI and parallel groundfish fisheries in State waters, see Chapter 2 of the biological opinion on the effects of authorization of the BSAI and GOA Groundfish fisheries (NMFS 2010).

Table 1 Final 2015 overfishing level (OFL), acceptable biological catch (ABC), total allowable catch (TAC), initial TAC (ITAC), and CDQ reserve allocation of groundfish in the BSAI[1] (Amounts are in metric tons) (80 FR 11919, March 5, 2015).

Species	Area	OFL	ABC	TAC	ITAC[2]	CDQ[3]
Pollock[4]	BS	3,330,000	1,637,000	1,310,000	1,179,000	131,000
	AI	36,005	29,659	19,000	17,100	1,900
	Bogoslof	21,200	15,900	100	100	0
Pacific cod[5]	BS	346,000	255,000	240,000	214,320	25,680
	AI	23,400	17,600	9,422	8,414	1,008
Sablefish	BS	1,575	1,333	1,333	567	183
	AI	2,128	1,802	1,802	383	304
Yellowfin sole	BSAI	266,400	248,800	149,000	133,057	15,943
Greenland turbot	BSAI	3,903	3,172	2,648	2,251	n/a
	BS	n/a	2,448	2,448	2,081	262
	AI	n/a	724	200	170	0
Arrowtooth flounder	BSAI	93,856	80,547	22,000	18,700	2,354
Kamchatka flounder	BSAI	10,500	9,000	6,500	5,525	0
Rock sole	BSAI	187,600	181,700	69,250	61,840	7,410
Flathead sole[6]	BSAI	79,419	66,130	24,250	21,655	2,595
Alaska plaice	BSAI	54,000	44,900	18,500	15,725	0
Other flatfish[7]	BSAI	17,700	13,250	3,620	3,077	0
Pacific ocean perch	BSAI	42,558	34,988	32,021	28,250	n/a
	BS	n/a	8,771	8,021	6,818	0
	EAI	n/a	8,312	8,000	7,144	856
	CAI	n/a	7,723	7,000	6,251	749
	WAI	n/a	10,182	9,000	8,037	963
Northern rockfish	BSAI	15,337	12,488	3,250	2,763	0
Rougheye rockfish[8]	BSAI	560	453	349	297	0
	BS/EAI	n/a	149	149	127	0
	CAI/WAI	n/a	304	200	170	0
Shortraker rockfish	BSAI	690	518	250	213	0
Other rockfish[9]	BSAI	1,667	1,250	880	748	0
	BS	n/a	695	325	276	0
	AI	n/a	555	555	472	0
Atka mackerel	BSAI	125,297	106,000	54,500	48,669	5,832
	BS/EAI	n/a	38,492	27,000	24,111	2,889
	CAI	n/a	33,108	17,000	15,181	1,819
	WAI	n/a	34,400	10,500	9,377	1,124
Skates	BSAI	49,575	41,658	25,700	21,845	0
Sculpins	BSAI	52,365	39,725	4,700	3,995	0
Sharks	BSAI	1,363	1,022	125	106	0
Squids	BSAI	2,624	1,970	400	340	0
Octopuses	BSAI	3,452	2,589	400	340	0
TOTAL		4,769,174	2,848,454	2,000,000	1,789,278	197,038

[1] These amounts apply to the entire BSAI management area unless otherwise specified. With the exception of pollock, and for the purpose of these harvest specifications, the BS subarea includes the Bogoslof District.

[2] Except for pollock, the portion of the sablefish TAC allocated to hook-and-line and pot gear, and Amendment 80 species, 15 percent of each TAC is put into a reserve. The ITAC for these species is the remainder of the TAC after the subtraction of these reserves. For pollock and Amendment 80 species, ITAC is the non-CDQ allocation of TAC (see footnotes 3 and 5).

[3] For the Amendment 80 species (Atka mackerel, flathead sole, rock sole, yellowfin sole, Pacific cod, and Aleutian Islands Pacific ocean perch), 10.7 percent of the TAC is reserved for use by CDQ participants (see §§ 679.20(b)(1)(ii)(C) and 679.31). Twenty percent of the sablefish TAC allocated to hook-and-line gear or pot gear, 7.5 percent of the sablefish TAC allocated to trawl gear, and 10.7 percent of the TACs for Bering Sea Greenland turbot and arrowtooth flounder are reserved for use by CDQ participants (see § 679.20(b)(1)(ii)(B) and (D)). Aleutian Islands Greenland turbot, "other flatfish," Alaska plaice, Bering Sea Pacific ocean perch, northern rockfish, shortraker rockfish, rougheye rockfish, "other rockfish," skates, sculpins, sharks, squids, and octopuses are not allocated to the CDQ program.

[4] Under § 679.20(a)(5)(i)(A)(*1*), the annual BS subarea pollock TAC after subtracting first for the CDQ directed fishing allowance (10 percent) and second for the incidental catch allowance (4.0 percent), is further allocated by sector for a pollock directed fishery as follows: inshore - 50 percent; catcher/processor - 40 percent; and motherships - 10 percent. Under § 679.20(a)(5)(iii)(B)(*2*)(*i*) and (*ii*), the annual Aleutian Islands subarea pollock TAC, after subtracting first for the CDQ directed fishing allowance (10 percent) and second for the incidental catch allowance (2,400 metric tons) is allocated to the Aleut Corporation for a pollock directed fishery.
[5] The BS Pacific cod TAC is reduced by 3 percent from the combined BSAI ABC to account for the State of Alaska's (State) guideline harvest level in State waters of the BS subarea. The AI Pacific cod TAC is reduced by 3 percent from the combined BSAI ABC to account for the State guideline harvest level in State waters of the Aleutian Islands subarea.
[6] ''Flathead sole'' includes *Hippoglossoides elassodon* (flathead sole) and *Hippoglossoides robustus* (Bering flounder).
[7] "Other flatfish" includes all flatfish species, except for halibut (a prohibited species), flathead sole, Greenland turbot, rock sole, yellowfin sole, arrowtooth flounder, Kamchatka flounder, and Alaska plaice.
[8] ''Rougheye rockfish'' includes *Sebastes aleutianus* (rougheye) and *Sebastes melanostictus* (blackspotted).
[9] "Other rockfish" includes all Sebastes and Sebastolobus species except for Pacific ocean perch, northern rockfish, dark rockfish, shortraker rockfish, and rougheye rockfish.
Note: Regulatory areas and districts are defined at § 679.2 (BS=Bering Sea subarea, AI=Aleutian Islands subarea, EAI=Eastern Aleutian district, CAI=Central Aleutian district, WAI=Western Aleutian district.)

4.2 GOA Groundfish FMP

The GOA Groundfish FMP establishes the management provisions for groundfish fisheries of the GOA. The FMP identifies the groundfish species, prohibited species incidentally caught in the Federal groundfish fisheries, and ecosystem components. The GOA is defined as the U.S. EEZ of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170° W longitude and Dixon Entrance at 132°40'W longitude (Figure 1).

Fisheries managed under this FMP include pollock, Pacific cod, sablefish; shallow- and deep-water flatfish, rex sole, flathead sole, arrowtooth flounder, Pacific ocean perch, northern rockfish, shortraker and rougheye rockfish, other slope rockfish, pelagic shelf rockfish, demersal shelf rockfish[1], thornyhead rockfish, Atka mackerel, squid, sculpin, sharks, octopus, and skates (Page 10 in NPFMC 2014b).

The ABC, OFL, and TAC amounts for each target species or species group for 2015 and 2016 were recommended by the Council, approved by the Secretary of Commerce, and published in the *Federal Register* on February 25, 2015 (80 FR 10250) (Table 2). For additional description of fisheries management policy, fisheries assessment, and implementation of the Federal groundfish fisheries in the GOA and parallel groundfish fisheries in State waters, see Chapter 2 of the biological opinion on the effects of authorization of the GOA and BSAI Groundfish fisheries (NMFS 2010).

Table 2 Final 2015 ABCs, TACs, and OFLs of groundfish for the GOA. (Values are rounded to the nearest metric ton)

Species	Area[1]	OFL	ABC	TAC
Pollock[2]	Shumagin (610)	n/a	31,634	31,634
	Chirikof (620)	n/a	97,579	97,579
	Kodiak (630)	n/a	52,594	52,594
	WYK (640)	n/a	4,719	4,719
	W/C/WYK (subtotal)	256,545	191,309	186,526
	SEO (650)	16,833	12,625	12,625
	Total	273,378	203,934	199,151
Pacific cod[3]	W	n/a	38,702	27,091
	C	n/a	61,320	45,990
	E	n/a	2,828	2,121
	Total	140,300	102,850	75,202

[1] Management delegated to the State of Alaska.

Sablefish[4]	W	n/a	1,474	1,474
	C	n/a	4,658	4,658
	WYK	n/a	1,708	1,708
	SEO	n/a	2,682	2,682
	E (WYK and SEO) (subtotal)	n/a	4,390	4,390
	Total	12,425	10,522	10,522
Shallow-water flatfish[5]	W	n/a	22,074	13,250
	C	n/a	19,297	19,297
	WYK	n/a	2,209	2,209
	SEO	n/a	625	625
	Total	54,207	44,205	35,381
Deep-water flatfish[6]	W	n/a	301	301
	C	n/a	3,689	3,689
	WYK	n/a	5,474	5,474
	SEO	n/a	3,870	3,870
	Total	15,993	13,334	13,334
Rex sole	W	n/a	1,258	1,258
	C	n/a	5,816	5,816
	WYK	n/a	772	772
	SEO	n/a	1,304	1,304
	Total	11,957	9,150	9,150
Arrowtooth flounder	W	n/a	30,752	14,500
	C	n/a	114,170	75,000
	WYK	n/a	36,771	6,900
	SEO	n/a	11,228	6,900
	Total	226,390,	192,921	103,300
Flathead sole	W	n/a	12,767	8,650
	C	n/a	24,876	15,400
	WYK	n/a	3,535	3,535
	SEO	n/a	171	171
	Total	50,792	41,349	27,756
Pacific ocean perch[7]	W	n/a	2,302	2,302
	C	n/a	15,873	15,873
	WYK	n/a	2,014	2,014
	W/C/WYK subtotal	23,406	20,189	20,189
	SEO	954	823	823
	Total	24,360	21,012	21,012
Northern rockfish[8]	W	n/a	1,226	1,226
	C	n/a	3,772	3,772
	E	n/a	n/a	n/a
	Total	5,961	4,998	4,998
Shortraker rockfish[9]	W	n/a	92	92
	C	n/a	397	397
	E	n/a	834	834

	Total	1,764	1,323	1,323
Dusky rockfish[10]	W	n/a	296	296
	C	n/a	3,336	3,336
	WYK	n/a	1,288	1,288
	SEO	n/a	189	189
	Total	6,246	5,109	5,109
Rougheye and Blackspotted rockfish[11]	W	n/a	115	115
	C	n/a	632	632
	E	n/a	375	375
	Total	1,345	1,122	1,122
Demersal shelf rockfish[12]	SEO	361	225	225
Thornyhead rockfish	W	n/a	235	235
	C	n/a	875	875
	E	n/a	731	731
	Total	2,454	1,841	1,841
Other rockfish[13, 14]	W and C	n/a	1,031	1,031
	WYK	n/a	580	580
	SEO	n/a	2,469	200
	Total	5,347	4,080	1,811
Atka mackerel	GW	6,200	4,700	2,000
Big skate[15]	W	n/a	731	731
	C	n/a	1,257	1,257
	E	n/a	1,267	1,267
	Total	4,340	3,255	3,255
Longnose skate[16]	W	n/a	152	152
	C	n/a	2,090	2,090
	E	n/a	976	976
	Total	4,291	3,218	3,218
Other skates[17]	GW	2,980	2,235	2,235
Sculpins	GW	7,448	5,569	5,569
Sharks	GW	7,986	5,989	5,989
Squids	GW	1,530	1,148	1,148
Octopus	GW	2,009	1,507	1,507
Total		870,064	685,597	536,158

[1] Regulatory areas and districts are defined at § 679.2. (W=Western Gulf of Alaska; C=Central Gulf of Alaska; E=Eastern Gulf of Alaska; WYK=West Yakutat District; SEO=Southeast Outside District; GW=Gulf-wide).

[2] The aggregate pollock ABC for the Western, Central, and West Yakutat Regulatory Areas is apportioned among four statistical areas after deducting 2.5 percent of the ABC for the State's pollock GHL fishery. These apportionments are considered subarea ACLs, rather than ABCs, for specification and reapportionment purposes. The ACLs in Areas 610, 620, and 630 are further divided by season, as detailed in Table 3. In the West Yakutat and Southeast Outside Districts of the Eastern Regulatory Area, pollock is not divided into seasonal allowances.

[3] The annual Pacific cod TAC is apportioned 60 percent to the A season and 40 percent to the B season in the Western and Central Regulatory Areas of the GOA. Pacific cod in the Eastern Regulatory Area is allocated 90 percent for processing by the inshore component and 10 percent for processing by the offshore component. Table 5 lists the final 2015 Pacific cod seasonal apportionments.

[4] Sablefish is allocated to trawl and hook-and-line gear in 2015. Table 7 lists the final 2015 allocations of sablefish TACs.

[5] "Shallow-water flatfish" means flatfish not including "deep-water flatfish," flathead sole, rex sole, or arrowtooth flounder.

[6] "Deep-water flatfish" means Dover sole, Greenland turbot, Kamchatka flounder, and deepsea sole.

[7] "Pacific ocean perch" means *Sebastes alutus*.

[8] "Northern rockfish" means *Sebastes polyspinis*. For management purposes the 2 metric tons apportionment of ABC to the WYK District of the Eastern Gulf of Alaska has been included in the other rockfish species group.
[9] "Shortraker rockfish" means *Sebastes borealis*.
[10] "Dusky rockfish" means *Sebastes variabilis*.
[11] "Rougheye rockfish" means *Sebastes aleutianus* (rougheye) and *Sebastes melanostictus* (blackspotted).
[12] "Demersal shelf rockfish" means *Sebastes pinniger* (canary), *S. nebulosus* (china), *S. caurinus* (copper), *S. maliger* (quillback), *S. helvomaculatus* (rosethorn), *S. nigrocinctus* (tiger), and *S. ruberrimus* (yelloweye).
[13] "Other rockfish" means *Sebastes aurora* (aurora), *S. melanostomus* (blackgill), *S. paucispinis* (bocaccio), *S. goodei* (chilipepper), *S. crameri* (darkblotch), *S. elongatus* (greenstriped), *S. variegatus* (harlequin), *S. wilsoni* (pygmy), *S. babcocki* (redbanded), *S. proriger* (redstripe), *S. zacentrus* (sharpchin), *S. jordani* (shortbelly), *S. brevispinis* (silvergrey), *S. diploproa* (splitnose), *S. saxicola* (stripetail), *S. miniatus* (vermilion), *S. reedi* (yellowmouth), *S. entomelas* (widow), and *S. flavidus* (yellowtail). In the Eastern GOA only, other rockfish also includes northern rockfish, *S. polyspinis*.
[14] "Other rockfish" in the Western and Central Regulatory Areas and in the West Yakutat District means other rockfish and demersal shelf rockfish. The "other rockfish" species group in the SEO District only includes other rockfish.
[15] "Big skate" means *Raja binoculata*.
[16] "Longnose skate" means *Raja rhina*.
[17] "Other skates" means *Bathyraja* spp.

4.3 Groundfish Fisheries Management

Groundfish fisheries in the EEZ off Alaska are managed using a system where TAC amounts are established for each gear-species complex, and catch is monitored inseason to determine fishery closure dates. TACs are established annually through the Council harvest specification process, described in NPFMC (2014a, b). TAC is set either at ABC levels, or below. NMFS manages the fisheries off Alaska based on TAC amounts for target species and PSC amounts for species that may not be retained. The TAC and PSC amounts are further subdivided by gear type, area, and season. Fisheries monitoring and inseason decision-making is conducted using a combination of observer data, dealer landing reports, and at-sea production reports. If the TAC is caught before the end of the year, all retention of the FMP groundfish species is prohibited. If the ABC is taken and the trajectory of catch indicates the OFL may be approached, additional closures are imposed. (NPFMC 2014a, b)

The types of vessels included in the groundfish fisheries were summarized in Cahalan et al. (2014). In general, vessels participating in Alaska groundfish fisheries can be divided into two broad categories: vessels that catch fish versus vessels that only process or transport fish. Vessels that catch fish include catcher/processors (CPs), which catch and process fish while at sea, and catcher vessels (CVs), which deliver their catch to either a shoreside processing facility or a vessel with the ability to process fish (including CPs). The types of vessels that only process or transport fish include motherships, stationary floating processors, and tender vessels. Motherships are large processing vessels (generally greater than 200 feet in length) that, unlike a stationary floating processor, are not tied to a single geographic location. Both motherships and stationary floating processors receive and process unsorted catch from CVs. Tender vessels deliver catch received from CVs to shoreside processing facilities.

4.3.1 Groundfish Gear Types and Harvest Effort

Authorized gear types for groundfish in the GOA and BSAI are pelagic and non-pelagic trawls, hook-and-line (demersal), pots, jigs, and other gear as defined in regulations at 50 CFR 679.2. Table 3 shows the number of vessels using each gear type from the last 6 years, 2009 through 2014. This year series is used for the analyses in this section because it represents the most reliable data and provides a historic range on the use of vessels in the groundfish fisheries. The highest vessel numbers using each gear type were for hook-and-line gear in the GOA. From 2009 through 2014, the number of hook-and-line vessels decreased in the BSAI and GOA. The number of trawl and pot gear vessels remained relatively consistent in the BSAI and decreased slightly in the GOA. The number of vessels using jig gear in the

BSAI fluctuated but remained low and relatively constant. Vessels using jig gear in the GOA also fluctuated but overall an increase of nearly 50 vessels occurred from 2009 through 2014.

Table 3 Number of vessels using each gear type in the BSAI and GOA Groundfish FMP fisheries, from 2009 through 2014.

	2009	2010	2011	2012	2013	2014
Hook-and-Line Gear (No. Vessels)						
BSAI	73	66	67	64	63	48
GOA	398	398	377	367	329	328
TOTAL	432	421	406	404	372	357
Trawl Gear (No. Vessels)						
BSAI	146	138	141	146	136	134
GOA	90	85	86	88	84	81
TOTAL	186	178	178	183	178	180
Pot Gear (No. Vessels)						
BSAI	55	54	58	57	62	59
GOA	119	107	146	132	107	99
TOTAL	158	144	186	174	151	149
Jig Gear (No. Vessels)						
BSAI	3	7	11	6	6	3
GOA	169	190	235	247	167	218
TOTAL	170	193	239	251	172	220

The amount of groundfish harvested by each of the gear types in the Bering Sea, Aleutian Islands, and GOA are found in Table 4, Table 5, and Table 6, respectively. Groundfish harvest (metric tons) in the Bering Sea, Aleutian Islands, and GOA has fluctuated year to year (2008 through 2014) but most gear sectors have maintained relatively consistent harvest levels. From 2008 through 2014, total groundfish harvest (metric tons) in the BSAI was eight times greater than the GOA (Table 4, Table 5, and Table 6).

Total groundfish harvest (metric tons) in the Bering Sea ranged from 1,184,076 to 1,805,863 metric tons from 2008 through 2014 (Table 4). In the Bering Sea, the greatest amount (metric tons) of groundfish was harvested by the pelagic trawl catcher vessels (CVs) (Table 4).

Table 4 Amount (metric tons) of groundfish caught in the Bering Sea by each BSAI Groundfish FMP gear sector from 2008 through 2014.

Bering Sea	2008	2009	2010	2011	2012	2013	2014
Hook-And-Line Catcher/Processors	111,075	117,211	101,178	144,049	157,413	152,935	158,003
Hook-And-Line Catcher Vessels	1,895	862	667	786	836	1,856	3,181
Non-Pelagic Trawl Catcher/Processors	291,196	239,830	263,746	310,593	314,270	339,270	337,368
Non-Pelagic Trawl Catcher Vessels	24,281	15,989	15,840	37,181	49,397	56,246	50,094
Pelagic Trawl Catcher/Processors	451,923	364,246	374,073	559,104	561,064	582,932	584,216
Pelagic Trawl Catcher Vessels	528,524	445,938	429,389	639,864	641,659	665,288	673,002
Total	1,408,895	1,184,076	1,184,894	1,691,577	1,724,639	1,798,526	1,805,863

Total groundfish harvest (metric tons) in the Aleutian Islands ranged from 77,555 – 144,177 metric tons during 2008-2014 (Table 5). In the Aleutian Islands, the greatest amount (metric tons) of groundfish was harvested by the non-pelagic trawl catcher/processors (CPs) (Table 5).

Table 5 Amount (metric tons) of groundfish caught in the Aleutian Islands by each BSAI Groundfish FMP gear sector from 2008 through 2014.

Aleutian Islands	2008	2009	2010	2011	2012	2013	2014
Hook-And-Line Catcher/Processors	6,916	8,067	10,528	2,172	4,577	2,962	768
Hook-And-Line Catcher Vessels	1,175	503	659	645	679	883	1,103
Non-Pelagic Trawl Catcher/Processors	87,317	108,639	117,079	81,048	79,287	66,471	66,458
Non-Pelagic Trawl Catcher Vessels	15,740	18,383	15,861	12,340	14,065	9,397	9,227
Pelagic Trawl Catcher/Processors	0	0	50	0	0	0	0
Pelagic Trawl Catcher Vessels	418	292	0	0	0	0	0
Total	111,567	135,886	144,177	96,204	98,608	79,713	77,555

Total groundfish harvest (metric tons) in the GOA ranged from 157,144 to 277,331 metric tons from 2008 through 2014 (Table 6). In the GOA, the greatest amount (metric tons) of groundfish was harvested by the pelagic trawl CVs (Table 6).

Table 6 Amount (metric tons) of groundfish caught in the Gulf of Alaska by each GOA Groundfish FMP gear sector from 2008 through 2014.

Gulf of Alaska	2008	2009	2010	2011	2012	2013	2014
Hook-And-Line Catcher/Processors	7,221	7,424	10,742	10,094	6,063	4,576	7,567
Hook-And-Line Catcher Vessels	21,346	23,002	20,042	21,213	23,772	29,154	24,127
Non-Pelagic Trawl Catcher/Processors	29,665	34,262	33,813	35,537	30,730	32,963	46,978
Non-Pelagic Trawl Catcher Vessels	64,282	51,020	53,017	53,622	49,221	58,235	62,905
Pelagic Trawl Catcher/Processors	822	1,347	1,316	1,053	1,458	0	1,875
Pelagic Trawl Catcher Vessels	50,201	40,089	76,457	74,222	99,967	85,764	133,879
Total	173,538	157,144	195,387	195,741	211,211	210,693	277,331

Hook-and-line groundfish harvest (metric tons) was greater in the CP sector than the CV sector in the BSAI (Table 4, Table 5); however, the opposite was seen in the GOA (Table 6). The total number of hook-and-line vessels (CVs and CPs) was greater in the GOA than the BSAI (Table 3); however, the total amount (metric tons) of groundfish harvested was greater in the BSAI than the GOA (Table 4, Table 5, and Table 6).

Non-pelagic trawl groundfish harvest (metric tons) was greater in the CP sector than the CV sector in the BSAI (Table 4, Table 5); however, harvest (metric tons) was greater in the CV sector than the CP sector in the GOA (Table 6). Pelagic trawl groundfish harvest (metric tons) was greater in the CV sector than the CP sector in the BSAI and GOA (Table 4, Table 5, Table 6).

Hook-and-line and trawl gear will be discussed in more detail in Sections 5.9.1.1 and 5.9.1.2, respectively.

4.3.2 Management Programs

Federal fisheries in Alaska are managed under a variety of programs including open-access fisheries and Limited Access Privilege Programs (LAPPs). Open access fisheries are open to anyone with a Federal Fishing Permit, and these fisheries can be targeted until the entire quota is obtained. LAPPs are programs that issue Federal permits that represent a portion of the TAC that allow for exclusive use by a person, thereby limiting the number of participants in some fisheries (AFSC 2011). The Western Alaska CDQ Program – for numerous groundfish species, American Fisheries Act (AFA) – for Bering Sea pollock, and Amendment 80 to the BSAI Groundfish FMP – for BSAI non-pollock species are examples of LAPPs.

The Western Alaska CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The AFA allowed for the creation of cooperative agreements for vessels targeting Bering Sea pollock, and Amendment 80 to the BSAI Groundfish FMP facilitated the formation of cooperatives in the non-AFA trawl CP sector. A recent summary of the history of the BSAI and GOA Groundfish FMPs can be found in the Alaska Groundfish Harvest Specifications Supplementary Information Report (NMFS 2015).

4.3.3 Seasons

Fishing for groundfish in the GOA and BSAI is authorized from January 1 through December 31, subject to the other provisions and exceptions described below and specified at 50 CFR 679.23. Fishing for groundfish with trawl gear in the GOA and BSAI is prohibited from January 1 through January 20.

GOA Groundfish Seasons

Rockfish

Directed fishing for rockfish with trawl gear in the GOA is authorized from the first day of the third quarterly reporting period of a fishing year through December 31, subject to other provisions of 50 CFR part 679.

Pollock

Subject to other provisions of 50 CFR part 679, directed fishing for pollock in the Western and Central Regulatory Areas is authorized only during the following four seasons:

A season. January 20 through March 10;
B season. March 10 through May 31;
C season. August 25 through October 1; and
D season. October 1 through November 1.

Pacific cod

Subject to other provisions of 50 CFR part 679, directed fishing for Pacific cod with hook-and-line or pot gear in the Western and Central GOA Regulatory Areas is authorized only during the following two seasons:

A season. January 1 through June 10; and
B season. September 1 through December 31.

Subject to other provisions of 50 CFR part 679, directed fishing for Pacific cod with trawl gear in the Western and Central Regulatory Areas is authorized only during the following two seasons:

A season. January 20 through June 10; and
B season. September 1 through November 1.

Subject to other provisions of 50 CFR part 679, directed fishing for Pacific cod with jig gear in the Western and Central GOA Regulatory Areas is authorized only during the following two seasons:

A season. January 1 through June 10 or when the jig A season allocation is reached, whichever occurs first;
B season. June 10 through December 31 or when the jig B season allocation is reached, whichever occurs first.

Directed fishing for Pacific cod in the Western and Central Regulatory Areas is prohibited.

BSAI Groundfish Seasons

Arrowtooth flounder, Kamchatka flounder, and Greenland turbot

Directed fishing for arrowtooth flounder, Kamchatka flounder, and Greenland turbot in the BSAI is authorized from May 1 through December 31, subject to the other provisions of 50 CFR part 679.

Pollock

Subject to other provisions of 50 CFR part 679, directed fishing for pollock by vessels catching pollock for processing by the inshore component, CPs in the offshore component, and motherships in the offshore component in the Bering Sea subarea, directed fishing for pollock in the Aleutian Islands directed pollock fishery, or directed fishing for CDQ pollock in the BSAI is authorized only during the following two seasons:

A season. January 20 through June 10; and

B season. June 10 through November 1.

Atka mackerel

Subject to other provisions of 50 CFR part 679, directed fishing for Atka mackerel with trawl gear in the BSAI is authorized only during the following two seasons:

A season. January 20 through June 10; and

B season. June 10 through December 31.

CDQ fishing seasons

Fishing for CDQ sablefish with fixed gear under an approved CDQ allocation may begin on the effective date of the allocation, except that it may occur only during the individual fishing quota (IFQ) fishing season specified in § 679.23(g)(1).

Fishing for groundfish CDQ species, other than CDQ pollock; hook-and-line, pot, jig, or trawl CDQ Pacific cod; trawl CDQ Atka mackerel; and fixed gear CDQ sablefish under subpart C of this 50 CFR, is authorized from January 1 through the end of each fishing year, except that fishing for groundfish with trawl gear in the GOA and BSAI is prohibited from January 1 through January 20.

Directed fishing for Pacific cod

Subject to other provisions of 50 CFR part 679, directed fishing for CDQ and non-CDQ Pacific cod with vessels equal to or greater than 60 ft (18.3 m) LOA using hook-and-line gear is authorized only during the following two seasons:

A season. January 1 through June 10; and

B season. June 10 through December 31.

Subject to other provisions of 50 CFR part 679, directed fishing for CDQ and non-CDQ Pacific cod with trawl gear in the BSAI is authorized only during the following three seasons:

A season. January 20 through April 1;

B season. April 1 through June 10; and

C season—

CVs and AFA CPs. June 10 through November 1.

Amendment 80 and CDQ. June 10 through December 31.

Subject to other provisions of 50 CFR part 679, non-CDQ directed fishing for Pacific cod with vessels equal to or greater than 60 ft (18.3 m) LOA using pot gear in the BSAI is authorized only during the following two seasons:

A season. January 1 through June 10; and
B season. September 1 through December 31.

Subject to other provisions of 50 CFR part 679, directed fishing for CDQ and non-CDQ Pacific cod with jig gear is authorized only during the following three seasons:
A season. January 1 through April 30;
B season. April 30 through August 31;
C season. August 31 through December 31.

IFQ sablefish
(1) Directed fishing for sablefish using fixed gear in any IFQ regulatory area may be conducted in any fishing year during the period specified by the Regional Administrator and announced by publication in the *Federal Register*. The Regional Administrator will take into account the opening date of the halibut season when determining the opening date for sablefish for the purposes of reducing bycatch and regulatory discards between the two fisheries.
(2) Catches of sablefish by fixed gear during other periods may be retained up to the amounts provided for by the directed fishing standards specified at § 679.20 when made by an individual aboard the vessel who has a valid IFQ permit and unused IFQ in the account on which the permit was issued.
(3) Catches of sablefish in excess of the maximum retainable bycatch amounts and catches made without IFQ must be treated in the same manner as prohibited species as defined at § 679.21(b).

4.3.4 Observer Coverage

The Observer Program has had a vital role in the management of North Pacific groundfish fisheries since the program started over 25 years ago. The information collected by NMFS-certified observers (observers) provides scientific information for managing the groundfish fisheries and minimizing bycatch. High quality observer data is the cornerstone of Alaska groundfish fisheries management. According to the latest North Pacific Groundfish and Halibut Observer Program Annual Report (NMFS 2014b), 467 observers were trained and equipped for deployment in 2013 on a variety of commercial fishing vessels and provided over 3,500 partial coverage observer days and over 37,000 full coverage observer days.

The Observer Program monitors fish, bycatch, and marine mammal and seabird interactions in Alaska's federally managed groundfish fisheries and parallel groundfish fisheries in State waters. The Observer Program also monitors catch of halibut allocated under the IFQ and CDQ Program. 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.

Since the 2003 biological opinion (USFWS 2003b), observer coverage monitoring seabird interactions has greatly expanded in the BSAI and GOA. As described later in this document, seabird interactions occur primarily in the hook-and-line fisheries, and many of the recent changes in observer coverage

have improved monitoring specifically in the hook-and-line fisheries. Most of the key regulatory changes resulting in increased observer coverage have been implemented over the past several years. In 2011, Amendment 91 to the BSAI Groundfish FMP changed the NMFS Alaska Region's Catch Accounting System (CAS) by establishing regulations that facilitate enforcement of sampling. In part, this amendment required at-sea observers on all vessels fishing for pollock in the Bering Sea and at shoreside processors receiving Bering Sea pollock deliveries. CAS data inputs were also changed in 2012 (77 FR 59053, September 26, 2012) when regulations requiring increased observer coverage or use of flow scales were implemented for the Bering Sea hook-and-line CP fleet. CAS data inputs were changed again in 2013 when tender operators were allowed to electronically record catch information when a CV makes a delivery. (Cahalan et al. 2014)

The most substantial changes to the structure of the Observer Program took effect in January 2013 to improve observer data quality and to more equitably distribute the industry's observer coverage costs including observer coverage on vessels less than 60 ft LOA for the first time (77 FR 70062, November 21, 2012). These changes increase the statistical reliability of data collected by the program and expand observer coverage to previously unobserved fisheries. Changes to the Observer Program implemented in 2013 allow NMFS to determine when and where to deploy observers according to management and conservation needs. 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. All vessels and processors in the groundfish and halibut fisheries off Alaska are in one of two observer coverage categories: 1) a full coverage category, or 2) a partial coverage category.

Vessels in the full coverage category include CPs (with limited exceptions); motherships; CVs while participating in AFA or CDQ pollock fisheries; CVs while participating in CDQ groundfish fisheries (except: sablefish; and pot or jig gear CVs); CVs while participating in the Central GOA Rockfish Program; and inshore processors when receiving or processing Bering Sea pollock. Vessels and processors in the full coverage category obtain observers by contracting directly with observer provider companies. All CPs are now required to have 100 percent observer coverage, which is an increase relative to the program described in the biological opinion on the effects of the authorization of the GOA and BSAI Groundfish FMPs (NMFS 2010). On vessels in the full coverage category, observers monitor all trips and typically sample between 50 percent and 100 percent of the individual hauls (Cahalen 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 (Cahalen et al. 2014).

Partial coverage vessels include CVs designated on a Federal Fisheries Permit when directed fishing for groundfish in federally managed or parallel fisheries, except those in the full coverage category; CVs when fishing for halibut IFQ or CDQ; CVs when fishing for sablefish IFQ or fixed gear sablefish CDQ; and shoreside or stationary floating processors, except those in the full coverage category. In addition, the following CPs may be included in the partial observer coverage category: 1) CPs less than 60 ft. LOA with a history of CP and CV activity in a single year from January 1, 2003, through January 1, 2010; 2) any CP with an average daily groundfish production of less than 5,000 pounds round weight equivalent in the most recent full calendar year of operation from January 1, 2003, to January 1, 2010; or 3) CPs that processed no more than one metric ton round weight of groundfish on any day (up to a maximum of 365 metric tons per year) in the previous calendar year. The owner of a CP that falls under number 1 or 2 may make a one-time election of partial observer coverage at least 30 days before the first fishing trip with the vessel under the new Observer Program. The owner of a CP that falls under number 3 may elect partial observer coverage in any year that follows a year when the vessel processed no more than one metric ton of groundfish on any day in that previous year.

The ADP is used to assign observers to collect independent information from fishing operations under the BSAI and GOA groundfish FMPs and the North Pacific Halibut Act of 1982. The 2015 ADP (NMFS 2014a) is available on the NMFS Alaska Region web site.[2] 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.

Starting in 2015, all vessels in the partial coverage category are placed into two pools with differing requirements. These pools and requirements are as follows:

No Selection pool. This category applies to all vessels fishing with hook-and-line or pot gear that are less than 40 ft LOA; all CVs of any length fishing with jig, handline, troll, and dinglebar troll gear; and any vessels that are conditionally released due to life raft capacity. In addition, in 2015, vessels voluntarily participating in NMFS's Electronic Monitoring Study will be in the no selection pool. Inclusion in this pool is re-evaluated each year in the ADP and may change in the future.

Trip Selection pool. This category applies to all CVs of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 40 ft LOA. Each fall, owners of vessels placed in this pool receive a letter that lists their vessels assigned to this pool and describes how to access and log trips into Observer Declare and Deploy System (ODDS). Vessel owners or operators whose vessels are in this selection pool are required to log each fishing trip into ODDS. On logging a trip, vessel owners or operators will be immediately informed if the trip has been randomly selected for observer coverage. If the logged fishing trip is selected, then the vessel must take an observer on that trip. The observer will be provided by a NMFS contractor. Vessel owners or operators in this pool must log fishing trips at least 72 hours before anticipated departure.

In Alaska, electronic monitoring (EM) technologies are used for compliance monitoring. There are two types of EM in use: vessel monitoring system (VMS) and camera-based systems. Cahalan et al. (2014) stated that "As of 2010, about one-third of the vessels that participate in the groundfish, crab, and halibut fisheries in Alaska are required to carry the VMS (NPFMC 2012)." Based on the 2014 data, that proportion remains unchanged.

4.3.5 Data Collection

Total catch estimates in the groundfish fisheries off Alaska are generated by the NMFS Alaska Region and are used to manage about 600 separate groundfish quotas and PSC limits in the BSAI and GOA. Each year, quotas are established in the CAS that match the annual harvest specification tables. The system uses information from multiple data sources to provide an estimate of total groundfish catch, including at-sea discards, and estimates of PSC and other non-groundfish bycatch. 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.

An important aspect of the CAS is to provide near real-time delivery of accurate data for inseason management decisions. To meet this objective, data from industry is reported through the Interagency

[2] http://alaskafisheries.noaa.gov/sustainablefisheries/observers/final2015adp.pdf

Electronic Reporting System (IERS) and is fed into the NMFS database every hour. IERS is implemented by NMFS, Alaska Department of Fish and Game (ADF&G), and the International Pacific Halibut Commission (IPHC). A component of IERS is a web-based interface known as eLandings. Data from observers is sent to the Alaska Fisheries Science Center (AFSC) electronically and is transmitted into the CAS every night. (Cahalan et al. 2014)

A detailed description of the current catch estimation methods was published by Cahalan et al. (2014) in NOAA Technical memorandum NMFS-AFSC-286. Cahalan et al. (2014) updates the description of the CAS procedures that were published by Cahalan et al. (2010) in NOAA technical memorandum NMFS-AFSC-205.

NMFS has estimated seabird bycatch using CAS in the BSAI and GOA groundfish fisheries since 2007 and in the halibut fisheries since 2013 (Fitzgerald et al. 2013; AFSC 2014b). Seabird estimates are based on at-sea sampling by observers (AFSC 2015). In the CAS, observer data are used to create seabird bycatch rates (a ratio of the estimated bycatch to the estimated total catch in sampled hauls). 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. A more detailed explanation of these methods is in Section 5.9.1.

4.3.6 Seabird Bycatch Mitigation in the Alaska Groundfish Fisheries

Seabird bycatch in the Alaskan groundfish fisheries occurs mainly in the hook-and-line fisheries (AFSC 2014b), and the history of hook-and-line seabird avoidance measures in the Alaska groundfish fisheries is outlined below:

> May 1997 — Groundfish hook-and-line fisheries were required to conduct fishing operations in a specified manner, and to employ specified bird avoidance techniques to reduce seabird bycatch and incidental seabird mortality (62 FR 23176, April 29, 1997). A wide variety of measures were allowed under this initial requirement.
>
> April 1998 — Pacific halibut fisheries in U.S. Convention waters off Alaska were required to conduct fishing operations in a specified manner and to employ specified measures intended to reduce seabird bycatch and incidental seabird mortality. This rule also amended the regulations requiring seabird bycatch avoidance measures in the hook-and-line groundfish fisheries of the BSAI and the GOA to exempt small vessels from some of the requirements and to clarify one of 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).
>
> 1999-2000 — Field studies were undertaken led by the University of Washington Sea Grant Program and supported by the AFSC and industry. These were the largest mitigation studies ever conducted (and remain so to date).
>
> February 2004 — Seabird avoidance measures were revised for the Alaska hook-and-line groundfish and halibut 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 hook-and-line groundfish and halibut fisheries in International Pacific Halibut Commission (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 § 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 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 (0 to 200 nm); IFQ sablefish in U.S. EEZ waters off Alaska (3 to 200 nm); waters of the State of Alaska (0 to 3 nm); and groundfish (except IFQ sablefish) with hook-and-line gear in the U.S. EEZ waters off Alaska (3 to 200 nm). Other than noted above, vessel operators using hook-and-line gear and fishing for groundfish in waters of the State of Alaska must refer to seabird avoidance measures in State regulations (see 5AAC 28.055). 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.

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 EEZ (see the regulations at 50 CFR part 679.24(e)(4)(ii), (e)(4)(iii), and (e)(4)(iv) for the specific standards). 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 2). The three exception areas 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.).

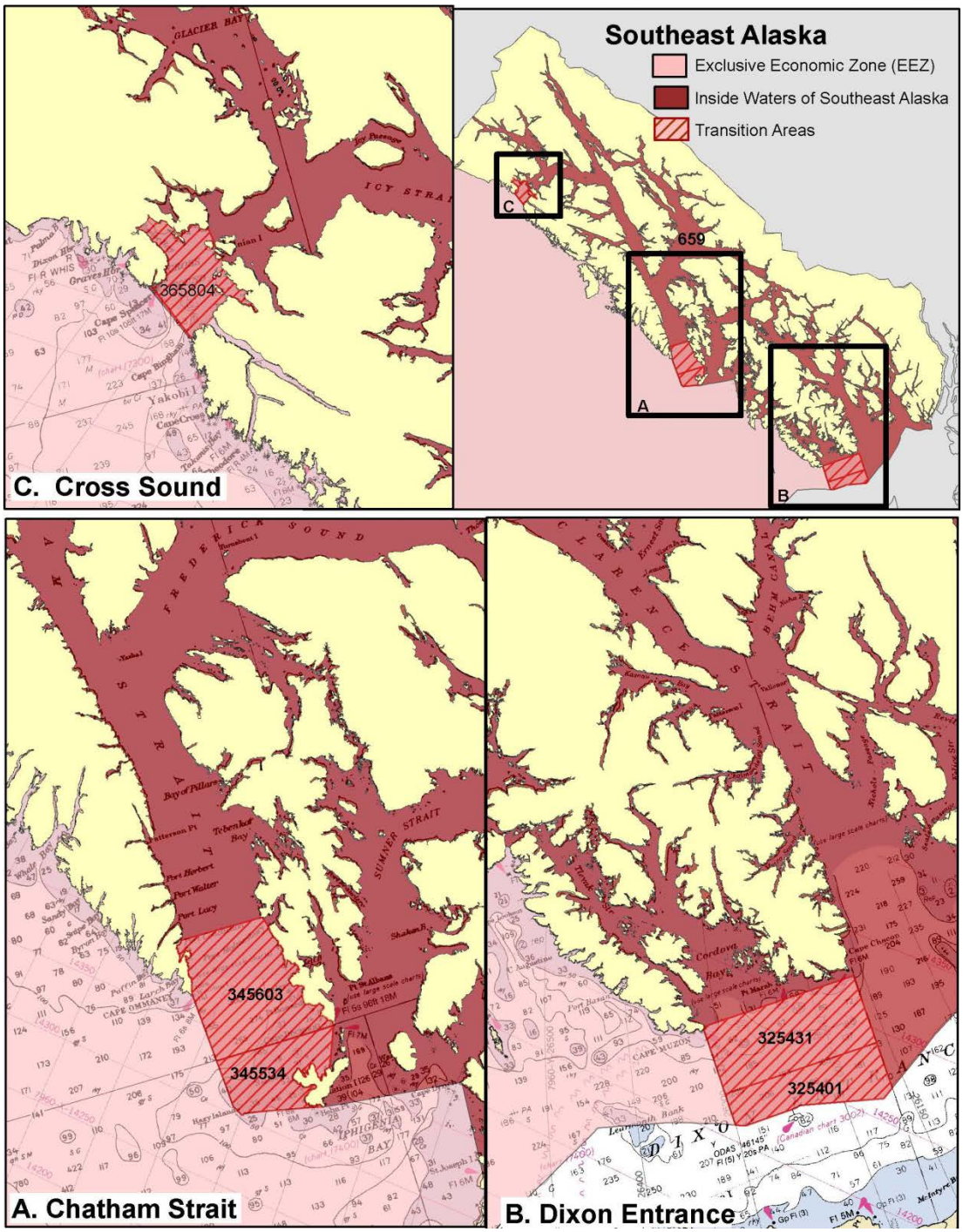

Figure 2 Transition areas for A) Chatham Strait, B) Dixon Entrance, and C) Cross Sound. In these transition areas, as in EEZ waters, seabird avoidance gear and standards are required. Available at: http://alaskafisheries.noaa.gov/protectedresources/seabirds/ea/figure1_2.pdf.

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 7 (below) and the regulations at 50 CFR part 679.24(e)(2) for more specific requirements.

Table 7 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 regulations at 50 CFR part 679.24(e)(2)(v) for more specific requirements.

If a short-tailed albatross is hooked and there is a fisheries observer 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. If there is not an observer 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), regulations continue to require that every reasonable effort be made to ensure that short-tailed albatross brought on board alive are released alive. The USFWS biological opinion (2003b) states that birds should be released on site if they meet ALL of the following criteria:

Bird can stand and walk using both feet.
Bird can flap both wings and there is no apparent wing droop.
Bird is alert, active, holds its head up and reacts to stimuli.
Bird is not bleeding freely.
Wing and tail feathers have not been lost and are in good condition.
Bird is waterproof (water beads up on feathers).

If the short-tailed albatross does not meet all of these criteria, then Appendix 2 of the USFWS biological opinion (USFWS 2003b) provides details on how to care for the bird.

4.4 ESA-listed Species in the Action Area

4.4.1 Species Consulted on Previously in the BSAI and GOA

NMFS has previously consulted on the effects of the BSAI and GOA groundfish fisheries on the ESA-listed species listed in Table 8.

Table 8 Most recent BSAI and GOA Groundfish FMP consultations for ESA-listed species.

Species	Scientific name	ESA status	Consultation type	Determination
Bowhead Whale	Balaena mysticetus	Endangered	Informal	Not likely to adversely affect
Sei Whale	Balaenoptera borealis	Endangered	Informal	Not likely to adversely affect
Blue Whale	Balaenoptera musculus	Endangered	Informal	Not likely to adversely affect
Cook Inlet Beluga Whale	Delphinapterus leucas	Endangered	Informal	Not likely to adversely affect
Olive Ridley Sea Turtle	Lepidochelys olivacea	Threatened and Endangered*	Informal	Not likely to adversely affect
Loggerhead Sea Turtle	Caretta caretta	Threatened and Endangered*	Informal	Not likely to adversely affect
Green Sea Turtle	Chelonia mydas	Threatened and Endangered*	Informal	Not likely to adversely affect
Leatherback Sea Turtle	Dermochelys coriacea	Endangered	Informal	Not likely to adversely affect
Green Sturgeon	Acipenser medirostris	Threatened and Species of Concern*	Informal	Not likely to adversely affect
Northern Sea Otter	Enhydra lutris	Threatened	Informal	Not likely to adversely affect
Northern Right Whale	Balaena glacialis	Endangered	Formal	Not likely to adversely affect, no adverse modification of critical habitat
Fin Whale	Balaenoptera physalus	Endangered	Formal	Not likely to jeopardize
Humpback Whale, Central North Pacific and Western North Pacific	Megaptera novaeangliae	Endangered	Formal	Not likely to jeopardize
Sperm Whale	Physeter macrocephalus	Endangered	Formal	Not likely to jeopardize
Steller Sea Lion, Western Distinct Population Segment	Eumetopias jubatus	Endangered	Formal	Not likely to jeopardize, not likely adversely modify critical habitat
Short-tailed Albatross	Phoebastria albatrus	Endangered	Formal	Not likely to jeopardize
Steller's Eider	Polysticta stelleri	Threatened	Formal	Not likely to jeopardize, not likely to adversely modify critical habitat

* ESA status dependent on population or species range.

4.4.2 **Species Consulted on in this Biological Assessment**

NMFS is reinitiating ESA section 7 consultation for the Alaska groundfish fisheries as authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters.

As mentioned above, NMFS has made two major modifications to the Observer Program in recent years that have improved the quality of data in the hook-and-line fisheries where short-tailed albatross take

has been observed (77 FR 59053, September 26, 2012 and 77 FR 70062, November 21, 2012). NMFS is reinitiating consultation because increases in the short-tailed albatross population (see Section 5.6) in conjunction with increases in observer coverage and total effort (as estimated by total hooks deployed), increase the likelihood of observing short-tailed albatross interactions in the groundfish fisheries, especially where short-tailed albatross have historically been taken (see Section 5.8). Given the increase in short-tailed albatross population, there is concern from NMFS, the Council, USFWS, and the industry that exceeding the take level from the biological opinion (USFWS 2003b) could result in an interruption to fishing prior to reinitiating consultation. Therefore, upon request by the USFWS and the Council, NMFS is reinitiating consultation to ensure that the GOA and BSAI groundfish fisheries are not likely to jeopardize the continued existence of short-tailed albatross.

The endangered short-tailed albatross (*P. albatrus*) and threatened Steller's eider (*P. stelleri*) 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 (50 CFR 17.95(b)). Effects of the Alaska groundfish fisheries on these two species are evaluated in this biological assessment.

5.0 Short-tailed Albatross

5.1 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 are 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)

5.2 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 is estimated to be approximately 1,928 individuals and the worldwide total population is approximately 4,354 individuals (USFWS 2014; the population was estimated at 400 in 1988, 700 in 1994). The current population status was recently reviewed in detail by USFWS (2014), 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)."

5.3 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 2008-2012 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 2014)

5.4 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 3). Females tend to spend more time off of 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 3), possibly due to the presence of squid, which are an important prey species (Suryan et al. 2006, Walker et al. 2015, *in press*). 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).

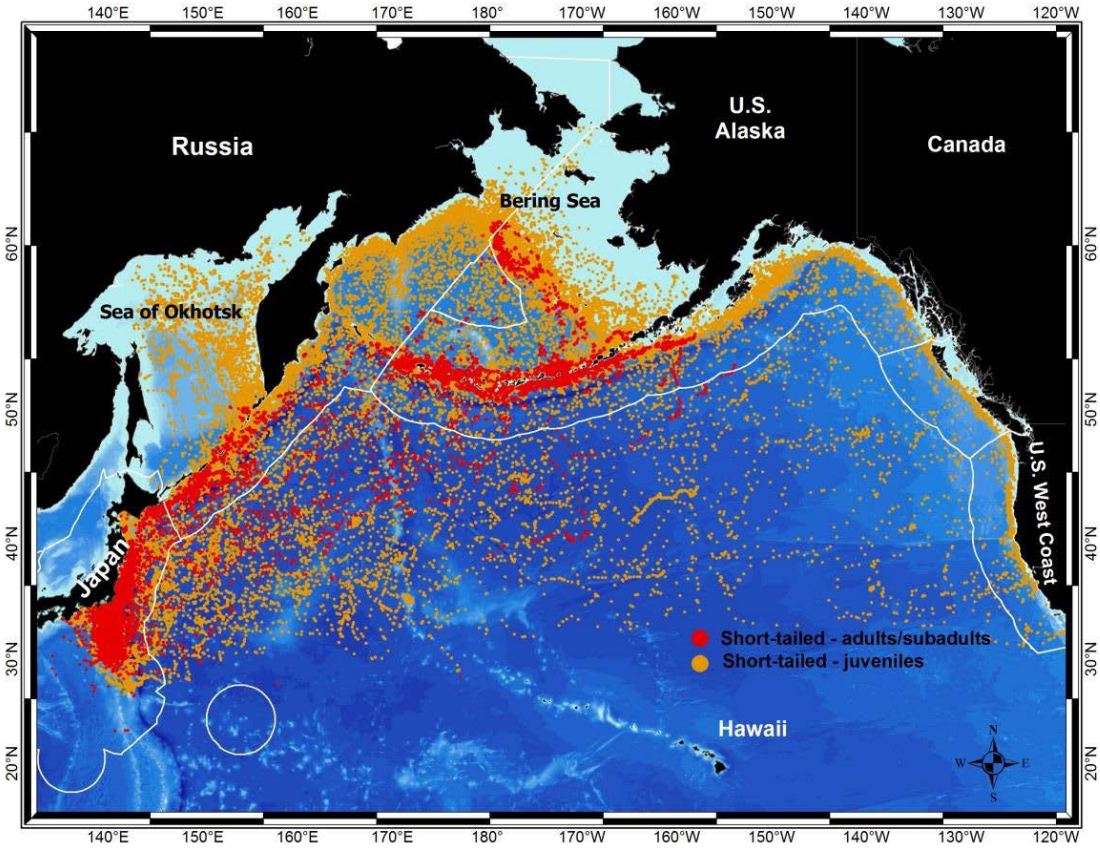

Figure 3 Short-tailed albatross locations tracked between 2002 and 2012, showing adult and juvenile distributions in the North Pacific. Where shown, white lines represent the exclusive economic zones of countries within the range of short-tailed albatross. (Figure 2 in USFWS 2014)

The short-tailed albatross' current range includes the BSAI and the GOA; it once ranged throughout most of the North Pacific Ocean (Figure 4). New information regarding the current range of short-tailed albatross is discussed in detail in the most recent 5-year review by USFWS (2014). Most short-tailed albatross in Alaska are found in the BSAI (Guy et al. 2013, as cited in USFWS 2014). Guy et al. (2013; as cited in USFWS 2014) reported that the U.S. west coast has a higher density of subadults than previously thought. A recent study provided a more complete range description by satellite tagging post-fledging juvenile birds (Deguchi et al. 2014, as cited in USFWS 2014). 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 2014). Aleutian Island waters have recently been highlighted as important areas used for feeding during the time when the short-tailed albatross molt (USFWS 2014). O'Connor (2013, as cited in USFWS 2014) 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 2014).

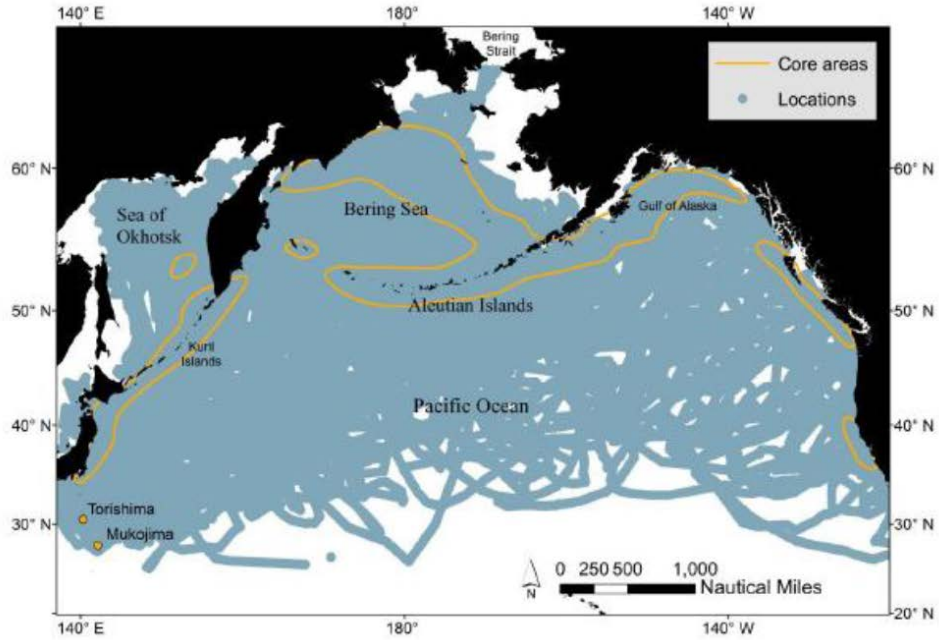

Figure 4 Core habitat (50 percent kernel) and point locations showing extent of travel for immature short-tailed albatross (O'Connor 2013, as cited in USFWS 2014; Figure 3 in USFWS 2014).

Kuletz et al. (2014, as cited in USFWS 2014) 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 2014).

Using a variety of methods, Guy et al. (2013, as cited in USFWS 2014) determined that distribution of the more common black-footed albatross (*Phoebastria nigripes*) is similar to that of the short-tailed albatross, and thus black-footed albatross could be used as a proxy for short-tailed albatross distribution on the U.S. west coast for assessing fishery interaction (USFWS 2012a). The sablefish hook-and-line fishery had the greatest overlap with black-footed and short-tailed albatross (Guy et al. 2013, as cited in USFWS 2014).

5.5 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).

5.6 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 (USFWS 2008).

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

5.7 Threats – Non-fishery Related[3]

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 2014). 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

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

main colony site of Tsubamezaki (USFWS 2014). 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, 2014).

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 2014).

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) 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).

5.8 Threats – Fishery Related[4]

5.8.1 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 9 below).

In preparing this biological assessment, we are aware of additional international conservation and bycatch mitigation measures related to short-tailed albatross which are summarized on the NMFS International Seabird Conservation Web site[5]. 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[6] 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[7] (ACAP), 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.

Japan

There are limited bycatch data 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 2014). 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 2014). One short-tailed albatross take was reported during bycatch mitigation research in Japan in 2013 (Table 9). USFWS (2014) 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.

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

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

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

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

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 hook-and-line cod fisheries 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 2014)

Canada

USFWS (2014) 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 (2014) 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 2014).

Drift-net Fishing in North Pacific

USFWS (2014) 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).

5.8.1 Commercial Fishing by U.S. Fisheries

Since the 2003 biological opinion (USFWS 2003b), seven short-tailed albatross mortalities associated with commercial fisheries have been reported: six 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 9). 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

A short-tailed albatross was taken off the U.S. west coast in 2011 by the sablefish demersal hook-and-line fishery managed by NMFS's West Coast Region. As the result of formal ESA consultation between NMFS and USFWS, USFWS released a biological opinion in 2012 (USFWS 2012a) concluding that the operation of Hawaii-based pelagic hook-and-line fisheries would not jeopardize the continued existence of short-tailed albatross. The biological opinion anticipates the yearly average take of one short-tailed albatross from hook-and-line hooks or trawl cables (USFWS 2012a). The extent of short-tailed albatross take is assessed by reported takes and by assessing effects to a surrogate species (black-footed albatross) (USFWS 2012a). The Pacific Fisheries Management Council adopted seabird bycatch mitigation measures in November 2013. The proposed rule (79 FR 53401, September 9, 2014) to implement these seabird bycatch mitigation measures would amend the regulations governing the Pacific Coast groundfish fishery to require the use of streamer lines and related provisions currently mandated in the Alaskan groundfish fishery (50 CFR 679.24(e))—by vessels 55 ft LOA or greater using bottom hook-and-line gear pursuant to the Pacific Coast Groundfish FMP. Research is underway to confirm the effectiveness of these proposed regulations for vessels greater than or equal to 55 ft (17 m) (USFWS 2014). In 2011, NOAA Fisheries implemented a new management system for the West Coast Groundfish Trawl Fishery (75 FR 60868, October 1, 2010). The trawl catch share program requires that vessels participating in the shorebased Individual Fishing Quota program have observer coverage at all times the vessel is at sea to, in part, achieve individual accountability of catch and bycatch.

Hawaii

As the result of formal ESA consultation between NMFS and USFWS, USFWS released a biological opinion in 2012 (USFWS 2012b) concluding that the Pacific Coast Groundfish FMP 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 2012b). Consultation has been reinitiated on the effects of the Hawaiian-based hook-and-line fishery (USFWS 2014).

North Pacific U.S. Coast

Short-tailed albatross mortalities have occurred in the Alaska groundfish fishery summarized in Table 9 and discussed in detail in Section 5.9.1.

Table 9 Reported short-tailed albatross mortalities associated with Pacific fishing activities since 1983. Adapted from Table 3, USFWS (2014) with additional information for 2014 that was reported after the release of USFWS (2014).

Date	Fishery	Observer Program	In sample*	Bird age	Location	Source
7/15/1983	Net	No	n/a	4 months	Bering Sea	USFWS (2014)
10/1/1987	Halibut	No	n/a	6 months	Gulf of Alaska	USFWS (2014)
8/28/1995	IFQ sablefish	Yes	No	1 year	Aleutian Islands	USFWS (2014)
10/8/1995	IFQ sablefish	Yes	No	3 years	Bering Sea	USFWS (2014)
9/27/1996	Hook-and-line CP targeting Pacific cod	Yes	Yes	5 years	Bering Sea	USFWS (2014)
4/23/1998	Russian salmon drift net	n/a	n/a	Hatch-year	Bering Sea, Russia	USFWS (2014)
9/21/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	8 years	Bering Sea	USFWS (2014)
9/28/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	Sub-adult	Bering Sea	USFWS (2014)
7/11/2002	Russian**	n/a	n/a	3 months	Sea of Okhotsk, Russia	USFWS (2014)
8/29/2003	Russian demersal hook-and-line	n/a	n/a	3 years	Bering Sea, Russia	USFWS (2014)
8/31/2006	Russian**	n/a	n/a	1 year	Kuril Islands, Russia	USFWS (2014)
8/27/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	7 years	Bering Sea/Aleutian Islands	USFWS (2014)
9/14/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	3 years	Bering Sea/Aleutian Islands	USFWS (2014)
4/11/2011	Sablefish demersal hook-and-line	Yes	Yes	1 year	Pacific Ocean, Oregon	USFWS (2014)
10/25/2011	Hook-and-line CP targeting Pacific cod	Yes	Yes	1 year	Bering Sea	USFWS (2014)
5/24/2013	Hook-and-line, seabird bycatch mitigation research	No	n/a	1 year	Pacific Ocean, Japan	USFWS (2014)
9/7/2014***	Hook-and-line CP targeting Pacific cod	Yes	No	5 years	Bering Sea	NMFS Informational Bulletin 49 (2014); 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 Informational Bulletin 52 (2014); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication
12/16/14***	Hook-and-line CP targeting Pacific cod	Yes	Yes	Immature	Bering Sea	NMFS Informational Bulletin 31 (2015); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication

*"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 (2014)

5.9 Effects of the Alaska Groundfish Fisheries

5.9.1 Direct Effects on Short-tailed Albatross

This section describes the federally managed Alaska groundfish fisheries that may interact with ESA-listed species and their critical habitat. The domestic groundfish fishery off Alaska is the largest fishery by volume in the United States. The fisheries descriptions (discussed in Section 4.0) set the context for assessing direct and indirect effects. Of primary concern are those attributes that influence the exposure of listed species to the fishery and potential outcomes, including gear type, seasonality, and geographic extent. Short-tailed albatross visit and follow commercial fishing vessels in Alaska that target sablefish, Pacific cod, Pacific halibut, and pollock (USFWS 2008). It is important to discuss when and where the gear is deployed as well as the amount of fishing effort (in terms of metric tons as well as hooks fished, if applicable) for comparison with the distribution of listed species. 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).

As discussed in Section 5.8.1, there have been recorded takes of short-tailed albatross in the GOA and BSAI groundfish fisheries. Since 1995, 11 short-tailed albatross mortalities have been recorded in the Alaska groundfish fishery (Table 10, Figure 5).

Table 10 Short-tailed albatross mortalities associated with Alaska groundfish fishing activities since 1995. Adapted from Table 3, USFWS (2014) with additional information for 2014 that was reported after the release of USFWS (2014).

Date	Fishery	Observer Program	In sample*	Bird age	Location	Source
8/28/1995	IFQ sablefish	Yes	No	1 year	Aleutian Islands	USFWS (2014)
10/8/1995	IFQ sablefish	Yes	No	3 years	Bering Sea	USFWS (2014)
9/27/1996	Hook-and-line CP targeting Pacific cod	Yes	Yes	5 years	Bering Sea	USFWS (2014)
9/21/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	8 years	Bering Sea	USFWS (2014)
9/28/1998	Hook-and-line CP targeting Pacific cod	Yes	Yes	Sub-adult	Bering Sea	USFWS (2014)
8/27/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	7 years	Bering Sea/Aleutian Islands	USFWS (2014)
9/14/2010	Hook-and-line CP targeting Pacific cod	Yes	Yes	3 years	Bering Sea/Aleutian Islands	USFWS (2014)
10/25/2011	Hook-and-line CP targeting Pacific cod	Yes	Yes	1 year	Bering Sea	USFWS (2014)
9/7/2014**	Hook-and-line CP targeting Pacific cod	Yes	No	5 years	Bering Sea	NMFS Informational Bulletin 49 (2014); 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 Informational Bulletin 52 (2014); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication
12/16/14**	Hook-and-line CP targeting Pacific cod	Yes	Yes	Immature	Bering Sea	NMFS Informational Bulletin 31 (2015); S. Fitzgerald, NMFS AFSC, June 2015, Personal Communication

*"In sample" refers to whether a specimen was in a sample of catch analyzed by a fisheries observer
**This data was not included in USFWS (2014)

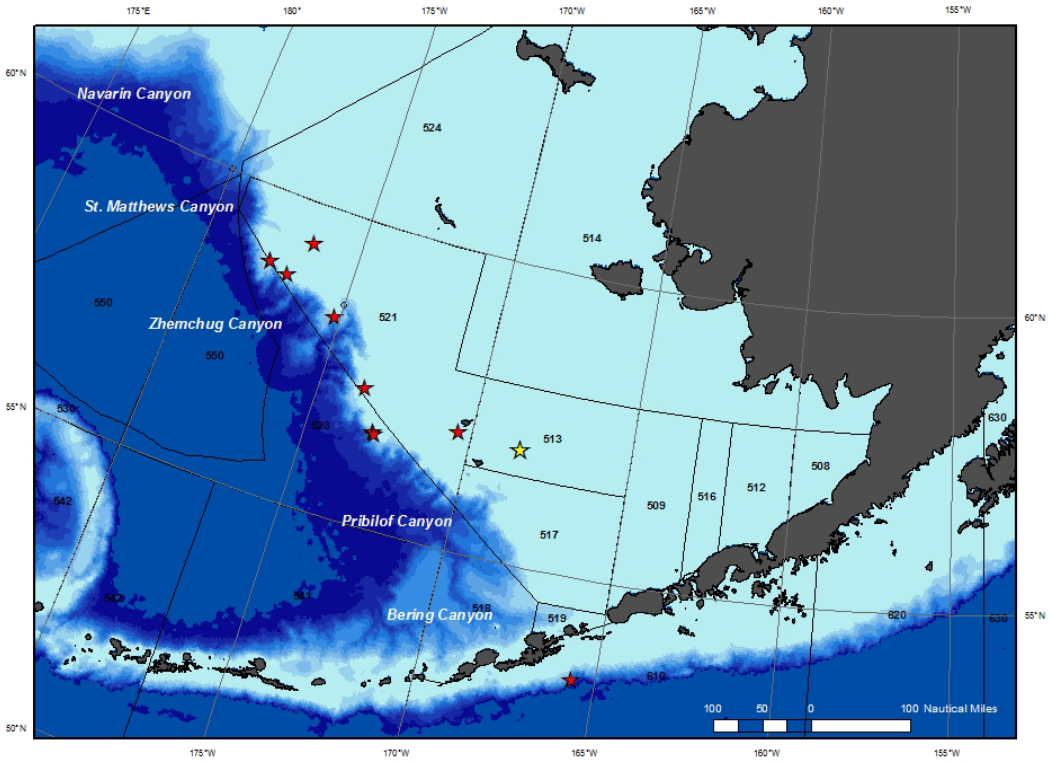

Figure 5 Observed locations of short-tailed albatross takes in Alaska groundfish fisheries since 1995 (red stars). Two takes, in September 2014, occurred in the same location and are represented by one star. Latest confirmed take on December 16, 2014, is shown by the yellow star. (NMFS Informational Bulletin 31 [2015])

5.9.1.1 Hook-and-line, Groundfish

Hook-and-Line groundfish fisheries and estimates of hooks deployed

Demersal hook-and-line vessels in the areas managed by the GOA and BSAI Groundfish FMPs fish with fixed hooks strung along a ground line. The ground line can be several miles long, and can have thousands of baited hooks attached. The hook-and-line fleet is composed of both CVs and CPs. Vessels using hook-and-line gear target Pacific cod, Pacific halibut, sablefish, turbot, and some rockfish species (AFSC 2011). Species that are important in the short-tailed albatross' non-breeding season diet includes squids, crustaceans, and fishes (Hasegawa and DeGange 1982; Walker et al. 2015, *in press*). Short-tailed albatross may have the greatest potential for interaction with sablefish fisheries, as 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, areas where sablefish fisheries occur. However, because Pacific cod fisheries on the Bering Sea shelf have greater fishing effort (number of hooks set), they have the potential for greater seabird bycatch, and thus interactions with short-tailed albatross (Suryan et al. 2007).

Since 2010, changes in Federal regulation and fleet behavior have changed the amount of observer coverage in the Bering Sea and Aleutian Islands for vessels fishing with hook-and-line gear. In August 2010, hook-and-line CPs in the BSAI formed a fishing cooperative to better manage Pacific cod. These types of cooperatives were developed upon authorization provided by the Longline Catcher Processor Subsector Single Fishery Cooperative Ac t of 2010 (Pub. L. 111–335). Formation of the fishing cooperative resulted in vessels that were required to carry an observer on 30 percent of their days

fished (vessel size between 60 and 125 ft LOA) to voluntarily increase their days observed. The increase in observer coverage provided more data to help the cooperative harvest its allocation of Pacific cod. Reports from the fleet suggest between 50 and 70 percent of the days fished were actually observed during this period for the segment of vessels with 30 percent coverage requirements (NMFS 2012). All trips taken by vessels greater than 125 ft were required to carry an observer (CVs and CPs). In 2013, major changes to regulations governing the deployment of observers in the hook-and-line CP sector were implemented (77 FR 70062, November 21, 2012). These new regulations required that all trips taken by a CP be observed, and coverage requirements were expanded to include CVs between 40 and 60 ft, which were previously not subject to observer coverage. Thus, starting in 2013 all CP trips were observed and the deployment on CVs greater than 40 ft LOA was governed under the Observer Program's annual deployment plan (e.g., NMFS 2014a).

Figures below show the location and timing of effort for the BSAI hook-and-line CPs with 100 percent observer coverage (as described in Section 4.3.4) in the Alaska groundfish fisheries (Figure 6, Figure 7). BSAI hook-and-line CPs harvested more groundfish (metric tons) in the fall and winter (October through March) than the spring and summer (April through September) months (Figure 6, Figure 7). 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 5.4). Although short-tailed albatross interactions, especially with juveniles, could occur at any time, these data suggest that the greatest chance of interaction between the BSAI hook-and-line CPs and short-tailed albatross adults is during October and November (overlap between the short-tailed albatross non-breeding season (May through November) and the winter season (October through March) when BSAI hook-and-line CPs harvested more groundfish (metric tons)). However, most of the short-tailed albatross mortalities associated with the BSAI and GOA groundfish fisheries have been juveniles taken between September and October (Table 10).

Hook-and-line CVs do not have the high level of observer coverage of the CPs; thus a similar figure showing spatial and temporal distribution would not be as representative of the entire fleet. The effort of CVs is focused in the GOA, with much less effort in the Aleutian Islands and the Bering Sea (Table 4, Table 5, Table 6).

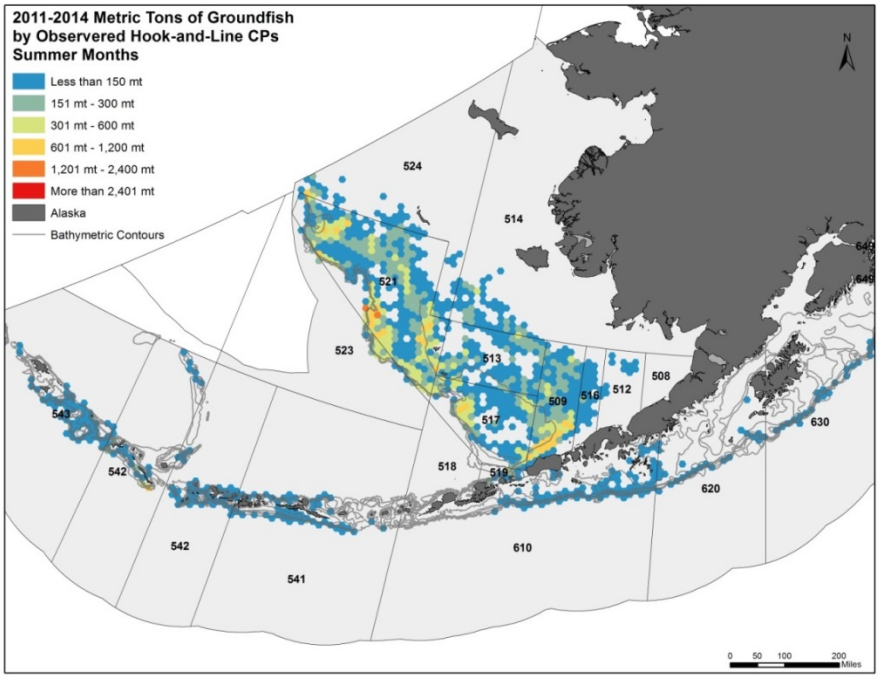

Figure 6 Metric tons of groundfish harvested (2011 through 2014) by observed hook-and-line CPs in Alaska groundfish fisheries in summer months (April through September).

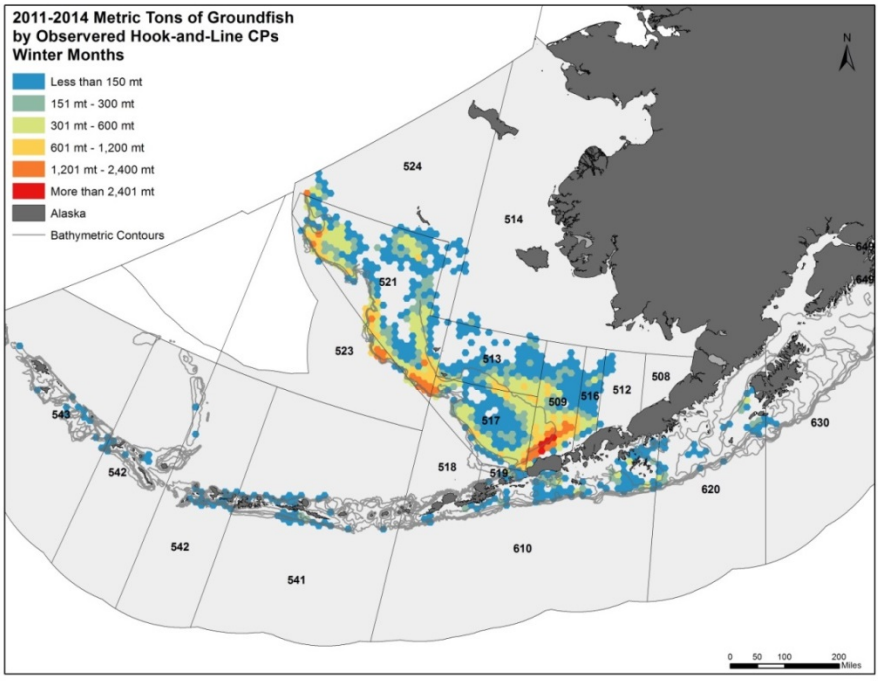

Figure 7 Metric tons of groundfish harvested (2011 through 2014) by observed hook-and-line CPs in Alaska groundfish fisheries in winter months (October through March).

Birds are attracted to baited hooks and discarded fish offal that result from fishing activities in the hook-and-line fishery. 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). 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).

NMFS and the Council manage Alaskan groundfish fisheries on a quota-based system. Weight of landed catch is used for managing the 600 fishery quotas noted earlier and for estimation of bycatch. Seabird catch rates are best described, however, based on hook counts. While 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, and seabird bycatch rates (birds/1,000 hooks is the commonly accepted international standard). For the purpose of estimating total hooks fished, the different types of observer coverage require estimating total hooks using three different methods. For CPs, since the fleet has nearly full observer coverage, we relied on observer information that provides information on total hooks fished and assume these values are known without error. The total hooks fished by CVs were estimated using two different methods, the details of which are provided below. These estimates are preliminary and for the purpose of this biological assessment only. 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.

The number of hooks deployed by CPs is estimated using observer information. For days when an observer is on board, the number of hooks is estimated based on the number of hooks per set that is recorded by an observer, and the number of sets made per day that is obtained either through observer counts of sets or vessel logbook information. On CPs, nearly all fishing days occur when an observer is on board, resulting in an estimate of total hooks fished for the entire season. Since 2013, nearly all hauls on CPs in the BSAI and GOA have estimated hook-counts made by the Observer Program. A summary of estimated hook counts for CPs in the BSAI operating in the last five years, between 2010 and 2014, is provided in Figure 8**.** A small underestimate is expected prior to 2013 since fishing events occurred when an observer was not on board and thus hook-counts for these events are unavailable. Figure 8 shows that the number of hooks deployed by the CP sector has increased between 2010 and 2014. A summary of estimated hook-counts for CPs in the BSAI operating between 2010 and 2014 by month is provided in Figure 9**.** Figure 9 shows that in recent years more hooks are being set by the CP sector in March through July relative to prior years.

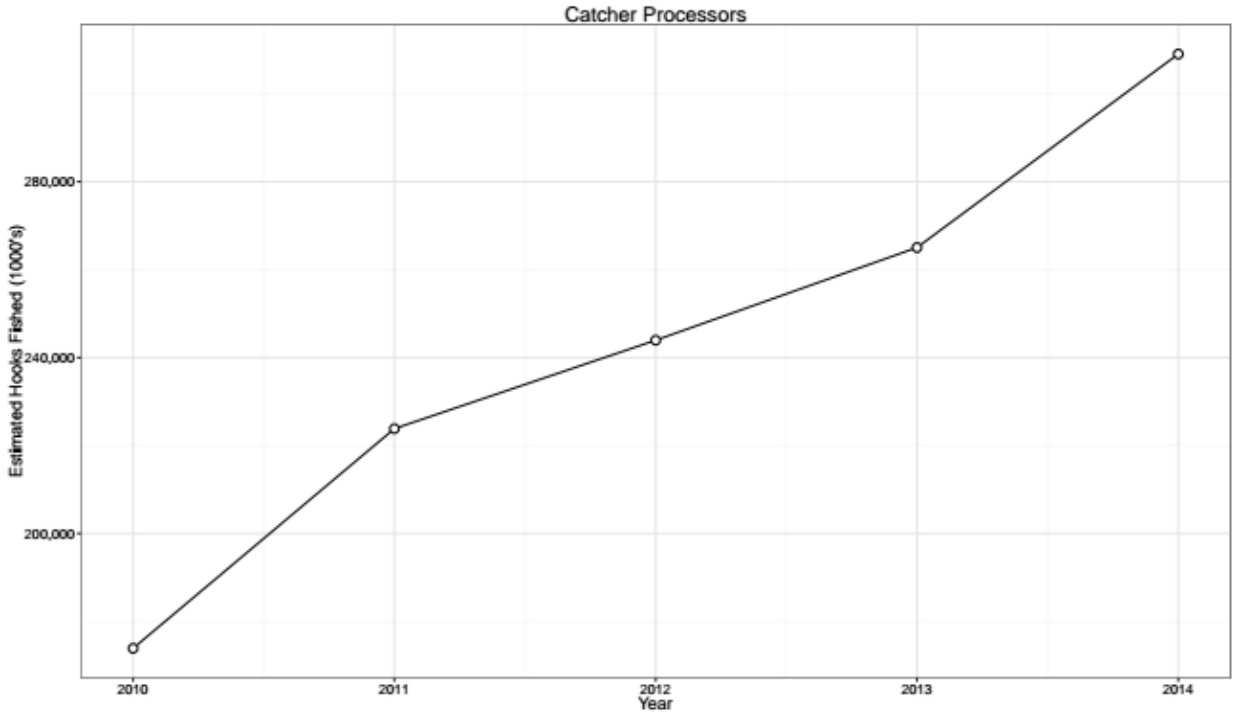

Figure 8 Estimated number of hooks fished (1,000's) from 2010 through 2014 by observed hook-and-line CPs in BSAI groundfish fisheries.

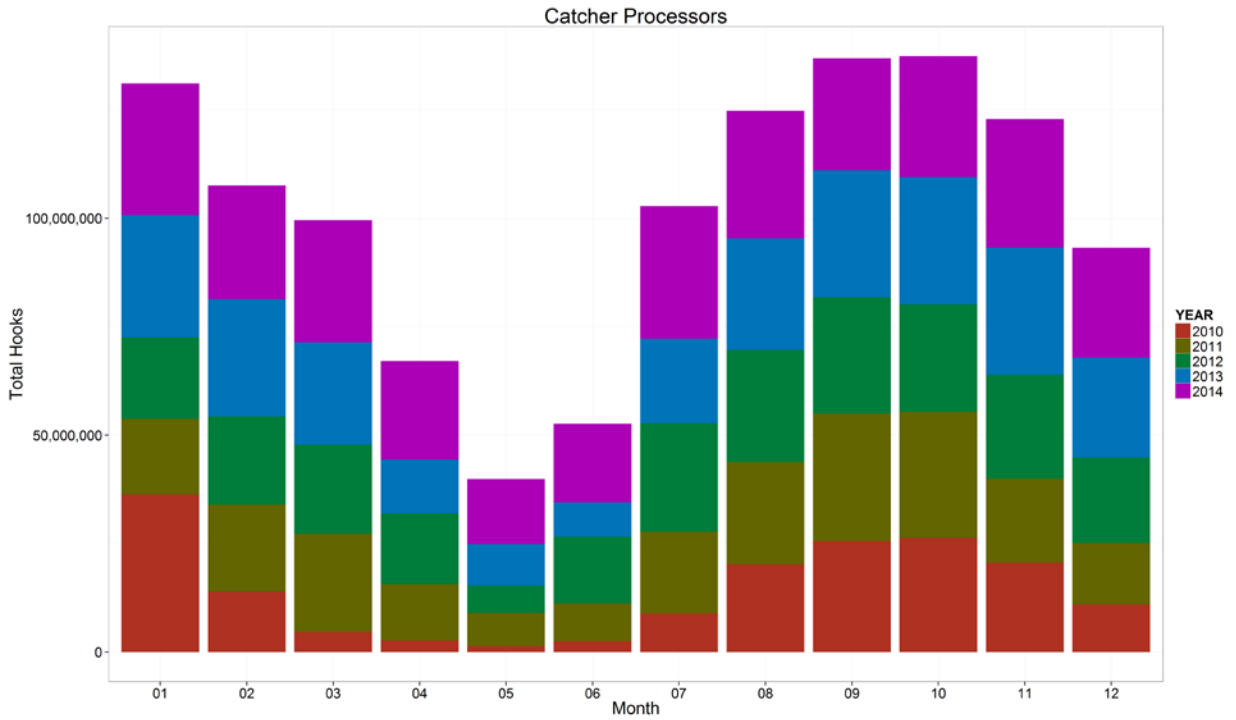

Figure 9 Summary of estimated total hooks by month for CPs in the BSAI groundfish fisheries operating from 2010 through 2014.

In the 2013 through 2015 ADPs (NMFS 2014a), observers were deployed using random selection on CVs greater than or equal to 40 ft LOA. Since most hook-and-line CVs operating in the BSAI were

unobserved prior to 2013, very limited observer information on total hooks fished was available on this fleet (logbook information is currently unavailable). Thus, observer data from 2013 and 2014 was used to estimate total hooks between 2010 and 2014 for vessels greater than or equal to 40 ft LOA. The mean number of hooks per trip was calculated and a bootstrap method was used to derive a 95 percent confidence interval (Figure 10). The total number of trips was calculated from landing reports by assuming that a unique combination of vessel and date fishing started (as reported on a landing report) was analogous to a single trip. The mean (and associated bootstrapped intervals) were expanded by the total number of trips to obtain an estimated number of hooks fished (Figure 10). Figure 10 shows that the estimated number of hooks deployed by the CV sector (greater than or equal to 40 ft LOA) has gradually increased from 2010 through 2014. The total number of estimated hooks deployed by the CV sector (greater than or equal to 40 ft LOA) is roughly 30 times fewer than the CP sector in the BSAI (Figure 8, Figure 10).

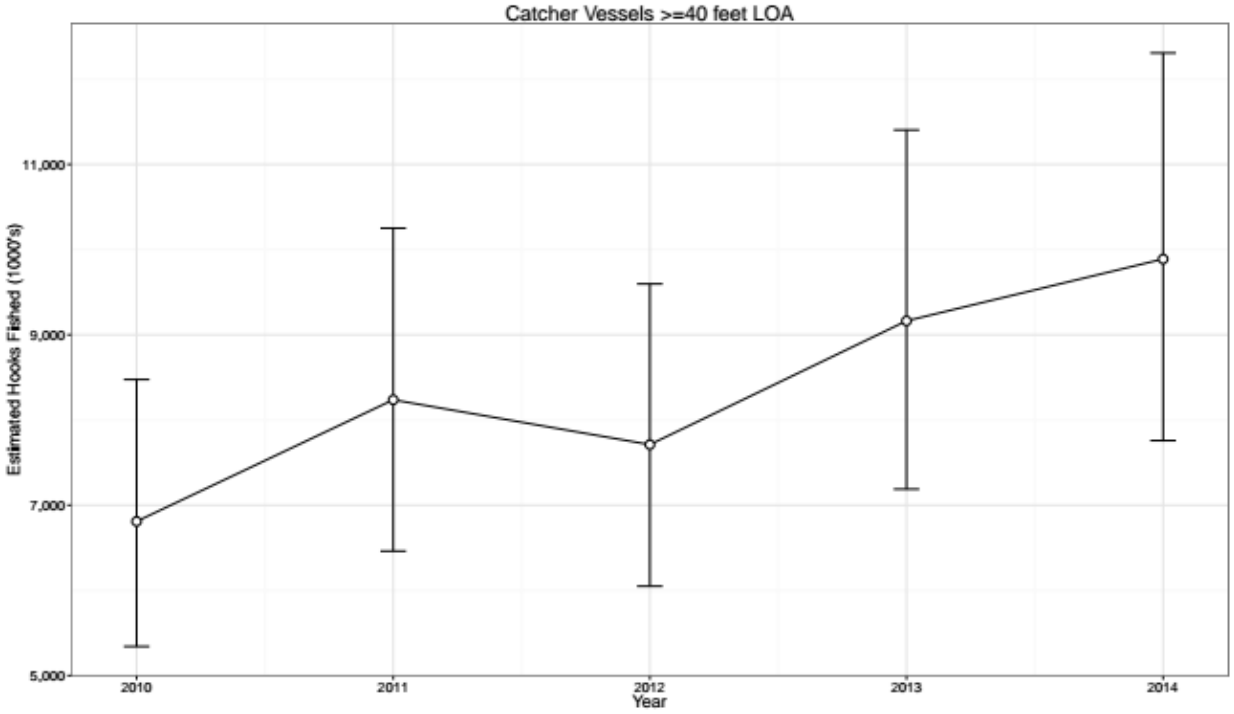

Figure 10 Estimated number of hooks fished (1,000's) from 2010 through 2014 by CVs (greater than or equal to 40 ft LOA) in BSAI groundfish fisheries.

Total hook-counts are unavailable for CVs 26 ft to less than 40 ft LOA because they are unobserved. The fishing characteristics of these vessels may be different than larger vessels that were observed (i.e., vessels greater than or equal to 40 ft LOA). For example, smaller vessels may take shorter trips and may fish fewer hooks. For this reason, mean hook counts from vessels greater than or equal to 40 ft LOA were not used to estimate total hooks on these smaller vessels. Instead model-based methods were used to predict total hooks fished based on the landed amount of groundfish and halibut on a per-trip basis for small CVs in the BSAI. A simple log-linear regression model was fit using observer data collected on hook-and-line CVs in the BSAI in 2013 and 2014. Haul data was aggregated to the trip level, with the explanatory variable being the amount of retained groundfish for the trip (obtained from landings information) and the response variable being total hooks for the observed trip (obtained from observer information). The model fit was poor and explained only 39 percent of the total variation; however, the model is useful for exploring the magnitude of total hooks on small CVs (26 to less than 40

ft LOA) relative to CPs and large CVs (greater than or equal to 40 ft LOA). Since the model relies on retained catch as the explanatory variable, estimates are not made prior to 2013 because halibut landings were not available in the CAS: thus, total retained catch is unavailable. Bootstrapping using observation re-sampling was used to estimate confidence intervals for the yearly totals.

Preliminary model estimates show that CVs 26 ft to less than 40 ft LOA fished substantially fewer hooks than other vessel size classes. In 2013, the model estimated 1,554,366 hooks were fished (95th percentile: 883,436 to 2,394,825). The estimated number of hooks increased in 2014 to 2,168,344 (95 percent confidence interval: 1,218,249 to 3,377,709). These estimates were substantially less than CVs greater than or equal to 40 ft LOA that fished approximately 9 million to 10 million hooks during the same years, and much less than CPs.

GOA hook-counts could not be estimated due to lower observer coverage levels. Effort in the GOA was described in Section 4.3.1. The hook-and-line groundfish harvest (metric tons) was greater in the CV sector than the CP sector in the GOA (Table 6). Overall, the total amount (metric tons) of groundfish harvested was greater in the BSAI than the GOA (Table 4, Table 5, and Table 6); however, the total number of hook-and-line vessels (CVs and CPs) was greater in the GOA than the BSAI (Table 3).

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 BSAI and GOA groundfish fisheries 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 4.3.6 (Figure 11). Streamer lines were one of the options for mandatory avoidance measures in 1997 and in 2004 the regulations were revised to require the use of streamer lines with standards of proven effectiveness.

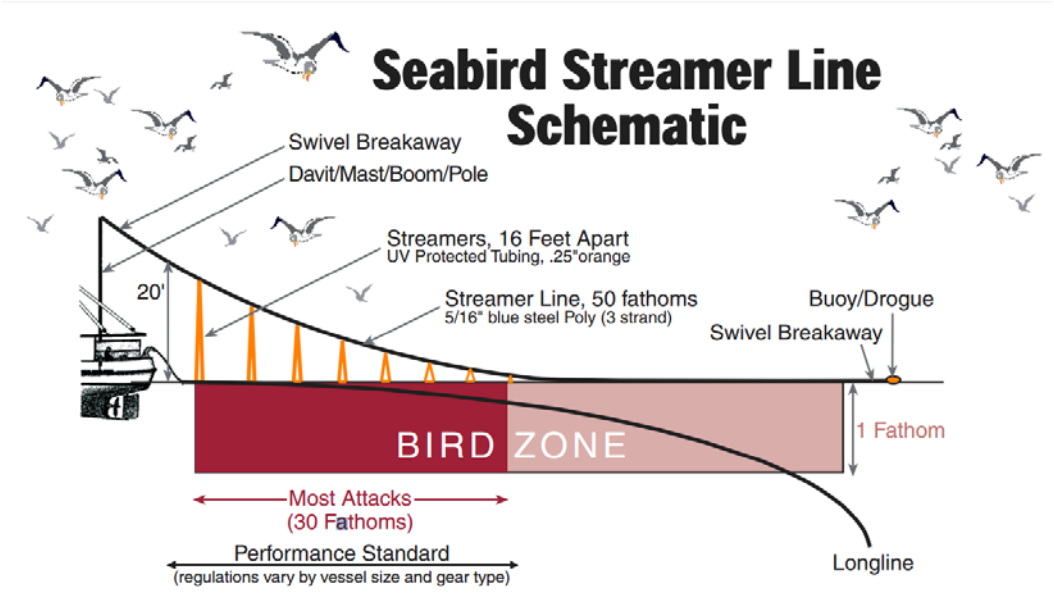

Figure 11 Streamer lines used to reduce seabird bycatch in hook-and-line fisheries (Melvin 2000).

Melvin et al. (2001) reported a reduction of 88 to 100 percent of seabird bycatch could be achieved in Alaska hook-and-line fisheries with paired streamer lines. A study published in 2009 found that seabird bycatch rates have decreased in Alaska hook-and-line fisheries since streamer lines were required in

2004, but only by 78 percent, implying that streamers may not be utilized properly on all vessels (Dietrich et al. 2009). In 2010, the AFSC reported that a small number of vessels were responsible for the majority of seabird bycatch (Dietrich and Fitzgerald 2010). Six out of 39 vessels contributed 38 percent of all seabird bycatch in the Pacific cod hook-and-line CP fishery when sampled rates were extrapolated to hooks deployed in observed sets (Dietrich and Fitzgerald 2010). A few vessels had the highest bycatch rates across all years and the vessels at the lowest end of the seabird bycatch rate were also consistent across years, and fisheries (Dietrich and Fitzgerald 2010). The reasons for these varying bycatch rates remains elusive but are generally thought to be associated with configurations of the vessel itself, how quickly the gear sinks, effectiveness of the streamer lines being deployed, and perspective of the officers and crew towards using mitigation gear (Dietrich and Fitzgerald 2010).

From 1993 to 2006, fisheries data collected by observers was analyzed and summarized by the NMFS AFSC to provide estimates of seabirds caught as bycatch in commercial BSAI and GOA groundfish fisheries (Fitzgerald et al. 2008). Since 2006, the NMFS Alaska Region's CAS (Cahalan et al. 2010) has been used to calculate the bycatch estimates, based on data collected from observers, which inform the annual report on seabird bycatch in Alaska. The annual seabird bycatch report provides seabird bycatch estimates for the Alaska groundfish and halibut fisheries.

The latest seabird bycatch report was released by the AFSC in December 2014 and provides seabird bycatch estimates by species or species group for the commercial groundfish fisheries operating in the EEZ off Alaska and estimates of seabird mortalities from 2007 through 2013 and the estimates for the Pacific halibut fishery off Alaska for 2013, the first year that observers were onboard halibut vessels and collected fishery catch and bycatch data (AFSC 2014b). This report includes seabird bycatch estimates for the groundfish fishery (including hook-and-line, pot, and trawl gear but not including jig gear). Since 2013, the report has included data from the halibut fishery as well as data from vessels less than 60 ft LOA, as part of the restructured Observer Program (as previously discussed in Section 4.3.4). This report uses information that was provided by the CAS in 2014. It is important to note that the data in the CAS continuously undergoes quality checks and thus may vary depending on when the data was taken from the system.

As previously discussed in Section 4.3.5, 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 report (AFSC 2014b) are based on data from the observer species composition sample. Certain observer sampling biases are known to exist with commercial fisheries. For example, in the hook-and-line fishery, seabirds may fall off a hook underwater without being seen by the observer. Birds that fall off the hooks alongside the vessel are recorded if they occur within the observer sample period. 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 or outside of the observer sample. Currently, for short-tailed albatross, even if the bird is not brought onboard 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.

All but one of the documented short-tailed albatross takes in the BSAI and GOA groundfish fisheries have been in the hook-and-line fisheries (Table 9). Most short-tailed albatross take has occurred on CP vessels using hook-and-line gear to target Pacific cod (Table 10). Two short-tailed albatross takes in 1995 were attributed to the IFQ sablefish fishery (Table 10).

Table 11 shows the recorded incidental take and the estimated incidental take (data from the CAS) of short-tailed albatross in the BSAI hook-and-line fishery, 1993 through 2014. Figure 8 shows that the number of hooks deployed by the CP sector has increased from 2010 through 2014; however, Table 11 shows that 2010 had the highest estimated take of short-tailed albatross and 2011 through 2013 when more hooks were set had fewer short-tailed albatross takes. Those numbers rise again in 2014. However, take events for short-tailed albatross, whether the bird occurs within the observer sample or comes from outside the sample, are so extremely rare relative to fishing effort (hooks set, or hauls made) that a deeper analysis is required to fully examine additional risk.

The numbers of seabirds hooked are counted during the randomized sampling period when observers record the discard and retention of animals, along with other data collection such as average weight and biological specimens. This randomized sampling period is defined by sampling methods outlined in the Observer Program Manual (AFSC 2014a). The number of hooked seabirds counted during the sampling period are used for CAS catch estimation, and are expanded to all unsampled hooks in the haul and all unsampled events across fisheries (for methods see Cahalan et al. 2014). However, seabird takes can also be recorded by observers outside of their sampling period. A record of these takes by observers is opportunistic since they occur outside of the random sampling protocol, thus their inclusion in the total seabird estimate across all fisheries would be inappropriate. Observers generally do not record any information for a seabird outside of their sample, unless it is banded, collected as part of the necropsy program, or is a species of special interest or ESA-listed species. For example, in 1995 both short-tail albatross taken were not within the observer sample, so the estimated take was 0 while the known take was 2 birds. It is important to note that short-tailed albatross takes recorded by observers, whether within or outside of their sampling period, are counted towards the incidental take statement for the groundfish hook-and-line fishery that allows four short-tailed albatross within 2-year periods established based on publication of the 2003 biological opinion (USFWS 2003b). These 2-year periods run from September 16, 2003 through September 15, 2005, and in each following period. Note that our estimation of annual seabird bycatch is based on the calendar year while the incidental take period begins and ends in mid-September every odd year.

Table 11 Recorded incidental take and estimated incidental take of short-tailed albatross in the BSAI hook-and-line fishery, 1993 through 2013. Recorded take data from 1993 through 2013 (USFWS 2014) and 2014 (NMFS Informational Bulletin 52, October 3, 2014; NMFS Informational Bulletin 31, May 20, 2015). Estimated take data from 1993 through 2006 (Fitzgerald 2008) and 2007 through 2013 (AFSC 2014b).

Year	Take outside the observed sample	Take in the observed sample	Estimated incidental take
1993	0	0	0
1994	0	0	0
1995	2	0	0
1996	0	1	4
1997	0	0	0
1998	0	2	8
1999	0	0	0
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	0	0	0
2004	0	0	0
2005	0	0	0
2006	0	0	0
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	2	15
2011	0	1	5
2012	0	0	0
2013	0	0	0
2014	1	2	9*
TOTAL	3	8	41
Annual Average (1993-2014: 21 years)	0.1	0.4	1.9
*CAS Preliminary Data			

The 2014 seabird bycatch report (AFSC 2014b) estimated the number of short-tailed albatross taken in each year (2007-2013) by the BSAI and GOA groundfish fishery (for pot, hook-and-line and trawl gear). Recent CAS analyses also provide estimates for the 2014 season. Since the 2003 biological opinion (USFWS 2003b) was implemented, and with the new CAS estimation methodology implemented in 2007 (Cahalan et al., 2010) the only takes estimated for short-tailed albatross were by the hook-and-line CPs targeting Pacific cod in the BSAI (Table 10). Short-tailed albatross takes were estimated to be 15 birds for 2010, 5 birds for 2011, and 9 birds for 2014 (AFSC 2014b, Table 11). The hook-and-line groundfish fishery in the GOA was estimated to take 0 short-tailed albatross in all years (2003-2014) (AFSC 2014b).

There were, however, unidentified albatross taken in Alaskan hook-and-line fisheries. Based on our recent re-analysis of the 2007-2014 data via the CAS, there were 78 estimated unidentified albatross in these fisheries over this period, with 17 in 2007, 10 in 2011, 19 in 2013, and 32 in 2014. All unidentified albatross from 2007 through 2013 (estimated 46 total) occurred in the GOA. In 2014, 11 unidentified albatross were estimated for the Bering Sea and 21 for the Aleutian Islands area, with none in the GOA. The number of unidentified albatross recorded and estimated as incidental take in the groundfish fishery has varied broadly since the observers started recording take in 1993.

Observers are usually unable to identify an albatross only when it is not retained – it either falls off the hook or is knocked off the hook by the rollarman as gear is brought onboard. These birds are recorded in the species composition sample during the observer's random sampling tally period. Observers do their best to look for species identification features even for these birds, and some birds not retained are still identified to species. If an observer thinks a short-tailed albatross has been taken (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 their final determination, and the panel of experts provides the Observer Program with their verification of the observer's identification. The bird is then entered into the CAS database or, if outside the observer sample, recorded separately and a formal notice is prepared if it is a short-tailed albatross. There is a chance that a portion of these unidentified albatross are short-tailed albatross and the panel has on occasion felt strongly that a bird was a short-tailed albatross but no diagnostic features were recorded to provide verification. However, given the uncertainty in identifying those birds and the incident review process in place, they are not included in this analysis. If they were included, the estimated take of short-tailed albatross in the Alaska groundfish fishery would be higher (S. Fitzgerald, NMFS AFSC, July, 2015, Personal Communication).

Thus, the greatest number short-tailed albatross estimated to have been taken across the entire groundfish fishery in the BSAI within a 2 year period was 20 (2010-2011; AFSC 2014b). No other take of short-tailed albatross was estimated for any of the other groundfish fisheries included in the report (AFSC 2014b). Given the estimates discussed above and the data available in Table 11, NMFS expects this level of interaction, with takes being relatively rare, to continue. To determine the expected level of sustained impact on the short-tailed albatross population under current population size and growth rates will need to be examined, although an earlier study by Zador et al. (2008b) provides important insights. Below we describe the expected, sustained annual effect of the hook-and-line fisheries on the short-tailed albatross population given the best available data.

The total estimated take of short-tailed albatross is 41 birds over 21 years (1993 through 2014) with an average of 1.9 short-tailed albatross estimated to be taken incidental to the hook-and-line fishery each year. No extrapolations were done for the birds not within the observer sample, but if we add the three known takes not within the observer sample to the 8 reported takes within the observer sample there are 11 birds over 21 years, averaging 0.5 short-tailed albatross per year.

If we only consider the take from 2004 through 2014, there have been 5 observed in-sample short-tailed albatross takes (0.5 per year) and 29 (2.6 per year) estimated short-tailed albatross incidentally caught in the Pacific cod hook-and-line fishery.

In the short-tailed albatross incidental take statement (USFWS 2003b), USFWS anticipated up to four short-tailed albatross could be reported taken bi-annually (every 2 years, beginning September 16 of odd numbered years) as a result of the hook-and-line groundfish fishing activities in the BSAI and GOA areas regulated by NMFS. The Alaska groundfish fisheries have not exceeded the incidental take allowed by the incidental take statement.

Short-tailed albatross takes do occur in the hook-and-line fisheries but these takes are relatively rare, especially given the number of hooks set and the amount of observer coverage in the BSAI where the takes have been recorded. The premise for reinitiating consultation is that the likelihood of observing

short-tailed albatross takes in the groundfish fisheries has increased due to increasing observer coverage and increasing short-tailed albatross population size, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross takes. Based on data from the last 10 years, the best estimate of the total number of short-tailed albatross takes with the groundfish hook-and-line fisheries is 2.6 birds per year. Because observer coverage in the BSAI CP sector is 100 percent of fishing days (as described in Section 4.3.4), with a high percentage of hooks monitored, and with additional observer coverage in previously unobserved fisheries in the GOA due to the restructured observer program, we can anticipate that 3 short-tailed albatross may be observed and recorded taken in each calendar year, on average.

5.9.1.2 Trawl, Groundfish

Trawl gear means a cone or funnel-shaped net that is towed through the water by one or more vessels. The definition of a pelagic trawl is relatively complex, whereas non-pelagic trawls are all other trawls not meeting the pelagic trawl definition. Regulations that define pelagic trawl gear are specified at 50 CFR 679.2. Groundfish harvest effort by sector and gear type was discussed in Section 4.3.1. Figures below show the location and timing of observed effort for the pelagic (Figure 12, Figure 13) and non-pelagic trawl (Figure 14, Figure 15) vessels in the Alaska groundfish fisheries. As mentioned previously, in Section 5.4, short-tailed albatross spend time in Alaska waters, predominantly along the continental shelf during their non-breeding season (May through November). Short-tailed albatross interactions, especially with juveniles, could occur at any time. The greatest chance of interaction between pelagic trawl vessels in the Alaska groundfish fisheries and adult short-tailed albatross occurs from May through September (overlap between the short-tailed albatross non-breeding season (May through November) and the summer season (April through September) when pelagic trawl vessels harvested more groundfish (metric tons)). Non-pelagic trawl vessels do not have a high concentration of fishing near the continental shelf; therefore the chance of interactions with short-tailed albatross is expected to be reduced, relative to the pelagic trawl sector.

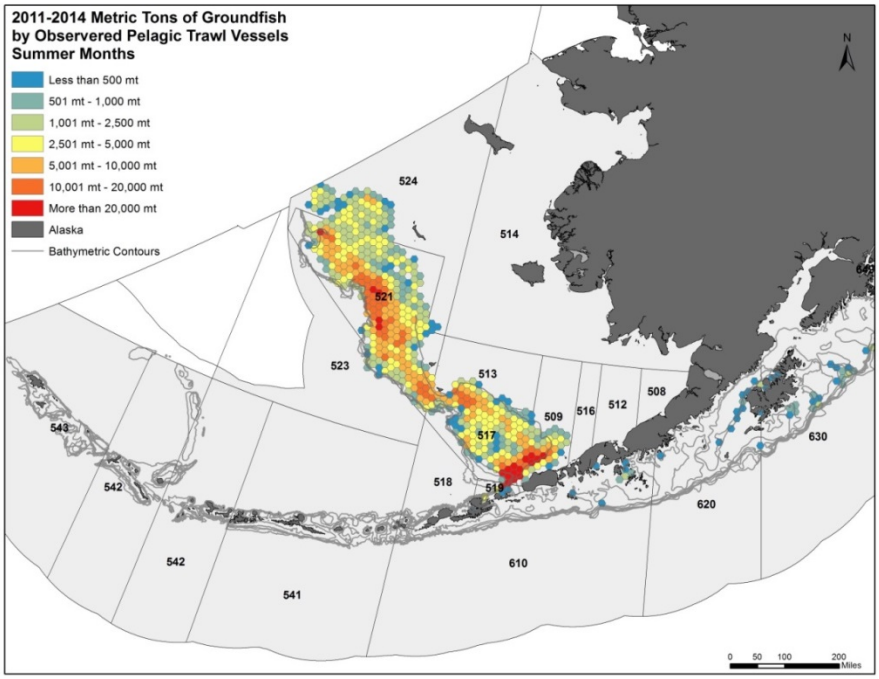

Figure 12 Metric tons of groundfish harvested (2011 through 2014) by observed pelagic trawl vessels in Alaska groundfish fisheries in summer months (April through September).

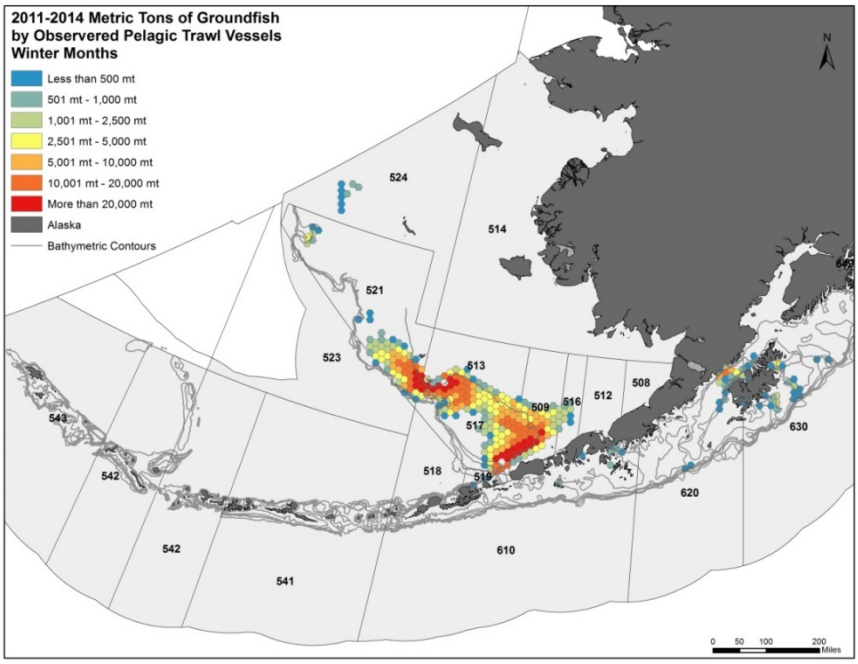

Figure 13 Metric tons of groundfish harvested (2011 through 2014) by observed pelagic trawl vessels in Alaska groundfish fisheries in winter months (October through March).

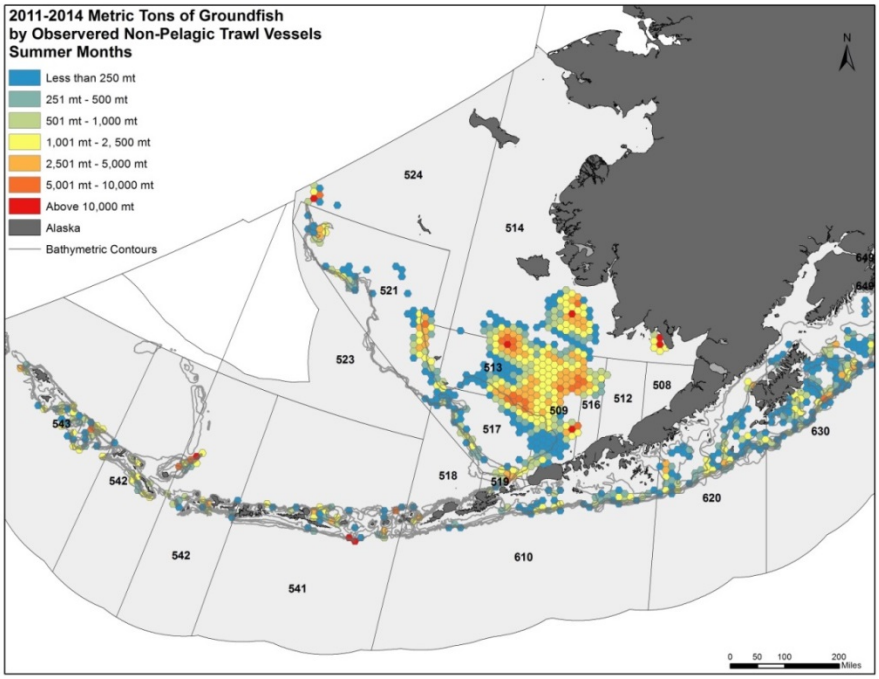

Figure 14 Metric tons of groundfish harvested (2011 through 2014) by observed non-pelagic trawl vessels in Alaska groundfish fisheries in summer months (April through September).

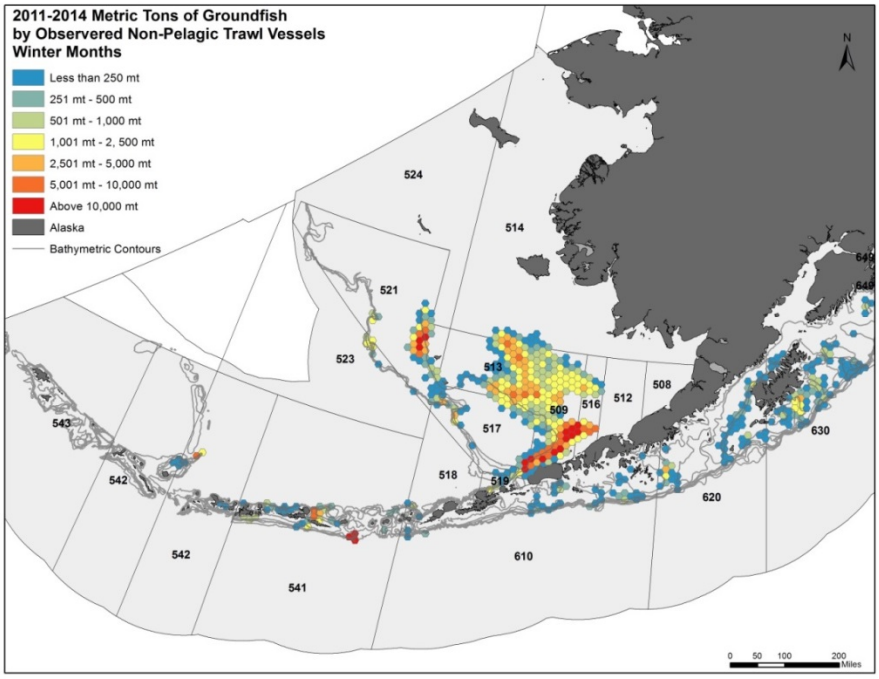

Figure 15 Metric tons of groundfish harvested (2011 through 2014) by observed non-pelagic trawl vessels in Alaska groundfish fisheries in winter months (October through March).

As discussed in Section 4.3.1, non-pelagic trawl harvest (metric tons) of groundfish was greater in the CP sector than the CV sector in the BSAI (Table 4, Table 5); however, non-pelagic trawl harvest (metric tons) was greater in the CV sector than the CP sector in the GOA (Table 6). Pelagic trawl groundfish harvest (metric tons) was greater in the CV sector than the CP sector in the BSAI and GOA (Table 4, Table 5, Table 6). There has been a substantial increase in the proportion of trawl vessels that are observed since 2003 however, no short-tailed albatross have been reported by the trawl sector in the BSAI or GOA. All Amendment 80 CPs in BSAI and GOA have been observed since 2008 (Amendment 80 to the BSAI FMP: 72 FR 52668, September 14, 2007 and corrected 73 FR 27768, May 14, 2008); all pollock CVs in the BSAI have been observed since 2011 (Amendment 91 to the BSAI FMP: 75 FR 53026, August 30, 2010); all CVs in the Central GOA Rockfish Program have been observed since 2007 (72 FR 37678, July 11, 2007); and observer coverage has been expanded to other trawl vessels in the BSAI and GOA beginning in 2013 (77 FR 70062, November 21, 2012).

The non-pelagic and pelagic trawl fisheries differ in the types and biomass of discards, which can play a role in the type of seabird attracted to vessels. The non-pelagic trawl fishery returns a greater biomass of discards to the ocean than does the large pelagic trawl fishery even though it has a smaller amount of catch than the pelagic trawl fishery. The pelagic trawl fishery in the eastern Bering Sea discards rather few fish, and this mostly in a macerated form, whereas it discards large quantities of offal, also predominately in a macerated form, and waste is predominantly produced in early spring and later summer/early autumn. The largest of the pelagic CPs operate fish meal plants on board and provide very little actual biomass in the overboard discharge (Melvin et al. 2011). Zador and Fitzgerald (2008) described the composition of discharged material from Alaska groundfish trawl vessels as varying from "whole discarded fish to heads, offal macerated to 1 cm chunks, and water slurry containing little fish matter, depending on the processing capabilities on board." Maceration of offal and discards by CPs in the eastern Bering Sea make material more suitable for consumption by smaller scavenging seabirds and perhaps less attractive for larger scavenging seabirds (Furness et al. 2007). As seabirds fly and forage

around vessels, they can become entangled in trawl gear or strike a vessel cable. The effects of these interactions will be discussed further below.

Trawl Seabird Bycatch

The latest seabird bycatch report (AFSC 2014b) includes seabird bycatch estimates for the groundfish fishery including hook-and-line, pot, and trawl gear but not including jig gear (methodology previously discussed in Section 5.9.1.1). These estimates are produced by the CAS and are based on the observer species composition sample. These estimates indicate that the overall seabird bycatch in recent years is nearly an order of magnitude less in the trawl fishery than in the hook-and-line fishery, based on the observer sample. However, certain sampling biases are known to exist with commercial trawl fisheries (discussed below). Bycatch of albatross is extremely rare in the trawl fisheries, based on data from the observer species composition sample. Through 2013, only unidentified albatross (mostly in the early years) and Laysan albatross had occurred as bycatch in Alaskan trawl fisheries (AFSC 2014b). However, in 2014 one black-footed albatross was also observed to be taken, for the first time, in this fishery (S. Fitzgerald, NMFS AFSC, July, 2015, Personal Communication). No take of short-tailed albatross has been documented in the BSAI or GOA groundfish fishery when using trawl gear (AFSC 2014b).

Seabirds are attracted to hook-and-line vessels during the set, when they are vulnerable to gear interactions, primarily due to the bait. If offal is being discharged at the same time it will encourage seabird attendance at the vessel. While trawl vessels do not offer any attraction from bait, they may produce a great amount of offal (if the vessel is a CP) and birds are attracted to the net when it is being set and retrieved. There may also be some discard of whole fish as decks and equipment are washed or fish spill overboard while the codend is being emptied. A study conducted in Alaska found that the highest numbers of seabirds were counted in plumes with macerated discards and the trend in the data is in the direction of more birds with greater discard volume (Zador and Fitzgerald 2008). In the Alaska trawl fishery, offal discards are greater in the fall and lower in the winter (Furness et al. 2007). The migratory patterns or breeding phenology of seabirds affects the number of seabirds feeding in offal discharge from vessels and are thus exposed to the risk of mortality (Zador and Fitzgerald 2008). Fishing mode and other vessel-related attributes also affect seabird attendance. One component of an Alaska 2002 pilot electronic monitoring study indicated that bird attendance around CV's was high only during setting or hauling of the net, while the net was on the surface (McElderry et al. 2004). Otherwise bird attendance was infrequent or low during towing operations; however, attendance at a "head and gut" CP was high (McElderry et al. 2004).

As noted above, seabird bycatch estimates derived from the observer species composition sample are biased low. Observer sampling focuses on catch from the codend. However, on trawl vessels, seabirds can strike net monitoring equipment, like paravanes or third wires, strike the trawl warp cables, or get caught in the net wings and thus not be brought onboard with the fish caught and are not available to the observer during the species composition sample period (Fitzgerald et al., in prep). Seabird mortality can occur due to collisions with cables running from the vessels to the net and/or net monitoring devices and via entanglement in the net. Trawl-induced seabird mortality is difficult to quantify because birds that strike the cables may fall into the water and go unobserved (Dietrich and Melvin 2007, Zador and Fitzgerald 2008). Studies in the southern hemisphere also note these additional sources of mortality in trawl fisheries (Weimerskirch et al. 2000, Sullivan et al. 2006b, Bull 2009). In the Alaskan groundfish trawl fisheries, these additional mortalities were only noted on an ad-hoc basis by observers for many years (Labunski and Kuletz 2004, Fitzgerald et al., in prep). The AFSC completed a multi-year observer special project in 2009 which compared observed seabird bycatch from the standard species composition sample to seabird mortality from a supplemental sample of trawl gear (net wings, trawl

warps, and third wires) (unpublished data in Fitzgerald et al., in press). The study showed that there were 3.5 times as many birds in the supplemental sample than in the standard sample for the 9,395 hauls observed. The supplemental sample included 6 Laysan albatross while the standard sample did not have any, although the catch rate (0.0006 birds/haul) was extremely rare. Based on this special project, in 2010 the observer program implemented standardized data recording measures for these additional sources of mortality, although the observer's ability to complete sampling for these data is constrained by matters of safety and other duties. While these data have been collected since 2010, the estimation procedures have not yet been developed so that they can be included in the annual bycatch report. However, work is underway to determine "how best to monitor and include these in annual estimates" (AFSC 2014b).

During another field study where, in addition to the standard fishery observer, a dedicated seabird observer was deployed and stationed to record these sources of mortality, the standard observer recorded only 3 seabird mortalities in 200 sampled hauls whereas the dedicated seabird observer recorded 17 seabird mortalities within 170 of these same hauls (Melvin et al. 2011). The number of birds caught varied significantly among months and among years.

Based on these studies, most birds killed by trawlers were entangled by the netsonde or third-wire cable. Cable strikes may increase due to cable visibility, location of fishery discharge relative to where the cable enters the water, type of offal discharge, and the number and extent of vessel turns, which alter the location of the cable relative to the discharge stream (Dietrich and Melvin 2007, Fitzgerald et al., in prep). Melvin et al. (2004) found that air contacts, primarily by fulmars and shearwaters, accounted for 61 percent of seabird contacts with the third wire, and these interactions were highly sensitive to wind direction relative to the direction of the vessel. In contrast, water contacts were most common with the warps as seabirds, almost exclusively northern fulmars, followed the discharge plume along the vessel under the trawl warps. Melvin et al. (2011) tested three bycatch reduction methods (third wire snatch block, warp boom, and paired streamer lines) to quantify seabird cable strikes in the eastern Bering Sea pelagic trawl fishery. During the study, Northern fulmars and short-tailed shearwaters comprised 83 percent and 15 percent of the bird species observed around the trawlers, with only one Laysan albatross occurring. That study found that deploying streamer lines at least a meter above the third-wire block and minimizing the aerial extent of the third wire reduced seabird interactions.

No short-tailed albatross takes were documented in the groundfish trawl fishery since the inception of the domestic observer program in 1990; however, fishery observers are not required to systematically monitor seabird-trawl cable interactions as part of their prescribed duties. To date on trawl vessels, none of the birds "excluded" from the annual bycatch report (e.g., additional mortalities from trawl third wire cables) have been short-tailed albatross (S. Fitzgerald, NMFS AFSC, July, 2015, Personal Communication). However, the possibility of interaction exists and research is ongoing regarding those risks at both the individual and population levels (S. Fitzgerald, NMFS AFSC, July, 2015, Personal Communication; Zador et al. 2008a; Zador et al. 2008b). Observers try to collect dead seabirds for verifying species identification and may include the bird as part of the collections made for the AFSC-managed necropsy program.

The incidental take statement in the 2003 USFWS biological opinion anticipated that two short-tailed albatross may be reported taken in association with trawl fishing activities in the BSAI and GOA areas regulated by NMFS, over the time period in which the biological opinion remains in effect (USFWS 2003b). Although there were no takes recorded when that biological opinion was rendered, USFWS

deemed it necessary to provide incidental take to the trawl fishery due to the Likely to Adversely Affect determination provided to them by NMFS. NMFS does not have any information to suggest that the situation has changed since the 2003 biological opinion (USFWS 2003b) determination except that since 2010 observers are more aware of additional sources of seabird mortality from third wire, warp cable, and other interactions and have been recording such interactions as best they can, given safety considerations and other responsibilities.

5.9.2 Indirect Effects on Short-tailed Albatross

The only non-fishery related threats listed in Section 5.7 that may occur as an indirect effect of the Alaska groundfish fisheries 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 Alaska groundfish fisheries would alter the short-tailed albatross' natural foraging strategy is unlikely given that short-tailed albatross scavenge primarily on moribund mesopelagic or meso-bathypelagic squid at the surface (Walker et al. 2015, *in press*). These indirect effects are expected to be discountable. Thus, no indirect effects from the Alaska groundfish fisheries are expected to adversely affect the short-tailed albatross.

6.0 Steller's Eider

6.1 Species Description

There are four eider species found in the Northern Hemisphere and the Steller's eider is the smallest, weighing an average of 800 grams (1.8 pounds). There are three breeding populations of Steller's eider: two in Arctic Russia and one in Alaska. The Russian breeding population consists 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 Endangered Species Act. 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.

6.2 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 1 to 8 eggs which 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 2002)

6.3 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 2002)

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.

6.4 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).

6.5 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.

6.6 Recovery Criteria

The USFWS (2002) 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 (2002) 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 (2002) 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.

6.7 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 (approximately 2,830 square miles; 733,300 hectares; 1,811,984 acres) and 1,363 km (852 miles) of shoreline.

<u>Kuskokwim Shoals</u>

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.

<u>Seal Islands</u>

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 bred 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.

6.8 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 2006).

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).

6.9 Effects of the Alaska Groundfish Fisheries

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).

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

There has been only one recorded take of Steller's eider in the BSAI or GOA groundfish fisheries, due to a vessel strike in a marine area thought to be mostly occupied by non-ESA listed birds from Russia. The Steller's eider take, in March 2014, was due to a vessel strike by a hook-and-line CP targeting Pacific cod

in NMFS reporting area 517 (S. Fitzgerald, NMFS AFSC, July 24, 2015, Personal Communication). No groundfish fisheries occur in or near the Steller's eider critical habitat. Therefore there are no direct effects from the BSAI or GOA Groundfish FMPs on the threatened Alaska-breeding population of Steller's eider or its critical habitat.

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

The USFWS (2003b) 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 (USFWS 2003b). 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, 2002). 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 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 Alaska groundfish fisheries are expected to adversely affect the Alaska-breeding population of Steller's eider or its critical habitat.

7.0 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.

7.1 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 in the vicinity of the short-tailed albatross and Steller's eider are salmon, herring, and shellfish. These fisheries may be subject to changes from one fishing season to the next. The Board of Fisheries, established under Alaska Statute 16.05.221, is authorized to adopt regulations for fisheries in State waters to establish open and closed seasons, quotas, bag limits, and fishing methods. The Board of Fisheries meets four to six times a year to consider proposed changes to fisheries regulations. The Board relies on science provided by ADF&G, public comment, and guidance from the Alaska Department of Public Safety

and Alaska Department of Law in creating regulations. Regulation announcements, news releases, and updates are available on the ADF&G Web site.[8]

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.

7.1.1 **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).

7.1.2 **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).

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

7.1.3 **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).

7.1.4 **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 targeted sockeye salmon. In 2010, a commercial herring sac roe fishery occurred in the North Alaska Peninsula (Bernard 2011).

7.2 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 (USEPA 2012). The potential effects of any future mining activity in Bristol Bay on the short-tailed albatross and Steller's eider, and their potential prey are also unknown at this time.

8.0 Conclusions

NMFS is reinitiating ESA section 7 consultation for the Alaska groundfish fisheries as authorized by the GOA and BSAI Groundfish FMPs and the parallel groundfish fisheries in State waters. 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. Two ESA-listed species are considered in this biological assessment: the endangered short-tailed albatross, and the threatened Alaska-breeding population of Steller's eider. Critical habitat has been designated for the Alaska-breeding population of Steller's eider.

NMFS has made two major modifications to the Observer Program in recent years that have improved the quality of data in the hook-and-line fisheries where short-tailed albatross take has been observed. First, in 2012 NMFS required vessel owners of hook-and-line CPs named on LLP licenses and endorsed to catch and process Pacific cod at sea with hook-and-line gear in the BSAI to select between two monitoring options: carry two observers so that all catch can be sampled, or carry one observer and use a motion-compensated scale to weigh Pacific cod before it is processed (77 FR 59053, September 26, 2012. The selected monitoring option is required to be used when the vessel is operating in either the

BSAI or GOA groundfish fisheries when directed fishing for Pacific cod is open in the BSAI, or while the vessel is fishing for groundfish under the Western Alaska CDQ Program. Second, 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 increases in observer coverage and total effort (as estimated by total hooks deployed), increase the likelihood of observing short-tailed albatross interactions in the groundfish fisheries, especially where short-tailed albatross have historically been taken. Given the increase in short-tailed albatross population, there is concern from NMFS, the Council, USFWS, and the industry that exceeding the take level from the biological opinion (USFWS 2003b) could result in an interruption to fishing prior to reinitiating consultation. Therefore, upon request by the USFWS and the Council, NMFS is reinitiating consultation to ensure that the GOA and BSAI groundfish fisheries are not likely to jeopardize the continued existence of short-tailed albatross. A summary of our conclusions and justifications are provided below.

Species	Listing Status	Fishery	Determination
Short-tailed albatross	Endangered	GOA and BSAI Groundfish	Likely to adversely affect
Alaska-breeding population of Steller's eider	Threatened	GOA and BSAI Groundfish	Not likely to adversely affect
Critical Habitat for the Alaska-breeding population of Steller's eider		GOA and BSAI Groundfish	Not likely to adversely modify

8.1 Short-tailed Albatross

Direct Effects, Hook-and-line Gear

Groundfish harvest in the Bering Sea, Aleutian Islands, and GOA has fluctuated year to year (2008 through 2014) but most gear sectors have maintained relatively consistent harvest levels. Over the years 2008 through 2014, total groundfish harvest (metric tons) in the BSAI was eight times greater than the GOA.

From 2009 through 2014, the total number of hook-and-line vessels (CVs and CPs) was greater in the GOA than the BSAI; however, the total amount (metric tons) of groundfish harvested by hook-and-line vessels was greater in the BSAI than the GOA. The primary effort of hook-and-line CPs harvesting groundfish is focused in the Bering Sea, especially along the continental shelf. The primary effort of hook-and-line CVs harvesting groundfish is focused in the GOA and Aleutian Islands, with some effort on the Bering Sea shelf. The BSAI hook-and-line CP sector is under full observer coverage, thus we can rely on observer information to estimate hook-counts. The total number of estimated hooks deployed by the BSAI hook-and-line CP sector has increased from 2010 through 2014 and was nearly 300 million hooks in 2014. The total number of estimated hooks deployed by the hook-and-line CP sector is roughly 30 times greater than the hook-and-line CV sector (greater than or equal to 40 ft LOA) in the BSAI. Preliminary model estimates show that CVs 26 ft to less than 40 ft LOA fished substantially fewer hooks than other vessel size classes. Harvest effort (metric tons) in the GOA groundfish hook-and-line fishery was greater in the CV sector than the CP sector. GOA hook-counts could not be estimated due to lower observer coverage levels.

Since 1995, 11 short-tailed albatross mortalities have been recorded in the Alaska groundfish fisheries. Therefore, the fisheries have a direct effect on short-tailed albatross. Given these historic takes, we determined that the Alaska federally managed fisheries authorized by the GOA and BSAI Groundfish FMPs and parallel groundfish fisheries in State waters are likely to adversely affect the endangered short-tailed albatross. All documented short-tailed albatross takes in the GOA and BSAI fisheries have been in the hook-and-line fisheries. Most short-tailed albatross take in Alaska waters has occurred in the BSAI Pacific cod hook-and-line CP fishery.

In the short-tailed albatross incidental take statement (USFWS 2003b), USFWS anticipated up to four short-tailed albatross could be reported taken bi-annually (every 2 years) as a result of the hook-and-line groundfish fishing activities in the BSAI and GOA areas regulated by NMFS. The Alaska groundfish fisheries have not exceeded the incidental take allowed by the incidental take statement. Because the incidental take statement for the Alaska groundfish fisheries combines short-tailed albatross take over 2 years, it is important to note that up to three short-tailed albatross have been recorded taken in a 2-year period in the BSAI Pacific cod hook-and-line fishery. The greatest number of short-tailed albatross estimated to have been taken across the entire fishery within a 2-year period was 20 (2010 through 2011; AFSC 2014b).

Short-tailed albatross takes do occur in the hook-and-line fisheries but these takes are relatively rare, especially given the number of hooks set and the amount of observer coverage in the BSAI where the takes have been recorded. The number of hooks deployed by the BSAI hook-and-line CP sector has increased from 2010 through 2014; however, 2010 had the highest estimated take of short-tailed albatross and 2011 through 2013, when more hooks were set, had fewer short-tailed albatross interactions. The premise for reinitiating consultation is the probability of observing short-tailed albatross interactions in the BSAI and GOA groundfish fisheries has increased due to increasing observer coverage and increasing short-tailed albatross population size, yet the data do not seem to indicate a concurrent increase in number of short-tailed albatross interactions. The sustained annual effect of the hook-and-line fisheries on the short-tailed albatross population given the best available data from 2004 through 2014 is 2.6 short-tailed albatross per year. Because observer coverage in the BSAI CP sector is 100 percent of fishing days (as described in Section 4.3.4), with a high percentage of hooks monitored, and with additional observer coverage in previously unobserved fisheries in the GOA due to the restructured Observer Program, we can anticipate that 3 birds may be observed and recorded taken in each calendar year, on average.

Direct Effects, Trawl Gear

No take of short-tailed albatross has been documented in the BSAI or GOA groundfish fisheries when using trawl gear (AFSC 2014b). However, the possibility of interaction exists and research is ongoing regarding those risks at both the individual and population levels (S. Fitzgerald, NMFS AFSC, July, 2015, Personal Communication; Zador et al. 2008a; Zador et al. 2008b).

Non-pelagic trawl groundfish harvest (metric tons) was greater in the CP sector than the CV sector in the BSAI; however, non-pelagic trawl groundfish harvest (metric tons) was greater in the CV sector than the CP sector in the GOA. Pelagic trawl groundfish harvest (metric tons) was greater in the CV sector than the CP sector in the BSAI and GOA.

The incidental take statement in the 2003 biological opinion anticipated two short-tailed albatross may be reported taken by the trawl fishery in the BSAI and GOA areas regulated by NMFS over the time

period in which the biological opinion remains in effect (USFWS 2003b). Although there were no takes recorded when that biological opinion was rendered, USFWS deemed it necessary to provide incidental take to the trawl fishery based on the likely to adversely affect determination provided to them by NMFS. NMFS does not have any information to suggest that the situation has changed since the 2003 biological opinion determination except that since 2010 observers are more aware of additional sources of seabird mortality from third wire, warp cable, and other interactions. No short-tailed albatross takes on trawl vessels have been recorded to date.

Indirect Effects

The only indirect effect of the Alaska groundfish fisheries 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 Alaska groundfish fisheries would alter the short-tailed albatross' natural foraging strategy is unlikely given that short-tailed albatross scavenge primarily on moribund mesopelagic or meso-bathypelagic squid at the surface (Walker et al. 2015, *in press*). These indirect effects are expected to be discountable. Thus, no indirect effects from the Alaska groundfish fisheries are expected to adversely affect the short-tailed albatross.

8.2 Steller's Eider and Steller's Eider Critical Habitat

There has been only one recorded take of Steller's eider in the BSAI or GOA groundfish fisheries, due to a vessel strike in a marine area thought to be mostly occupied by non-ESA listed birds from Russia. No groundfish fisheries occur in or near the Steller's eider critical habitat. Therefore there are no direct effects from the BSAI or GOA Groundfish FMPs 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 Alaska groundfish fisheries 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 Alaska groundfish fisheries are expected to adversely affect the threatened Alaska-breeding population of the Steller's eider or its critical habitat.

8.3 Current Seabird Bycatch Mitigation Measures

To reduce the fishery incidental take of seabirds, including the short-tailed albatross, NMFS requires the Alaska hook-and-line fisheries to employ bird avoidance techniques such as using buoy or streamer lines with performance standards specified in regulations (50 CFR 679). Streamer lines were not required until 2004 but the majority of the hook-and-line vessels had voluntarily started using them in 2002 and 2003. Work has been completed to further reduce seabird bycatch using integrated weight gear in concert with avoidance measures (Dietrich et al. 2008) and Washington Sea Grant continues their work on this topic. In an analysis of potential population impacts due to the trawl fisheries, Zador et al. (2008b) note that while fishery-related mortality had a low risk at the population level, it was still to adopt the precautionary approach and implement seabird avoidance mitigation measures.

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