INITIAL REVIEW DRAFT

Environmental Assessment/ Regulatory Impact Review

for Proposed Regulatory Amendment to allow

Halibut Retention in Sablefish Pot Gear in the BSAI

April 2018

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Abstract: This Regulatory Impact Review/ Environmental Assessment analyzes proposed management measures that would apply exclusively to the halibut (*Hippoglossus stenolepis*) and sablefish (*Anoplopoma fimbria*) individual fishing quota (IFQ) and Community Development Quota (CDQ) fishery in the Bering Sea and Aleutian Islands (BSAI). The measure under consideration would allow retention of legal-size halibut in pot gear used to fish sablefish IFQ or CDQ in the BSAI, provided the operator also holds sufficient sablefish and halibut IFQ or CDQ for that IPHC regulatory area. The purpose of this action is to allow for more efficient harvest of the halibut resource by decreasing the wastage of legal-sized halibut discarded in the BSAI sablefish pot fishery. This action is also intended to allow for the possibility of reduced whale depredation of halibut off of hook-and-line gear, by allowing operators that hold both halibut and sablefish IFQ/CDQ the opportunity to retain halibut in pot gear.

List of Acronyms and Abbreviations

ABC	acceptable biological catch
ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
AKFIN	Alaska Fisheries Information Network
BSAI	Bering Sea and Aleutian Islands
CAS	Catch Accounting System
Council	North Pacific Fishery Management Council
CP	catcher/processor
CV	catcher vessel
DPS	distinct population segment
E.O.	Executive Order
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FMP	fishery management plan
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRFA	Final Regulatory Flexibility Analysis
ft	foot or feet
GOA	Gulf of Alaska
HAL	Hook-and-line
IRFA	Initial Regulatory Flexibility Analysis
lb	pound(s)
LOA	length overall
m	meter or meters

mt	metric ton
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Protection Act
OMBNEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
Observer Program	North Pacific Groundfish and Halibut Observer Program
PBR	potential biological removal
PSC	prohibited species catch
PPA	Preliminary preferred alternative
PRA	Paperwork Reduction Act
PSEIS	Programmatic Supplemental Environmental Impact Statement
RFA	Regulatory Flexibility Act
RFFA	reasonably foreseeable future action
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation
SAR	stock assessment report
Secretary	Secretary of Commerce
TAC	total allowable catch
U.S.	United States
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	vessel monitoring system

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Executive Summary

This document analyzes proposed management measures that would apply exclusively to the commercial halibut (*Hippoglossus stenolepis*) and sablefish (*Anoplopoma fimbria*) individual fishing quota (IFQ) and Community Development Quota (CDQ) fisheries in the Bering Sea and Aleutian Islands (BSAI). The measure under consideration would allow retention of legal-size halibut in pot gear used to fish sablefish IFQ or CDQ in the BSAI, provided the operator also holds sufficient halibut IFQ or CDQ for that IPHC regulatory area. The purpose of this action is to allow for more efficient harvest of the halibut resource by decreasing the wastage of legal-sized halibut discarded in the BSAI sablefish pot fishery. This action is also intended to allow for the possibility of reduced whale depredation of halibut off of hook-and-line gear, by allowing operators that hold both halibut and sablefish IFQ/CDQ the opportunity to retain halibut in pot gear.

Purpose and Need

The Council adopted the following purpose and need statement to originate this action in October 2017.

> *Interactions with whales throughout the Bering Sea and Aleutian Islands affect the ability of sablefish and halibut quota share holders to harvest their IFQ by reducing catch per unit of effort and increasing fishing costs. Whale depredation on discarded halibut is increasing for vessels using pot gear in the sablefish IFQ fishery and vessels fishing halibut IFQ with longline gear in the BSAI. Research into developing technological solutions to deter whales and changes in fishing strategies has not resolved the problem. The problem may be addressed by revisions to current regulations that authorize pot gear as legal gear for retention of halibut in the BSAI. Allowing retention of halibut caught in pot gear in the BSAI could address the negative impacts of whale interactions on sablefish and halibut quota share holders by reducing the amount of halibut lost to whale depredation. The Council seeks to reduce the problems associated with whale depredation while minimizing gear conflicts. The Council seeks to reduce the amount of unaccounted mortality occurring due to whale depredation.*

Alternatives

The Council adopted the following alternatives for analysis in October 2017.

Alternative 1: No action

Alternative 2: Allow retention of legal-sized halibut in pot gear used to fish sablefish IFQ[1] in the BSAI, provided the IFQ holder also holds sufficient halibut IFQ for that IPHC regulatory area.

Element 1: Applies to both single pots and longline pots

Element 2: Gear retrieval

Option 1: No gear tending requirements (status quo)

[1] In October 2017 the Council stated its intent that this action would also apply to the CDQ fishery as well. The analyst will replace all "IFQ" with "IFQ and CDQ" unless Council indicates otherwise. Thus, the analysis includes both categories of quota.

Option 2: A vessel with unfished sablefish IFQ onboard cannot leave gear on the grounds untended for more than (sub-options 5-10 days)

Element 3: Limit of 9-inch maximum width of tunnel opening does not apply when vessel has unfished halibut IFQ onboard

Element 4: All vessels using pot gear to fish IFQ are required to use logbooks and VMS

NMFS will include pot gear effort and catch of IFQ species in its annual management report to the Council. The Council intends to review the effects of allowing retention of halibut in pot gear three years after implementation.

History and Description of the Proposed Action

In June 2017, the Council received a public comment letter describing a worsening situation of whale depredation of BSAI hook-and-line (HAL) gear. This prompted the Council to request a discussion paper illustrating the Council's action and coordination with IPHC if the intent of an action is to allow (1) retention of incidentally caught halibut in pot gear in the sablefish IFQ fishery, or (2) a directed BSAI halibut IFQ pot fishery. When staff produced this discussion paper in October 2017, it described the management authority, how a future amendment might occur, and some of the nuanced regulatory language that makes it difficult to open access for the "targeting" of halibut versus the "incidental" catch of halibut IFQ. At this meeting, the Council adopted a purpose and need statement, a set of alternatives, and requested this initial review analysis.

The purpose of this action is to provide for a more efficient use of the halibut resource by allowing (and requiring) the retention of legal-size halibut in pot gear used to fish BSAI sablefish IFQ or CDQ, provided adequate IFQ or CDQ is available for harvest. The IFQ or CDQ used to account for the harvested halibut would need to correspond to the appropriate IPHC regulatory area. Currently, pot gear is not authorized as a legal gear type for the retention of halibut, thus, it is required to be discarded when caught in sablefish pots in the BSAI. This has led to halibut IFQ holders essentially "fishing twice"- catching halibut once in their sablefish pots, discarding the halibut (as required by regulation) which is sometimes immediately preyed upon by killer whales, and then deploying HAL gear to harvest their halibut quota using legal gear. Furthermore, testimony from fishery participants and scientific surveys have identified killer whale depredation of HAL gear as a serious issue, as fishery participants are forced to spend more time and money to catch their halibut quota. This generates both conservation and socioeconomic concerns, as it impedes efficient use of the halibut resource.

Scope of Expected Change Under Proposed Action

The scope of the expected change under Alternative 2 is influenced by a number of factors. The first is due to the assumption that the alternative implicitly ties the retention of halibut IFQ or CDQ in pot gear to the presence of sablefish IFQ or CDQ. While the motion states, "allow retention of legal-sized halibut ***in pot gear used to fish sablefish IFQ***" (emphasis added), there is no regulatory definition for "sablefish pot gear". Thus, throughout the analysis, the analysts assume that in order to retain halibut in pot gear, someone onboard the vessel must also have access to the appropriate sablefish IFQ or CDQ. The potential pool of participants is limited when the ability to retain halibut in pot gear in the BSAI means participants must have access to both the appropriate halibut and sablefish IFQ or CDQ as well as a vessel that can safely deploy and retrieve pot gear in the BSAI. For instance, in 2016 there were only four vessels that participated in the BSAI sablefish IFQ or CDQ fishery using pot gear; in 2017 there were only six. Other participants that are most likely to take advantage of this opportunity include QS holders that have harvested their sablefish and halibut IFQ/ CDQ with HAL gear in the past, or participants in the BSAI

Pacific cod fishery, provided they also have access to or acquire sablefish and halibut quota. Given these barriers to entry, this proposed action is only expected to directly affect a limited number of vessels/ QS holders.

A second factor that will impact the scope of expected changes under the proposed action is whether the retention of halibut in the BSAI sablefish pot fishery manifests as only retention of intrinsically incidental halibut caught in sablefish pot gear or if there is more of a targeted effort to catch halibut in pot gear. Section 2.2 of the analysis explains that this distinction is not a regulatory one; halibut is an IFQ species and retention of legal-size fish is both allowed and required by those who hold the appropriate IFQ and are using legal gear. When IFQ is not onboard, halibut is a prohibited species and must be discarded. Regulations do not refer to incidentally caught, or "non-targeted," halibut but the terminology persists in discussion of the retention topic. For purposes of analysis, this document makes the distinction between halibut retention in pot gear that would be "incidental" to a sablefish fishery relative to a so-called "targeted" halibut fishery (again, assuming there would still be sablefish IFQ or CDQ available as well), because the impacts of these types of fishing are expected to be different.

Whether Alternative 2 would result in vessels targeting halibut or retaining halibut strictly as incidental to the sablefish fishery depends on the elements selected by the Council and implemented by NMFS, as well as the intent and behavior of fishery participants. If the Council does not adopt Alternative 2, Element 3 (allowing a wider tunnel opening), the design of the pot does not change, and the footprint of the fishery does not change, halibut harvested in pot gear may remain strictly incidental to the sablefish pot fishery. If the Council does allow for different sizes of tunnel openings for participants with available halibut IFQ/ CDQ (Alternative 2, Element 3), and participants change their gear and behavior to more effectively catch halibut IFQ/ CDQ with pot gear, the scope of impacts would still not be expected to be substantial (due to the limited number of expected participants); however, they would be expected to be greater.

Comparison of Alternatives for Decision-making

The following table summarizes the expected environmental and socio-economic impacts of the proposed action.

Table ES-1 Summary of alternatives and major impacts

	Alternative 1	Alternative 2	Elements
	No action: status quo	Allow retention of legal-sized halibut in pot gear used to fish sablefish IFQ in the BSAI, provided the IFQ holder also holds sufficient halibut IFQ for that IPHC regulatory area.	Element 1: Single and longline pots Element 2: Gear retrieval Element 3: Tunnel opening Element 4: Monitoring
	Environmental Impacts		
Sablefish	No changes	• No expectation that this fishery will change in location, timing, or harvest methods outside of the status quo options. • Minimal changes in amount of sablefish harvested (as IFQ/ CDQ is not fully prosecuted) or potential for some shift from harvest with HAL gear to pots. • Cumulative impact from Amend 101 (allowing sablefish pot fishing in the GOA). Additional opportunity under Alt. 2 may incentivize more participation.	• Gear retrieval requirements in Element 2 would apply to all vessels fishing sablefish IFQ/CDQ with pot gear and may add cost/ burden to operations in some situations. • Possible changes in sablefish size selectivity due to changes in tunnel opening (Element 3).
Halibut	No changes, wastage issue continues	• Decrease in wastage, as legal-sized halibut caught in pot gear would be retained by those with the quota. • Decrease in mortality due to whale depredation on HAL gear if there is a shift of some halibut harvest to pot gear. • Changes in size selectivity, as pot gear may catch smaller halibut. • Changes in fishing footprint if pots are set in areas better suited for halibut, but previously off-limits due to high whale presence. • Magnitude of all impacts depends on elements adopted and fleet behavior; if retention is limited to intrinsically incidental halibut in sablefish pots—*de minimis* impacts; if there is a targeted effort to retain halibut in pot gear—still limited, but greater impacts. • Possible cumulative impacts with halibut abundance-based management for the BSAI fisheries that use halibut prohibited species catch.	• Element 1 would provide greater ability to target halibut or conduct a mixed-species trip with option of single pots. • Possible changes in halibut size selectivity due to changes in tunnel opening (Element 3).
Pribilof Island blue king crab	No change	• Additional pot fishing within the PIHCZ could create a concern for the PIBKC, which is overfished. • While sablefish pots are not prohibited from this area, sablefish pot fishing does not typically occur in this area. • This area may be better fishing grounds for halibut. Thus, under Alt. 2, there could be increased pressure on the PHBKC stock. • If the Council adopt Alt. 2, NMFS recommends adding an element to close the PIHCZ to all pot fishing.	• Changes in the size of the tunnel opening could lead to increased crab bycatch, which could have a negative impact on PIBKC stocks (Element 3).

Bycatch	No change	• If some amount of halibut IFQ/ CDQ shifts to pot gear instead of on HAL, there could be a shift in the magnitude of bycatch, the size selectivity, and species composition of bycatch that are observed. • More pot bycatch (crab, flounder, grenadier, snails); less HAL bycatch (skates, rockfish, sculpin, Pacific cod).	• Changes in the tunnel openings could lead to changes in the amount and size of bycatch (Element 3).
Marine Mammals	No change	• Possible decrease in prey for killer whales; however, this does not represent a natural foraging behavior and is not expected to negatively affect the population. • Possible decrease in interactions (risk of vessel strike, etc) with resident killer whales and HAL fishery if some level of shift from halibut caught in pot gear rather than HAL.	• Use of single pots may slightly increase the risk of gear entanglement issues with wright whales (Element 1).
Seabirds	No changes	• As HAL typically has more interactions with seabird than pot gear, small potential to minimize gear interactions if there is some level of shift to pots.	
	Socio-economic Impacts		
Distributional impacts on harvesters	No change (Continue to incur fishing costs due to "double-fishing" and whale depredation)	• Greater flexibility and efficiency for QS holders with both sablefish and halibut IFQ/ CDQ to fish opportunistically. • Decrease in variable costs incurred to avoid whales.	• Ability to use single pots and ability to adjust tunnel openings (Elements 1 and 3) may provide greater ability to target halibut or conduct a mixed-species trip with option of single pots. • Gear retrieval requirements and increased monitoring (Elements 2 and 4) may increase the costs to prosecute fishery in some situations.
Distributional impacts on processors / port communities	No changes	• Not expected that the value or distribution of landings of sablefish would change. • Limited change expected in the value of halibut landed (could be a decrease if more landed frozen); there could be some small distributional changes in halibut landings, lining up with where pot sablefish are landed. • Scope of change on processors and communities is likely to be limited due to expected number of participants and small number of BSAI processors accepting halibut/ sablefish.	
Impacts on CDQ groups	No change	• Not expected to directly affect residents of CDQ groups, as groups are still responsible for determining how to use their quota. • Many of the vessels owned by CDQ residents are 32 ft or less and are therefore not likely to switch to pot gear. • Halibut or sablefish CDQ leased out to a non-resident would have the same ability under Alt. 2 as proposed for IFQ.	
Potential negative impacts	No changes	• Alt. 2 would create a *requirement* to retain legal-sized halibut when someone on board has the appropriate IFQ or CDQ. There may be situation where a participant sees this as a burden.	

1 Introduction

This document analyzes proposed management measures that would apply exclusively to the commercial halibut (*Hippoglossus stenolepis*) and sablefish (*Anoplopoma fimbria*) individual fishing quota (IFQ) and Community Development Quota (CDQ) fisheries in the Bering Sea and Aleutian Islands (BSAI). The measure under consideration would allow retention of legal-size halibut in pot gear used to fish sablefish IFQ or CDQ in the BSAI, provided the operator also holds sufficient sablefish and halibut IFQ or CDQ for that IPHC regulatory area. The purpose of this action is to allow for more efficient harvest of the halibut resource by decreasing the wastage of legal-size halibut discarded in the BSAI sablefish pot fishery. This action is also intended to allow for the possibility of reduced whale depredation of halibut on hook and line gear by allowing operators that hold both halibut and sablefish IFQ/CDQ the opportunity to retain halibut in pot gear.

This document is an Environmental Assessment/ Regulatory Impact Review (EA/RIR). An EA/RIR provides the assessments of the environmental impacts of an action and its reasonable alternatives (the EA) and the social and economic benefits and costs of the action alternatives, as well as their distribution (the RIR). This EA/RIR addresses the statutory requirements of the Magnuson Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, and Presidential Executive Order 12866. An EA/RIR is a standard document produced by the North Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) Alaska Region to provide the analytical background for decision-making.

1.1 Purpose and Need

The Council adopted the following purpose and need statement to originate this action in October 2017.

> *Interactions with whales throughout the Bering Sea and Aleutian Islands affect the ability of sablefish and halibut quota share holders to harvest their IFQ by reducing catch per unit of effort and increasing fishing costs. Whale depredation on discarded halibut is increasing for vessels using pot gear in the sablefish IFQ fishery and vessels fishing halibut IFQ with longline gear in the BSAI. Research into developing technological solutions to deter whales and changes in fishing strategies has not resolved the problem. The problem may be addressed by revisions to current regulations that authorize pot gear as legal gear for retention of halibut in the BSAI. Allowing retention of halibut caught in pot gear in the BSAI could address the negative impacts of whale interactions on sablefish and halibut quota share holders by reducing the amount of halibut lost to whale depredation. The Council seeks to reduce the problems associated with whale depredation while minimizing gear conflicts. The Council seeks to reduce the amount of unaccounted mortality occurring due to whale depredation.*

1.2 History of Related Action

The Council has discussed actions related to the current proposal in the past. Previous actions involved proposals to allow halibut retention in sablefish pot gear; however, no other action suggested halibut retention in pot gear for the whole BSAI, and no other proposal presented the possibility of targeting halibut IFQ with pot gear.

The issue of halibut retention in BSAI sablefish pots was first presented to the Council in 2009, when a request to allow retention in Area 4A was forwarded from the IPHC. At that time, the use of pots for sablefish fishing was only allowed in the BSAI, and retention of halibut caught in pot gear was not allowed in any of the Alaska region's state or federal waters. The Council and its IFQ Implementation

Committee reviewed a staff discussion paper in December 2012, at which point the Council identified four additional topics to be explored before it would consider a recommendation that the IPHC amend its regulations to allow halibut retention in sablefish pots (NPFMC 2012). Those topics were addressed in an April 2013 discussion paper; they included the spatial and temporal overlap of halibut longline and sablefish pot fishing effort, the need for gear retrieval and gear specification regulations, information on the physical condition of halibut incidentally caught in sablefish pots, and a review of lessons learned from allowing halibut retention in sablefish pots on the west coast (Areas 2A and 2B) (NPFMC 2013).

At that point, the Council and IPHC exchanged letters in September 2013 and February 2014 where the Council recommended halibut retention and the IPHC supported further analysis that included measures to limit retention to only incidental amounts; this correspondence is detailed in Section 2.1 of an April 2015 Council discussion paper with the letters themselves in that appendix (NPFMC 2015a). The IPHC determination at the time was that retention in Area 4A should be contingent on management measures to cap incidental catch (e.g., maximum retainable amounts (MRA)). This determination was presented to the Council as a policy choice guided by a desire to preserve the hook-and-line characteristic of the existing IFQ halibut fleet. The IPHC did not oppose retention from a biological perspective but had some concerns about gear conflict and potential disadvantage to vessels that were too small or otherwise unable to switch from longline to pot gear.

The discussion paper the Council produced in April 2015 on Area 4A retention (NPFMC 2015a) scoped alternatives, including ones that would limit the amount of halibut that could be retained. Upon review, the Council tabled further consideration for the following reasons: (1) the Council did not feel that it had sufficient data on which to base an MRA; (2) only a small number of vessels were active in the Area 4A sablefish pot fishery, and those vessels were not requesting urgent action on retention at the time; (3) the Council was simultaneously working towards an action to allow longline sablefish pots in the GOA with an option to allow retention of incidentally caught halibut (NPFMC 2016; Am. 101), and the Council did not want to push for the IPHC to allow retention in 4A without first knowing how coordination on the GOA action would resolve. The last point reflects the Council's wish not to create a "patchwork" of retention regulations across areas, with retention allowed in Area 4A but not in the GOA.

Ironically, that patchwork did emerge, but with retention allowed in the GOA and not the BSAI. The Council finalized GOA Am. 101 with a provision to allow incidentally caught halibut but took no action in Area 4A (or the rest of Area 4 that overlaps the BSAI groundfish management area). In November 2015, the Council wrote a letter to the IPHC requesting an amendment to make pot gear legal gear for halibut in IPHC areas overlapping the GOA.[2] The Council did not define "incidental," but in its letter assured the IPHC that it would monitor the amount and size of halibut caught in GOA sablefish pots so that it would be equipped with the information necessary to limit retention should it become an issue for the IPHC in the future. The Council also provided a December 2015 discussion paper that summarizes the entire process dating back to 2009 and catalogues all associated correspondence.[3]

The IPHC responded favorably to the Council's request and, at its January 2016 Annual Meeting, took action to make pot gear legal for halibut retention in all areas off Alaska. This action reflected the IPHC's acceptance of the Council's good-faith commitment to monitor the incidental nature of halibut bycatch and take action in the future if necessary. Just as importantly, it was also an acknowledgement of the worsening challenge of whale depredation and its effect on both the resource and the halibut and sablefish longline fleets. However, because the Council and NMFS had tabled the retention action in the

[2] http://npfmc.legistar.com/gateway.aspx?M=F&ID=8bc9eb92-da18-4e5d-883d-10b8f8014428.pdf

[3] http://npfmc.legistar.com/gateway.aspx?M=F&ID=7d531a12-e2df-4f1c-b22f-29df93f5422a.pdf

BSAI/Area 4A overlap, the IPHC's sweeping regulation change created a new round of mismatched retention regulations.

1.2.1 BSAI Sablefish Pots

In June 2017, the Council received a public comment letter describing a worsening situation of whale depredation of BSAI longline gear.[4] This prompted the Council to request a discussion paper illustrating the Council's action and coordination with IPHC if the intent of an action is to allow (1) retention of incidentally caught halibut in pot gear in the sablefish IFQ fishery, or (2) a directed BSAI halibut IFQ pot fishery. When staff produced this discussion paper in October 2017, it described the management authority, how a future amendment might occur, and some of the nuanced regulatory language that makes it difficult to open access for the "targeting" of halibut versus the "incidental" catch of halibut IFQ (NPFMC 2017a). At this meeting, the Council adopted a purpose and need statement, a set of alternatives, and requested this initial review analysis.

1.2.2 Recent Action by the IPHC

At its annual meeting in January 2018, the IPHC received a proposal[5] to amend its regulations to allow the retention of halibut in pot gear in the BSAI. This proposal highlighted two key changes. The first, (included as Alternative 2, Element 1 in the present analysis), is for the IPHC to permit the use of single pots as well as longline pot gear for the harvest of halibut IFQ. The proposal says, "for some smaller vessels that might fish for sablefish and retain halibut, longline pot gear is too large and heavy, while single pot gear is more usable." The second proposed change would separate the ability to harvest halibut in pot gear in the BSAI from the sablefish fishery. The present analysis (Alternative 2) considers allowing the retention of halibut in pots used in the IFQ sablefish fishery, as discussed in Section 2.2, requiring operators to have access to both types of quota (halibut and sablefish IFQ or CDQ). The proposal submitted to the IPHC requests the ability to use pot gear to fish for halibut in the BSAI, regardless of the sablefish IFQ or CDQ held.

The IPHC Secretariat supported the regulatory proposal, stating that the primary concern was that any Pacific halibut caught in pots on the trip are tracked and reported. The IPHC Secretariat proposed the following regulatory amendment; a simplified version from the original proposal, but consistent with the intent.[6]

> ***19. Fishing Gear***
>
> *(1) No person shall fish for halibut using any gear other than hook and line gear,*
>
> > *(a) except that vessels licensed to catch sablefish in Area 2B using sablefish trap gear as defined in the Condition of Licence can retain halibut caught as bycatch under regulations promulgated by DFO; or*
> >
> > *(b) except that a person may retain halibut taken with longline* ***or single*** *pot gear ~~in the sablefish IFQ fishery~~ if such retention is authorized by NMFS regulations published at 50 CFR Part 679.*

[4] http://npfmc.legistar.com/gateway.aspx?M=F&ID=9aa7f499-9b0c-4eb9-9685-ecc126cab44d.pdf
[5] See proposal: https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-propc13.pdf
[6] See IPHC Secretariat comments: https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-23.pdf

(2) No person shall possess halibut taken with any gear other than hook and line gear,

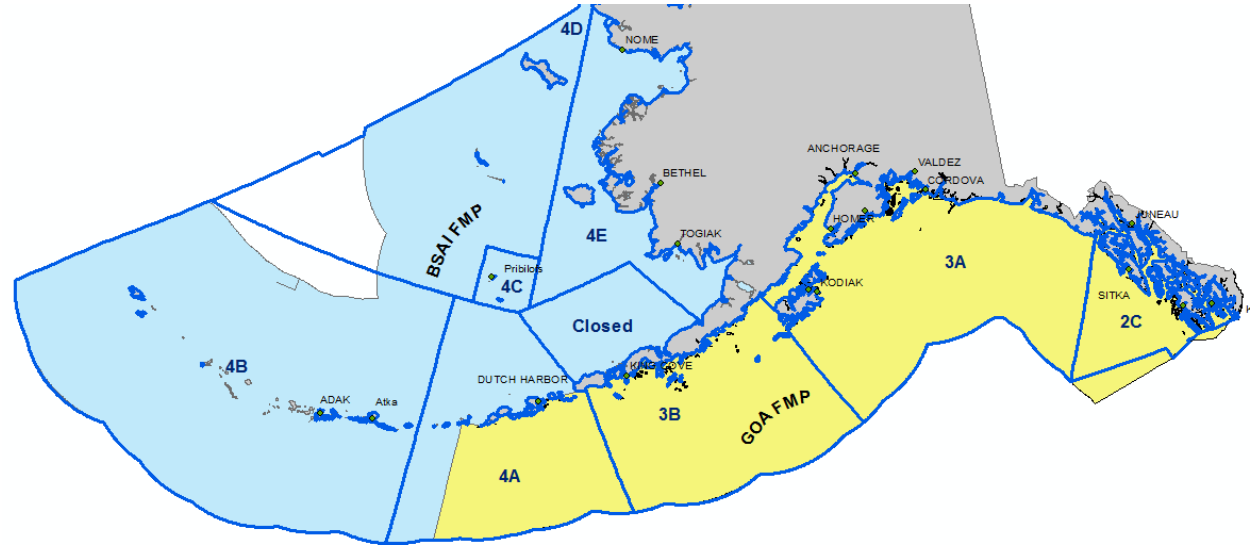
> *(a) except that vessels licensed to catch sablefish in Area 2B using sablefish trap gear as defined by the Condition of Licence can retain halibut caught as bycatch under regulations promulgated by DFO; or*
>
> *(b) except that a person may possess halibut taken with longline* ***or single*** *pot gear ~~in the sablefish IFQ fishery~~ if such possession is authorized by NMFS regulations published at 50 CFR Part 679. …*

The IPHC adopted the Secretariat's suggested regulatory text for 2018 regulations. Since the IPHC regulatory text continues to reference NMFS regulations, retention of halibut in BSAI pot gear will be prohibited unless the NMFS regulations are modified. If there is an amendment to the US Federal regulations, there would likely not need to be any changes to IPHC regulations to allow the retention of halibut in pot gear in the BSAI.

1.3 Description of Management Area

Figure 1 shows an overlay of the NMFS groundfish management areas that are referred to in Federal regulations and the Council's FMPs, and the IPHC areas for waters off Alaska. Halibut retention in sablefish pots is currently permitted in the GOA, but not the BSAI. Note that IPHC Area 4A encompasses parts of both the BSAI and GOA. The previous section (Section 1.2) describes an action that was previously considered to allow halibut retention in the parts of 4A that overlap the BSAI. That action was not completed.

Figure 1 Overlay of Federal groundfish Fishery Management Plan (FMP) areas (BSAI (blue) and GOA (yellow)) with IPHC regulatory areas



2 Description of Alternatives

NEPA requires that an EA analyze a reasonable range of alternatives consistent with the purpose and need for the proposed action. The action alternative in this chapter was designed to accomplish the stated purpose and need for the action. The action alternative was designed to allow for more efficient harvest of the halibut resource by decreasing the wastage of legal-sized halibut discarded in the BSAI sablefish pot fishery. This action is also intended to allow for the possibility of reduced whale depredation of halibut off of hook-and-line gear, by allowing operators that hold both halibut and sablefish IFQ/CDQ the opportunity to retain halibut in pot gear.

The Council adopted the following alternatives for analysis in October 2017.

Alternative 1: No action

Alternative 2: Allow retention of legal-sized halibut in pot gear used to fish sablefish IFQ[7] in the BSAI, provided the IFQ holder also holds sufficient halibut IFQ for that IPHC regulatory area.

Element 1: Applies to both single pots and longline pots

Element 2: Gear retrieval

Option 1: No gear tending requirements (status quo)

Option 2: A vessel with unfished sablefish IFQ onboard cannot leave gear on the grounds untended for more than (sub-options 5-10 days)

Element 3: Limit of 9-inch maximum width of tunnel opening does not apply when vessel has unfished halibut IFQ onboard

Element 4: All vessels using pot gear to fish IFQ are required to use logbooks and VMS

NMFS will include pot gear effort and catch of IFQ species in its annual management report to the Council. The Council intends to review the effects of allowing retention of halibut in pot gear three years after implementation.

2.1 Alternative 1, No Action

Under regulatory status quo, U.S. Federal regulations authorize all pot gear (i.e., longline pots and single pots) for sablefish harvest from any BSAI reporting area (§679.2). However, the only authorized fishing gear for halibut harvested from any IFQ regulatory area includes "…fishing gear composed of lines with hooks attached, including one or more stationary, buoyed, and anchored lines with hooks attached" (§679.2). The Federal regulations go on to make an exception for halibut harvested using all longline pot gear in any GOA reporting area. There is no such exception for pot gear in the BSAI (or IPHC regulatory Area 4). Thus, under status quo, all halibut caught while fishing for sablefish with pot gear in the BSAI must be discarded.

[7] In October 2017 the Council stated its intent that this action would also apply to the CDQ fishery as well. The analyst will replace all "IFQ" with "IFQ and CDQ" unless Council indicates otherwise. Thus, the analysis includes both categories of quota.

In the sablefish hook-and-line (HAL) fishery, participants who also hold halibut IFQ are required to retain halibut that are 32 inches or greater in length (legal-size) harvested in the sablefish IFQ fishery, provided they have remaining halibut IFQ. This regulation was implemented with the IFQ Program in 1995 and is intended to promote full utilization of halibut by reducing discards of halibut caught incidentally in the sablefish IFQ fishery.

2.2 Alternative 2, Allow Halibut Retention in Sablefish Pot Gear in the BSAI

The action alternative would allow (and require) the retention of legal-size halibut in pot gear used to fish BSAI sablefish IFQ or CDQ, provided adequate IFQ or CDQ is available for harvest. The IFQ or CDQ used to account for the harvested halibut would need to correspond to the appropriate IPHC regulatory area.

Analysts have identified several points for clarification under Alternative 2.

How should the retained halibut be linked to sablefish pot gear? The language of Alternative 2 ties the opportunity (and requirement) to retain halibut IFQ/CDQ caught in pot gear to the sablefish IFQ/ CDQ fishery. There is no regulatory definition for "sablefish pot gear". Pot gear is defined in Federal regulations in §679.2 to mean:

> *a portable structure designed and constructed to capture and retain fish alive in the water. This gear type includes longline pot and pot-and-line ~~gear~~. Each groundfish pot must comply with the following:*
>
> *(i) Biodegradable panel. Each pot used to fish for groundfish must be equipped with a biodegradable panel at least 18 inches (45.72 cm) in length that is parallel to, and within 6 inches (15.24 cm) of, the bottom of the pot, and that is sewn up with untreated cotton thread of no larger size than No. 30.*
>
> *(ii) Tunnel opening. Each pot used to fish for groundfish must be equipped with rigid tunnel openings that are no wider than 9 inches (22.86 cm) and no higher than 9 inches (22.86 cm), or soft tunnel openings with dimensions that are no wider than 9 inches (22.86 cm).*

Therefore, there would be no way to enforce only allowing retention *in sablefish pot gear*. The analysts assume the intention of Alternative 2 is to tie the ability to harvest halibut with pot gear to an amount of sablefish IFQ or CDQ on the vessel. The motion does not state that a minimum *amount* of sablefish quota is needed to retain halibut in pot gear. Section 4.7.6 further describes challenges with enforcing this type of link between the sablefish and halibut pot fisheries, and OLE's recommendations regarding this action.

Is the intent to allow participants to target halibut with pot gear? The motion also does not explicitly state whether the harvest of halibut in pots could be a targeted effort or if it would be limited to the incidental harvest of halibut alongside a sablefish pot fishery. The following language in the Council's purpose and need statement does not specifically imply that halibut retention must occur incidentally to the sablefish fishery: "*The problem may be addressed by revisions to current regulations that authorize pot gear as legal gear for retention of halibut in the BSAI. Allowing retention of halibut caught in pot gear in the BSAI could address the negative impacts of whale interactions on sablefish and halibut quota share holders by reducing the amount of halibut lost to whale depredation.*" Furthermore, Elements 1 and 3—the ability to use single pots, and the exemption from the 9-inch maximum opening—could make effort to harvest halibut IFQ or CDQ alongside sablefish IFQ/CDQ more effective.

While necessary to the discussion of retaining halibut in a sablefish fishery, the terms "incidental," "targeted," and "directed" are not used in the Federal regulations for the halibut IFQ fishery. Halibut is an IFQ species and retention of legal-size fish is both allowed and required by those who hold the appropriate IFQ and are using legal gear. When IFQ is not onboard, halibut is a prohibited species and must be discarded. Regulations do not refer to incidentally caught, or "non-targeted," halibut but the terminology persists in discussion of the retention topic.

Similarly, the public discourse has often included the term "directed" halibut fishing. The concept of "directed" fishing for an IFQ species does not appropriately fit with the management of the IFQ fishery as described in Federal regulations. Directed fishing in a Federal groundfish fishery means that NMFS Catch Accounting System assigns a "trip target" after the fact based on the preponderance of the delivered catch. Unlike Federal groundfish fisheries, vessels fishing in IFQ fisheries are not directed fishing and do not have a target; rather, they simply fish and retain fish for which they are using legal gear and possess the necessary IFQ to cover their catch. Sometimes the use of the word "target" is unavoidable in discussion of the topic but in an IFQ context it should not be read to reflect anything other than the species that a fisherman is trying to catch on a specific trip or haul, and not relative to the amount of any other species.

Defining these terms is not merely a semantic exercise. When an objective to retain only incidentally caught halibut is raised, discussion naturally flows toward a maximum retainable amount (MRA). In fisheries that NMFS manages as directed fisheries with trip targets assigned, an MRA is a cap on the proportion of the fish retained onboard a vessel that are non-target species. Because there is no trip target and no definition of incidental catch for IFQ species, the concept of MRAs is not a good fit for sablefish and halibut IFQ fishing in terms of its use in Federal regulations.

In both the environmental and socio-economic analyses, this document makes the distinction between halibut retention in pot gear that would be incidental to a sablefish fishery relative to a so-called targeted fishery because the impacts of these types of fishing are expected to be different. However, the distinction will not be defined in Federal regulations given the relationship of the terms to the IFQ fishery as previously described. Whether Alternative 2 would result in vessels specifically targeting halibut or retaining halibut as incidental to sablefish depends on the elements decided upon by the Council and implemented by NMFS, as well as the intent and behavior of the participants.

Whether a vessel is targeting halibut or targeting sablefish is not something that enforcement representatives can easily determine when boarding a vessel (further discussed in Section 4.7.6.1). An enforcement officer looks for available IFQ or CDQ and appropriate permits. Currently retention of both halibut and sablefish is allowed (and required) on HAL vessels, when participants on board have the appropriate IFQ. Enforcement does not identify the trip "target" but checks for the appropriate IFQ.

Details of Elements Under Alternative 2 and Points for Clarification

Element 1 under Alternative 2 states that the ability to retain halibut IFQ/CDQ in pot gear would apply for both single pot and longline pot configurations. This means that participants would have the flexibility to choose the type of pot configuration that best fits their fishing practice and vessel, as is the case currently in the BSAI sablefish pot fishery. Note that only longline pots are permitted to harvest either halibut or sablefish IFQ in GOA. Adopting this element would clarify that the status quo of gear flexibility would persist in the BSAI, even when halibut IFQ/CDQ is being harvested. If the Council wishes to clarify that there is not an option being considered here, it could remove Element 1 and revise the language of Alternative 2 to read: "Allow retention of legal-size halibut in **single or longline** pot gear used to fish sablefish IFQ in the BSAI, provided the IFQ holder also holds sufficient halibut IFQ for that IPHC regulatory area" (bold words added).

Element 2 of the action alternative is whether to add gear retrieval requirements to the BSAI sablefish pot fishery. Option 1 under Element 2 is status quo for the BSAI sablefish pot fishery: no gear tending requirements. Option 2 would require removing pot gear from the fishing grounds after five to ten days (sub-options), if the vessel has unfished sablefish IFQ or CDQ onboard. *The Council may wish to clarify what it means to possess "unfished" sablefish IFQ and if that would include de minimis amounts*. Section 4.7.6 further discusses this element, including implementation and enforcement challenges.

Element 3 would exempt vessels that are fishing sablefish IFQ/CDQ from the requirement to have a tunnel opening no wider than 9 inches. Section 4.7.4 describes this element.

Element 4 describes monitoring requirements for vessels using pot gear to fish IFQ, including the requirements to use logbooks and VMS in Section 4.7.6.3. There are several types of logbooks, including a Daily Fishing Logbook (DFL) required by NMFS (§679.5) and an IPHC logbook. The analysts assume the Council's intent for this element is to require all vessels fishing sablefish or halibut IFQ/CDQ with pot gear to complete the DFL. *The Council may wish to clarify this intent.* Note that all these vessels will already be completing an IPHC logbook in addition to a DFL, if 26 ft length overall (LOA) or greater. Section 4.7.6.3 explains the qualification criteria for each.

Finally, the motion includes a request that NMFS would include pot gear effort and catch of IFQ species in its annual management report to the Council and a policy statement that the Council intends to review the effects of allowing retention of halibut in pot gear three years after implementation.

2.3 Comparison of Current and Proposed Regulations

For reference, Table 1 provides a comparison of the relevant regulations in the GOA sablefish pot fishery, the status quo regulations of the BSAI sablefish pot fishery (Alt. 1), and the proposed regulatory changes under the action alternative and elements allowing retention of halibut in BSAI sablefish pot gear (Alt. 2).

Table 1 Comparison of GOA sablefish pot regulations, current BSAI sablefish pot regulations, and regulations for BSAI sablefish pots under the proposed action

Note: this document is not comprehensive for all regulations but includes those which are relevant to this action.	**Current BSAI sablefish pot gear (Alt 1, No action)**	**BSAI halibut retention proposal (Alt 2, allow halibut retention)**	**Current GOA sablefish pot gear**
<u>Alternative:</u> Halibut retention	• Retention of halibut in pots is allowed by IPHC, but defers to NMFS regulations • No retention of halibut in pots allowed by NMFS	Allow (require) retention of legal-sized halibut in pot gear, if operator holds appropriate quota	Vessel operators must retain legal-size halibut (32 inches or greater) caught in longline pot gear while fishing sablefish IFQ if an IFQ permit holder on board the vessel has unused halibut IFQ for the appropriate IFQ regulatory area and vessel category.
<u>Element 1:</u> # pots per line (single vs longline pot gear)	Longline or single are allowed, IPHC defers to NMFS regulations	Allow the use of both single pots and longline pots.	Longline pot gear only. Pot-and-line (single pot) gear is prohibited.

Note: this document is not comprehensive for all regulations but includes those which are relevant to this action.	**Current BSAI sablefish pot gear (Alt 1, No action)**	**BSAI halibut retention proposal (Alt 2, allow halibut retention)**	**Current GOA sablefish pot gear**
Element 2: **Gear tending/retrieval requirements**	• No gear tending requirements	Option 1: No gear tending requirements (status quo) Option 2: A vessel with unfished sablefish IFQ onboard cannot leave gear on grounds untended for more than (sub-options) 5-10 days.	§679.42(l)(5)(iii) establishes gear retrieval requirements by area that require gear to be redeployed within a certain amount of time after being deployed (SEO CPs 5 days; WY/CGOA CV/CPs 5 days; WGOA CV/CPs 7 days). SEO CVs must remove the gear from the fishing grounds when making a sablefish landing.
Element 3: **Tunnel openings**	• *Each* pot must be equipped with rigid tunnel openings that are no wider than 9 inches and no higher than 9 inches, or soft tunnel openings with dimensions that are no wider than 9 inches.	Limit of 9-inch maximum width of tunnel opening does not apply when vessel has unfished halibut IFQ onboard	*Each* pot must be equipped with rigid tunnel openings that are no wider than 9 inches and no higher than 9 inches, or soft tunnel openings no wider than 9 inches.
Element 4: **Logbook reporting & VMS**	• All CPs (any length) and all CVs 60ft and greater with a FFP using longline or pot gear to harvest sablefish are required to maintain a logbook. • CVs less than 60 ft using longline pot gear to harvest groundfish must use logbooks. • All vessels must possess a transmitting VMS while fishing for IFQ sablefish. Must comply with VMS requirements at §679.28(f)(3), (f)(4), and (f)(5). • Operator must receive a VMS confirmation number at least 72 hours prior to fishing for IFQ sablefish in BSAI. • Regulations for VMS vary for CDQ.	Continue with BSAI status quo- update regulatory language to the following: • Vessels using pot gear to fish IFQ & CDQ must use logbooks and possess a transmitting VMS transmitter. Must comply with VMS requirements at §679.28(f)(3), (f)(4), and (f)(5).	• All vessels using pot gear to fish IFQ are required to use daily fishing logbooks (DFLs) & VMS. • Operator must possess a transmitting VMS transmitter while fishing for sablefish. The operator must comply with VMS requirements at §679.28(f)(3), (f)(4), and (f)(5). • Operator must receive a VMS confirmation number at least 72 hours prior to using longline pot gear to fish for IFQ sablefish. • Vessel operators must complete a longline and pot gear DFL or Daily Cumulative Production Logbook (DCPL) as specified in §679.5(c).
Biodegradable panels	At least 18 inches in length that is parallel to, and within 6 inches of, the bottom of the pot, and that is sewn up with untreated cotton thread of no larger size than No. 30.	Continue with BSAI status quo	At least 18 inches in length that is parallel to, and within 6 inches of, the bottom of the pot, and that is sewn up with untreated cotton thread of no larger size than No. 30.

Note: this document is not comprehensive for all regulations but includes those which are relevant to this action.	**Current BSAI sablefish pot gear (Alt 1, No action)**	**BSAI halibut retention proposal (Alt 2, allow halibut retention)**	**Current GOA sablefish pot gear**
Pot per vessel limit	No limits in BSAI	Continue with BSAI status quo- no limits	At §679.42(l)(5), a vessel operator is limited to deploying a specific number of pots in each area in which they will be fishing IFQ sablefish. (EGOA: 120 pots; C/WGOA: 300 pots).
Gear switching	Vessel operator may deploy pot gear and longline gear for sablefish IFQ during the same fishing trip. Other regulations at 50 CFR Part 679 apply.	Continue with BSAI status quo	Vessel operator may deploy pot gear and longline gear for sablefish IFQ during the same fishing trip. Other regulations at 50 CFR Part 679 apply.
Pot tags, gear marking, Prior Notice of Landing (PNOL)	• **PNOL:** §679.5, 3 hours • Pot tags not required • Marker buoys not required	Continue with BSAI status quo	• **PNOL:** §679.5, 3 hours • Pot tags are required (§679.42(l)(3)). • §679.24(a)(3) requires marking longline pot gear marker buoys. This requirement is in addition to current requirements at §679.24(a)(1) and (2).
Sablefish size restrictions	Full retention	Continue with BSAI status quo	Full retention

2.4 Regulatory Amendments Necessary for Proposed Action

IPHC Regulations

Alternative 2 would allow retention of legal-size halibut in pot gear used to fish sablefish IFQ or CDQ in the BSAI, provided the operator also holds sufficient halibut IFQ or CDQ for that IPHC regulatory area. Note that the IPHC has already taken complementary action amending its 2018 regulations to allow for the retention, as well as the possession, of halibut taken with longline or single pot gear *if such retention is authorized by NMFS regulations published at 50 CFR Part 679* (emphasis added).

This broad action taken by the IPHC means that no changes to IPHC regulations may be needed to implement any of the proposed Alternative 2. The language adopted by the IPHC is more flexible than the action currently being considered in Alternative 2. Alternative 2 is qualified by the language "allow retention of legal-size halibut in *pot gear used to fish sablefish IFQ in the BSAI*…." (emphasis added). As stated, the analysts assume that the ability and requirement to retain halibut in pot gear in the BSAI is tied to the presence of sablefish IFQ or CDQ, as well as having the appropriate halibut IFQ or CDQ.

U.S. Federal Regulations

Additional Federal regulations that are not in conflict with approved IPHC regulations may be recommended by the Council and implemented by the Secretary. Thus, the Council could continue to consider and ultimately recommend tying the opportunity to harvest halibut in the BSAI with pot gear to

the sablefish fishery. Or the Council could consider allowing this new gear type for halibut without the qualification of sablefish quota.

Either way, action to allow any type of halibut retention will require an amendment to U.S. Federal regulations. As stated in Section 2.1, Federal regulations define authorized fishing gear at §679.2, allowing halibut harvested using all longline pot gear in any GOA reporting area, but in the BSAI, only hook-and-line gear is permitted. Regulations would need to be revised by striking the language referring to the GOA if the Council wants to allow halibut retention in BSAI sablefish pots.

This action would revise regulations at §679.5 to require all vessels, including vessels less than 60 ft. LOA, using pot gear in the BSAI sablefish IFQ fishery to report information on fishery participation in logbooks, forms, and eLandings.

NMFS currently requires vessels in the BSAI to have an operating VMS on board the vessel while participating in the sablefish IFQ fishery at § 679.28. This action would revise regulations to extend this requirement to all vessels using pot gear in the halibut and sablefish IFQ fishery.

BSAI Groundfish Fishery Management Plan

The current proposed action under Alternative 2 would not require an amendment to the BSAI Groundfish Fishery Management Plan (FMP). If the Council includes an element to consider closing the PIHCZ to all pot fishing (including sablefish and halibut), this may require an FMP amendment.

ADF&G Regulations

The State of Alaska, Alaska Department of Fish and Game (ADF&G) has one primary regulation pertaining to commercial take of halibut that essentially states halibut may not be taken or possessed for commercial use in a way that is inconsistent with IPHC regulation. Therefore, depending on other management measures the Council considers, ADF&G regulations might not need to be amended.

However, if the Council adopts Alternative 2, there may be a disconnect between the Federal regulations for the sablefish fishery and the Aleutian Islands state water fishery. Namely, vessels could retain halibut in pots in federal waters but not in state waters. Additionally, if the Council adopts gear tending requirements under Alternative 2, Element 2, there may be inconsistency across jurisdictions, as the AI state waters fishery does not currently have any gear tending requirements. The AI state water seasons occur simultaneously with the Federal season; therefore, this may add to confusion and potential enforcement issues. There is no state waters sablefish fishery in the Bering Sea.

3 Environmental Assessment

There are four required components for an environmental assessment. The need for the proposal is described in Section 1, and the alternatives in Section 2. This chapter addresses the probable environmental impacts of the proposed action and alternatives. A list of agencies and persons consulted is included in Section 6.

This chapter evaluates the direct, indirect, and cumulative impacts of the alternatives and options on the various resource components. The socio-economic impacts of this action are described in detail in the Regulatory Impact Review (RIR) of this analysis (Section 4).

Recent information necessary to understand the affected environment for each resource component is summarized in the relevant section. For each resource component, the analysis identifies the potential impacts of each alternative. If significant impacts are likely to occur, preparation of an EIS is required. Although an EA should evaluate economic and socioeconomic impacts that are interrelated with natural and physical environmental effects, economic and social impacts by themselves are not sufficient to require the preparation of an EIS (see 40 CFR 1508.14).

An environmental assessment must consider cumulative effects when determining whether an action significantly affects environmental quality. The Council on Environmental Quality (CEQ) regulations for implementing NEPA define cumulative effects as:

> *"the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7*).

The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed if evaluating each action individually. Concurrently, the Council on Environmental Quality (CEQ) guidelines recognize that it is most practical to focus cumulative effects analysis on only those effects that are truly meaningful.

3.1 Documents Incorporated by Reference in this Analysis

This EA relies heavily on the information and evaluation contained in previous environmental analyses, and these documents are incorporated by reference. The documents listed below contain information about the fishery management areas, fisheries, marine resources, ecosystem, social, and economic elements of the groundfish fisheries. They also include comprehensive analysis of the effects of the fisheries on the human environment and are referenced in the analysis of impacts throughout this chapter.

Environmental Assessment/Regulatory Impact Review for Amendment 101 to the FMP for Groundfish of the GOA: Allow the use of pot longline gear in the GOA sablefish IFQ fishery (NMFS 2015).

The Amendment 101 EA analyzed proposed management measures that would allow a new gear type to harvest sablefish in the GOA. The Amendment 101 summarizes the evaluations rendered for fisheries, marine resources, and ecosystem components and is referenced in this EA. This document is available from:

https://alaskafisheries.noaa.gov/sites/default/files/analyses/goa101earir.pdf

Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007).

This EIS provides decision makers and the public an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and the BSAI management areas and is referenced here for an understanding of the groundfish fishery.[8] The EIS examines alternative harvest strategies that comply with Federal regulations, the Fishery Management Plan (FMP) for Groundfish of the GOA, the Fishery Management Plan (FMP) for Groundfish of the BSAI Management Area, and the Magnuson-Stevens Fishery Conservation and Management Act. These strategies are applied using the best available scientific information to derive the total allowable catch (TAC) estimates for the groundfish fisheries. The EIS evaluates the effects of different alternatives on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. This document is available from:

https://alaskafisheries.noaa.gov/sites/default/files/gf-harvest-specs-finaleis07.pdf.

Annual Supplemental Information Reports for the EIS are available from:

https://alaskafisheries.noaa.gov//fisheries/groundfish-harvest-specs-eis.

Assessment of the Sablefish Stock in Alaska (Hanselman et al. 2017) in Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Resources of the Bering Sea/ Aleutian Islands Regions (NPFMC 2017c).

Annual SAFE reports review recent research and provide estimates of the biomass, stock status, and other biological parameters for each stock. The SAFE report includes the acceptable biological catch (ABC) recommendation that is considered by the Council for use by NMFS in the annual harvest specifications. The SAFE report also summarizes available information on the ecosystems and the economic condition of the groundfish fisheries off Alaska. This document is available from:

https://www.afsc.noaa.gov/REFM/Docs/2017/BSAIsablefish.pdf

Final Programmatic Supplemental Environmental Impact Statement (PSEIS) on the Alaska Groundfish Fisheries (NMFS 2004).

The PSEIS evaluates the Alaska groundfish fisheries management program as a whole and includes analysis of alternative management strategies for the GOA and Bering Sea/Aleutian Islands (BSAI) groundfish fisheries. The EIS is a comprehensive evaluation of the status of the environmental components and the effects of these components on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. This document is available from:

https://alaskafisheries.noaa.gov/fisheries/groundfish-seis.

[8] The alternatives considered in this EA will not cause any of the potentially significant impacts addressed in the Alaska Groundfish Harvest Specifications Final EIS to recur.

Report of Assessment and Research Activities (RARA; IPHC 2017).

The RARA includes information on fishery removals (including commercial, sport, bycatch, and personal use and subsistence), surveys, population assessments, and biological and ecosystem research for Pacific halibut. The RARA also includes the annual research plan for the following year. This document is available from: https://iphc.int/library/documents/report-of-research-assessment-and-research-activities-rara/report-of-assessment-and-research-activities-2017.

3.2 Analytical Method

This EA uses Table 2 to demonstrate the components of the human environment and whether the proposed action or its elements and options may be expected to have an impact on each component. The proposed action is to allow retention of legal-size halibut in pot gear used to fish sablefish IFQ and CDQ in the BSAI, provided the vessel operator also has sufficient halibut IFQ or CDQ. Extensive environmental analysis on all resource components is not needed in this document because the proposed action is not anticipated to have environmental impacts on all resource components. If there is a potential the proposed action may have an effect on the components of the human environment, that effect is examined more thoroughly in this section.

Table 2 Resource components potentially affected by the alternatives

Alternatives	Potentially affected component							
	Sablefish	Pacific Halibut	Pribilof Island Blue King Crab	Seabirds	Marine Mammals	Other bycatch species	Ecosystem	Socio-economic
Alt 1: No Action	N	N	N	N	N	N	N	N
Alt 2: halibut retention in sablefish pot gear	Y	Y	Y	Y	Y	Y	N	Y

N = no impact anticipated by each alternative on the component.
Y = an impact is possible if each alternative is implemented.

As demonstrated in Table 2, the proposed action has the potential to impact seven components of the human environment: sablefish, Pacific halibut, Pribilof Island blue king crab, marine mammals, seabirds, and other bycatch species. There are also expected to be socio-economic impacts.

While Alternative 2 does not provide any measure to define or enforce the "incidental" nature of halibut catch in sablefish pots, such as a maximum retainable amount (MRA; see Section 2.2 for a discussion on regulatory terminology), certain potential requirements that are included as optional "elements" will make it more difficult to target halibut (i.e., the requirement to have a tunnel opening no larger than 9 inches wide). If halibut harvested with pot gear remains incidental to the harvest of sablefish IFQ (e.g., the design of the pot does not change and the footprint of the fishery does not change), the expected effects of the alternatives would be particularly limited in scope and could include: (1) decreased wastage (i.e., required regulatory discards) of legal-size halibut; and (2) decreased mortality of halibut that are lost to whale depredation during fishing operations. If the retention of halibut in sablefish pot gear remains incidental to the historical patterns of the sablefish pot fishery, these impacts on the human environment would likely all be very limited.

If fishing behavior changes in order to harvest halibut with pot gear (e.g., pots are designed to target halibut, vessels move to habitat more suitable for halibut, and single pots are deployed), and efficiency in harvesting halibut IFQ increases, this action could also lead to (3) a potential decrease in whale and seabird interactions (i.e., entanglements) compared with the status quo gear of HAL (longline) gear in the BSAI, (4) a possible change in the footprint of the fishery; and (5) changes in bycatch, including possible interaction with blue king crab in the Pribilof Island Habitat Conservation Zone and other bycatch species. This more targeted-type of fishing for halibut is made available especially through the exemption of the 9-inch tunnel opening requirement (Alt 2, Element 3) and the ability to fish with single pots (Alt 2, Element 1). However, it may be possible for an individual to change their behavior to more efficiently harvest halibut with sablefish pot gear even without these elements.

Under either scenario, the primary difference would be the potential for halibut fishing patterns to change, as IFQ/ CDQ participants would have the opportunity to use pot gear to retain halibut IFQ and CDQ in the BSAI. However, no increase in halibut catches would be expected to occur, as this fishery is managed under a fully prosecuted quota system (see Figure 33 in Section Area 4 Harvest4.5.3.1); effectively capped through corresponding quota. Thus, *de minimis* effects are expected on other components of the ecosystem. No effect is presumed for these components because current or proposed fishing regulations, harvest limits, and habitat protections as described in previous NEPA documents (Section 3.1) would not be changed by any of the alternatives.

The socioeconomic environment may be affected by increased efficiency in harvesting halibut IFQ (e.g., catch per unit effort, reduced fuel/bait costs, reduced opportunity costs) if the opportunity is used, but could also be affected by the redistribution of effort among members of the existing harvest fleet (these issues are further discussed in the RIR, Section 4). The following subsections discuss the affected components in relation to each of the considered management alternatives.

3.3 Cumulative Effects Analysis

This EA analyzes the cumulative effects of each alternative and the effects of past, present, and reasonably foreseeable future actions (RFFA).

Actions are considered "reasonably foreseeable" if some concrete step has been taken toward implementation, such as a Council recommendation or NMFS's publication of a proposed rule. Actions only "under consideration" have not generally been included, because they may change substantially or may not be adopted, and so cannot be reasonably described, predicted, or foreseen. Identification of actions likely to impact a resource component within this action's area and time frame will allow the public and Council to make a reasoned choice among alternatives.

Actions are understood to be human actions (e.g., a designation of northern right whale critical habitat in the Pacific Ocean), as distinguished from natural events (e.g., an ecological regime shift). CEQ regulations require consideration of actions, whether taken by a government or by private persons, which are reasonably foreseeable. This requirement is interpreted to indicate actions that are more than merely possible or speculative. In addition to these actions, the cumulative effects analysis includes the effects of climate change.

Based on Table 2, the resources with potentially meaningful cumulative effects are sablefish and halibut. The one RFFA related to sablefish is GOA Amendment 101, which allowed sablefish IFQ to be harvested in pot gear in the GOA (see Section 3.4.6.3). The RFFA relevant to halibut cumulative effects is the proposal to link BSAI PSC limits to data on halibut abundance. See Section 3.5.6.3 for further details on this action and potential cumulative effects on the halibut resource. The cumulative effects on the other resources have been analyzed in numerous documents and the impacts of this proposed action and

alternatives on those resources is minimal, therefore there is no need to conduct an additional cumulative impacts analysis.

Each section below provides a review of relevant past, present, and RFFA that may result in cumulative effects on the resource components analyzed in this document. A complete review of the past, present, and RFFAs are described in the prior NEPA documents incorporated by reference and the supplemental information report (SIR) NMFS prepares to annually review of the latest information since the completion of the Alaska Groundfish Harvest Specifications EIS. SIRs have been developed since 2007 and are available on the NMFS Alaska Region website. Each SIR describes changes to the groundfish fisheries and harvest specifications process, new information about environmental components that may be impacted by the groundfish fisheries, and new circumstances, including present and reasonably foreseeable future actions.

3.4 Sablefish

3.4.1 Biology

Sablefish (*Anoplopoma fimbria*) inhabit the northeastern Pacific Ocean from northern Mexico to the Gulf of Alaska (GOA), westward to the Aleutian Islands (AI), and into the Bering Sea (BS) (Wolotira et al. 1993). Adult sablefish occur along the continental slope, shelf gullies, and in deep fjords, generally at depths greater than 200m. Alaskan sablefish spawn at pelagic depths near the edges of the continental slope (300-500m) between January and April. Sablefish observed from a manned submersible were found on or within 1m of the bottom (Krieger 1997). In contrast to the adult distribution, juvenile sablefish (less than 40cm) spend their first two to three years on the continental shelf of the GOA, and occasionally on the shelf of the southeast BS, and begin to move out to the continental slope around age four. The BS shelf is utilized significantly in some years and seldom used during other years (Shotwell et al. 2014).

Young-of-the-year sablefish feed primarily on euphausiids and copepods while adults are more opportunistic feeders, relying more heavily on pollock, Pacific herring, Pacific cod, squid and jellyfish. Coho and chinook salmon are the main predators of young-of-the-year sablefish. In gill nets set at night for several years on the AFSC longline survey, most young-of-the-year sablefish were caught in the central and eastern GOA (Sigler et al. 2001). Near the end of the first summer, pelagic juveniles less than 20cm move inshore and spend the winter and following summer in inshore waters where they exhibit rapid growth, reaching 30-40cm by the end of their second summer (Rutecki and Varosi 1997).

Sablefish are relatively long-lived. They begin to recruit to the fishery at age four or five and longevity often reaches 40 years (the oldest recorded sablefish in Alaska was 94 years old). Female size at 50% maturity is around 65cm (approximately age 6.5). Females are slightly larger than males, and natural mortality is estimated at $M = 0.10$.

3.4.2 Distribution

Sablefish have traditionally been thought to form two populations based on differences in growth rate, size at maturity, and tagging studies (McDevitt 1990, Saunders et al. 1996, Kimura et al. 1998). The northern population inhabits Alaska and northern British Columbia waters and the southern population inhabits southern British Columbia, Washington, Oregon, and California waters, with mixing of the two populations occurring off southwest Vancouver Island and northwest Washington. However, recent genetic work by Jasonowicz et al. (2017) found no population sub-structure throughout their range along the US West Coast to Alaska and suggested that observed differences in growth and maturation rates may be due to phenotypic plasticity or are environmentally driven. Significant stock structure among the

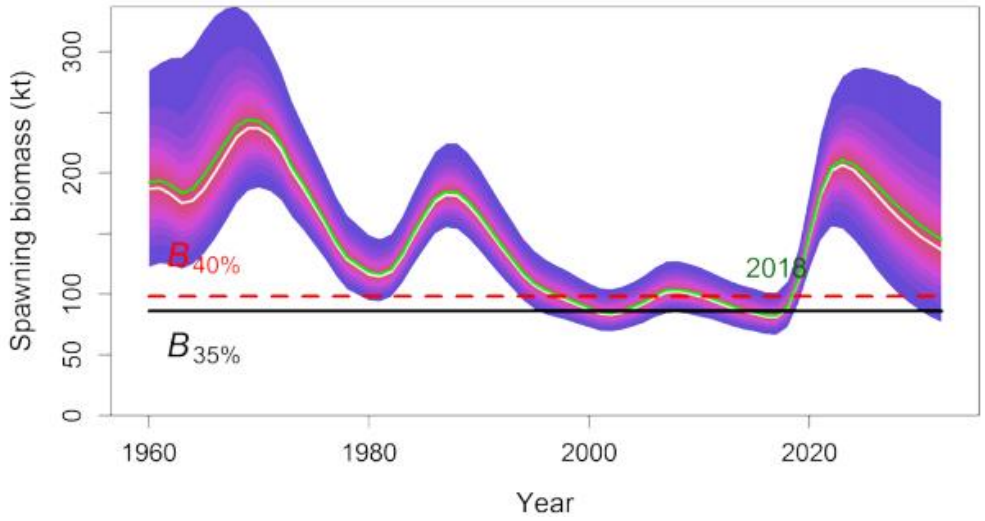
federal Alaska population is unlikely given extremely high movement rates throughout their lives (Hanselman et al. 2015, Heifetz and Fujioka 1991, Maloney and Heifetz 1997, Kimura et al. 1998).

A three-area spatial sablefish assessment model has been developed to examine regional sablefish biomass, and to use as an estimation model in ongoing apportionment research. There were spatial differences in total and spawning biomass for the three modeled regions; the Western region (comprised of the Bering Sea, Aleutian Islands, and Western GOA management areas) had the greatest total age 2+ biomass (45% in the 2015 terminal model year), the Central region (Central GOA management area) contained an estimated 30% of total biomass, and the Eastern region (West Yakutat and East Yakutat/SE regions) was 25% of total biomass. Model explorations examining alternative movement rates and model spatial parameterization suggested that the model was sensitive to both axes of uncertainty.

3.4.3 Status of the Stock

The sablefish stock is assessed annually in the SAFE report (NPFMC 2017c) and was also evaluated in the Alaska Groundfish Fisheries Harvest Specifications EIS (NMFS 2007a). The sablefish assessment is based on a statistical sex-specific age-structured model. This model incorporates fishery data and fishery independent data from domestic (AFSC longline survey, GOA trawl survey) and Japan-US cooperative longline surveys and. Sablefish fall under Tier 3b of the ABC/OFL control rule. The 2018 age 2+ biomass is estimated to be 330,655 tons for the BSAI. Female spawning biomass had increased from a low of 33% of unfished biomass in 2002 to 42% in 2008 and has declined slightly to about 36% of unfished biomass projected for 2018. Spawning biomass is projected to increase rapidly from 2018 to 2022, and then stabilize (Figure 2).

Figure 2 Estimates of female spawning biomass (thousands t) and their uncertainty

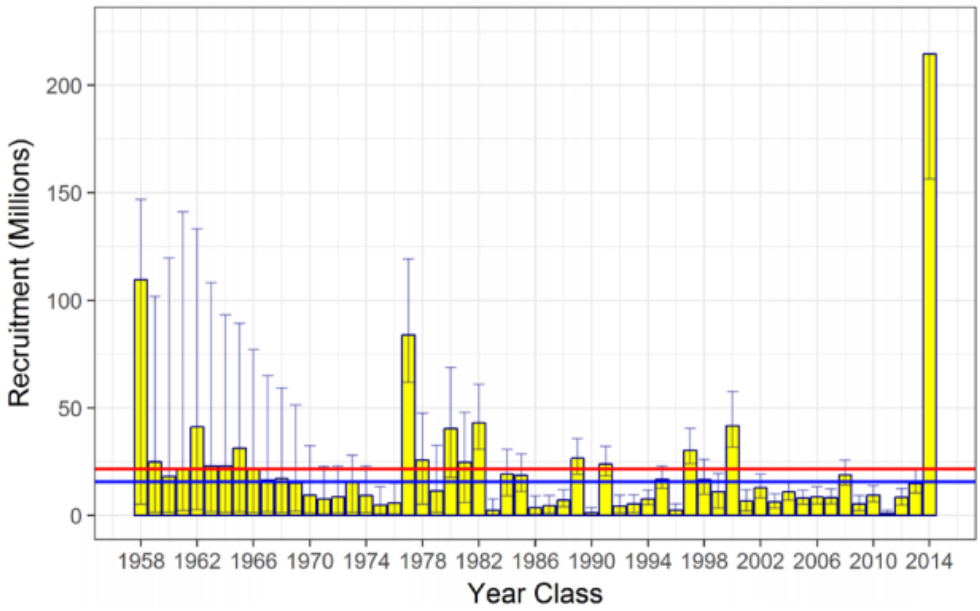


Source: (NPFMC 2017c)
Note: White line is the median and green line is the mean, shaded fills are 5% increments of the posterior probability distribution of spawning biomass based on MCMC simulations. Width of shaded area is the 95% credibility interval. Harvest policy is the same as the projections in Scenario 1 but with a yield multiplier of 0.867.

Since 1988, relative abundance has decreased substantially. Regionally, abundance decreased faster in the BS, AI, and western GOA and more slowly in the central and eastern GOA (Figure 3). Most surveys show that sablefish were at their lowest levels in the early 2000s, with current abundance reaching these lows again in 2014 in the central and eastern GOA, and in 2015 in the western areas. The last two surveys have shown some rebound, particularly in the combined Western areas.

The 2014-year class is estimated to be 2.5 times higher than any other year class observed in the current recruitment regime (Figure 3). Tier 3 stocks have no explicit method to incorporate the uncertainty of this new year class into harvest recommendations. While there are clearly positive signs of strong incoming recruitment, there are concerns regarding the lack of older fish and spawning biomass, the uncertainty surrounding the estimate of the strength of the 2014-year class, and the uncertainty about the environmental conditions that may affect the success of the 2014-year class (NPFMC 2017c).

Figure 3 Estimates of the number of age-2 sablefish (millions) with 95% credible intervals by year class



Source: (NPFMC 2017c)
Note: Red line is overall mean, blue line is recruitments from year classes between 1977 and 2013. Credible intervals are based on MCMC posterior. Upper confidence interval is omitted for the 2014-year class.

Depredation of sablefish off the AFSC longline survey by killer whales is accounted for in the sablefish stock assessment by dropping depredated skates from the calculation of survey abundance indices. Skates that are depredated by sperm whales are included in the assessment, as sperm whale impact on the skate is generally less severe. A new approach has been developed using a generalized linear mixed model to adjust survey catch rates for sperm whales, and this approach was used starting in 2016 (Hanselman et al. 2018). Depredation in the HAL fishery by both killer whales and sperm whales are estimated annually and added to the HAL catch in the assessment model, however, killer whale depredation is so severe it is harder to "correct" for (personal communication, D. Hanselman 2018). A projection based on the three-year average of this additional mortality is deducted from the maximum permissible ABC and OFL recommended for harvest limits (Hanselman et al. 2017).

The sablefish stock is neither overfished nor subject to overfishing; BSAI sablefish biomass levels are projected to decrease in the near future due to a lack of recruitment (Figure 3). It is estimated that the BSAI sablefish fishery under the status quo is sustainable.

3.4.4 Catch History

Sablefish has been harvested in the U.S. since the end of the 19th century as a byproduct of halibut fisheries. Harvests were relatively small, averaging 1,666mt from 1930 through 1957. Japanese longlining began in the Eastern Bering Sea around 1958 and expanded into the AI and GOA through the 1970s. Japanese fleet catches increased throughout the 1960s, and peak sablefish catch reached 36,776mt in

1972. Heavy fishing by foreign vessels during the 1970s led to a substantial population decline and fishery regulations in Alaska, which sharply reduced catches. Catch in the late 1970s was restricted to about one-fifth of the peak catch in 1972, due to the passage of the Fishery Conservation and Management Act (FCMA). By 1988, U.S. harvests made up the majority of sablefish harvested in the GOA and BSAI. Sablefish was increasingly harvested as a derby-style fishery in the late 1980s and early 1990s until the IFQ Program was implemented for the HAL fishery in 1995.

Annual catches for Alaska fisheries averaged about 1,700 t from 1930 to 1957 and exploitation rates remained low until Japanese vessels began fishing for sablefish in the BS in 1958 and the GOA in 1963. Catches rapidly increased during the mid-1960s. Annual catches for Alaska reached peaks in 1962, 1972, and 1988. The 1972 catch was the all-time high, at 53,080 t, and the 1962 and 1988 catches were 50% and 72% of the 1972 catch. Evidence of declining stock abundance and passage of the MSFCMA led to significant fishery restrictions from 1978 to 1985, and total catches were reduced substantially. Exceptional recruitment fueled increased abundance and increased catches during the late 1980s, which coincided with the domestic fishery expansion. Catches declined during the 1990s, increased in the early 2000s, and have since declined to near 11,000 t in 2015. TACs in the GOA are nearly fully utilized, while TACs in the BS and AI are rarely fully utilized (see Section 4.5.2.1 for more information on harvest and harvest rates).

3.4.5 Fishing Methods

In the BSAI, sablefish are harvested using a few different fixed gear types, including hook-and-line (HAL) gear, longline pots, single pots (pot and line), and trawl (Table 3). For the purposes of this action, only HAL and pot gear will be discussed here.

Table 3 Sablefish catch (t) in the Aleutian Islands and the Bering Sea by gear type from 1991-2017

Aleutian Islands				
Year	Pot	Trawl	Longline	Total
1991-1999	6	73	1,210	1,289
2000	103	33	913	1,049
2001	111	39	925	1,074
2002	105	39	975	1,119
2003	316	42	760	1,118
2004	384	32	539	955
2005	688	115	679	1,481
2006	461	60	629	1,151
2007	632	40	496	1,169
2008	177	76	646	899
2009	78	75	947	1,100
2010	59	74	914	1,047
2011	141	47	838	1,026
2012	77	148	979	1,205
2013	87	58	918	1,063
2014	160	26	635	821
2015	12	15	403	431
2016	21	30	298	349
2017	209	86	176	470
Bering Sea				
1991-1999	5	189	539	733
2000	40	284	418	742
2001	106	353	405	864
2002	382	295	467	1,144
2003	363	231	417	1,012
2004	435	293	313	1,041
2005	595	273	202	1,070
2006	621	84	373	1,078
2007	879	92	211	1,182
2008	754	183	204	1,141
2009	557	93	266	916
2010	450	30	273	753
2011	405	44	257	707
2012	432	93	218	743
2013	352	133	149	634
2014	164	34	115	314
2015	108	17	86	211
2016	158	257	116	532
2017	336	677	97	1,110

Source: (NPFMC 2017c). Both CDQ and non-CDQ catches are included. Catches in 1991-1999 are averages. Catch as of October 1, 2017.

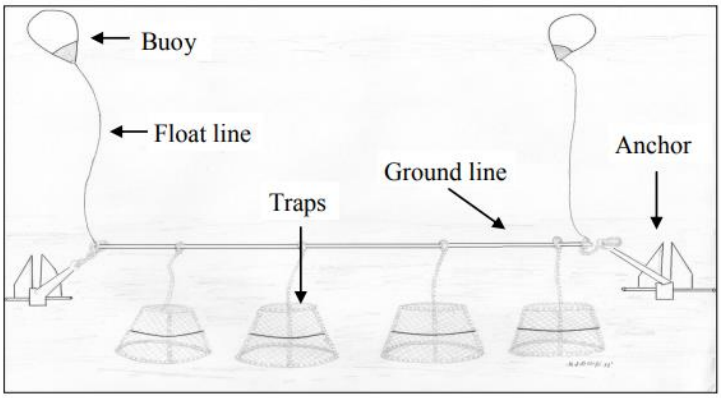
Hook-and-line gear in Alaska is fished on-bottom (also called bottom longlines). Since the inception of the IFQ system, average set length in the directed fishery for sablefish has been near 9 km and average hook spacing is approximately 1.2 m. The gear is baited by hand or by machine, with smaller boats generally baiting by hand and larger boats generally baiting by machine. Circle hooks are usually used, except for modified J-hooks on some boats with machine baiters. The gear usually is deployed from the vessel stern with the vessel traveling at five to seven knots. Some vessels attach weights to the longline, especially on rough or steep bottom, so that the longline stays in place on bottom (NPFMC 2017c).

As described in Section 2.2, there is no regulatory definition for "sablefish pot gear", though there are requirements that require a biodegradable panel and a maximum size requirements for tunnel openings (CFR §679.2), sometimes referred to in this document as an "excluder". Longline pot gear involves a stationary, buoyed, and anchored line with two or more pots attached (Figure 4), whereas single pots are limited to one pot on each line. With this gear type, pots, rather than hooks as with typical HAL gear, are set about 30 fathoms (180 feet) apart. In general, pots used for sablefish in Alaska are medium-sized pots which are smaller than crab pots, but bigger than those used to target shrimp. While there is no definition for the shape of a "sablefish pot", only for "longline pot gear" or "pot and line gear", they are generally conical, trapezoidal, or rectangular (Figure 5, Figure 6, Figure 7).

The conical pots have collapsible bottoms, which allow them to be stacked (Figure 5). Size of sablefish pots used seems to vary by the vessel. In discussions with those in the fishery, sablefish pots are between

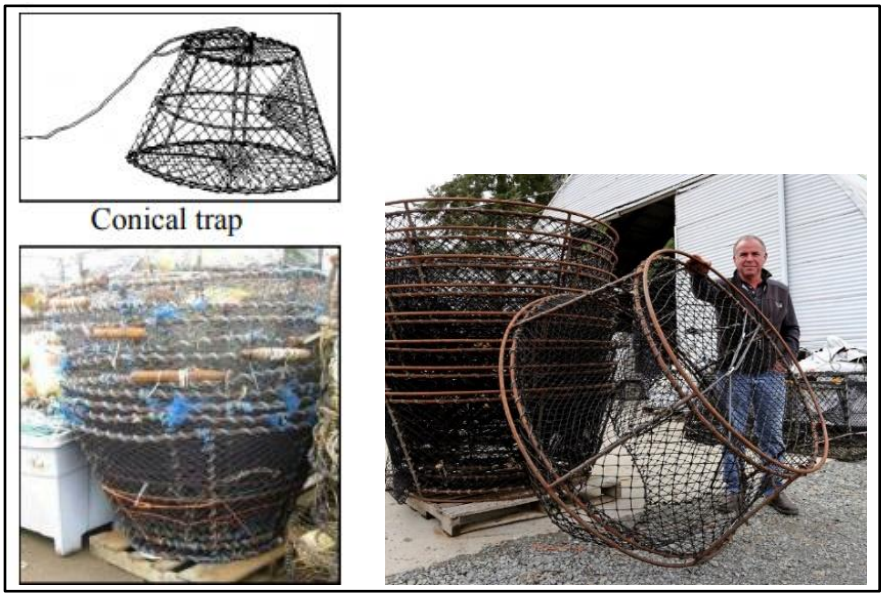
4x4 and 7x7 feet, and generally weigh between 100 and 200 pounds (personal communication, J. Kauffman 2018; personal communication, R. Hanson 2018).

Figure 4 Longline pots for sablefish



Source: http://www.westcoast.fisheries.noaa.gov

Figure 5 Conical traps for sablefish



Sources: http://www.westcoast.fisheries.noaa.gov
https://www.seattletimes.com/seattle-news/environment/feds-approve-cod-pots-to-outsmart-opportunistic-whales/

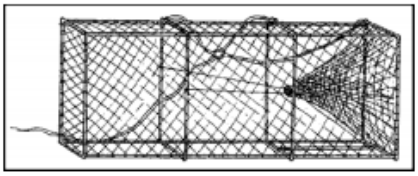
Figure 6 Trapezoidal sablefish traps

(A)

(B)

Source (A): http://www.westcoast.fisheries.noaa.gov
Source (B): https://kcaw-org.s3.amazonaws.com/wp-content/uploads/2015/02/FinFishPots_NeptuneMarineProducts.jpg?x41310

Figure 7 Rectangular sablefish trap



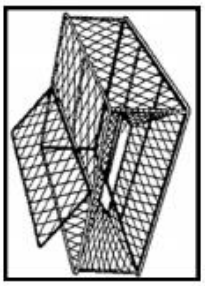
Source: http://www.westcoast.fisheries.noaa.gov

On the larger vessels, vessel operators may end up using their 6x6-, 7x7- or 8x8-foot cod pots. These pots are oftentimes modified crab pots, which are constructed with a steel bar frame (1¼ inch-diameter) and covered with tarred nylon mesh netting (3½ inch stretched mesh), and the openings refitted with plastic triggers or a small mesh "sock". Pot sizes range from 6 to 8 feet diameter square, with the average vessel using 6x6-foot pots. Each pot has two or three tunnel openings on opposite sides, with plastic finger funnels to retain the fish. The tunnel eye cannot be greater than 9 inches in any one dimension. An escape panel of untreated cotton must be sewn into the mesh (Mohn, et al. 2009).

Because crab pots are often retrofitted for use with Pacific cod, and sablefish pot gear may be retrofitted from there, a discussion of typical Alaska crab pots is warranted. Crab pots are generally large (700-800 lbs), and either conical or rectangular, but can also be circular or pyramid-shaped (Figure 8) and can be modified to have more restricted openings and additional layers of mesh or netting to target different sizes of crab.

Figure 8 Different styles of crab or Pacific cod pots/traps

Conical crab pot
Dimensions: 88" base diameter x 32" tall, 27.5" top opening



Crab or Pacific Cod

Rectangular crab traps
Made from galvanized steel and are covered with polypropylene mesh
Dimensions: 89" x 89"x 36"

Source: http://www.westcoast.fisheries.noaa.gov

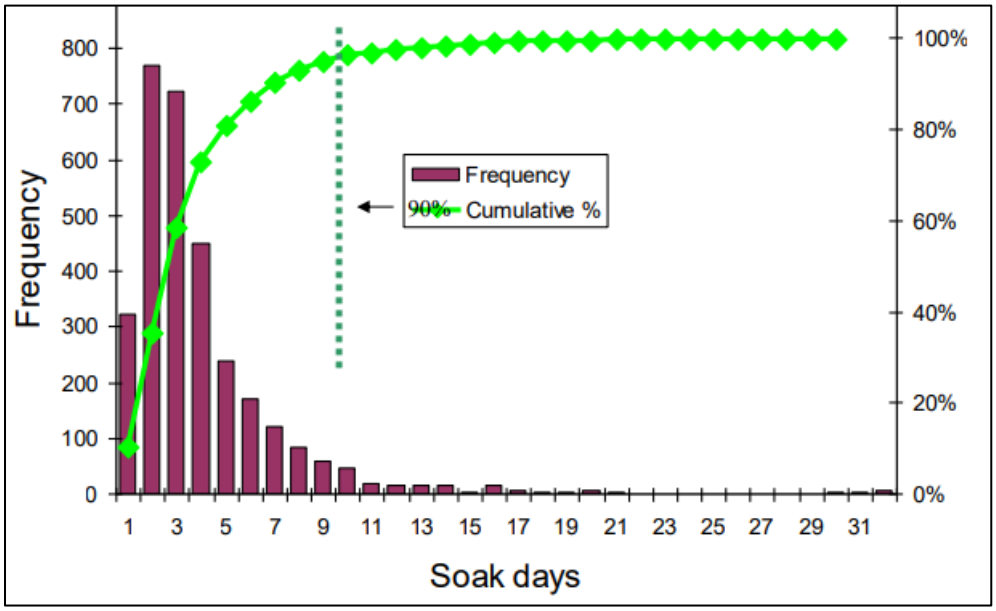
Though it is not required under current regulation, the Sablefish Gear Committee and the USCG reported that marking both ends of the pot longline string is the prevailing industry practice. Use of neutrally buoyant ("floating") groundline is also reported to be commonplace. Fishing gear is expensive to purchase and replace, so participants have a private incentive to incur small additional costs to reduce the likelihood of gear conflicts or lost gear. Vessel operators often operate in proximity to one another over many fishing days and seasons, so the avoidance of conflict between individuals has both a private and a social benefit.

Pot data are sparser than longline data, and in some years the data are considered confidential due to fewer than three vessels participating in the fishery. In addition, it is difficult to discern trends, since pot catch rates have wider confidence intervals than longline data due to smaller sample sizes. Observed sets are determined to be targeting sablefish if they comprise the greatest weight in the set.

In 2000, the BSAI pot fishery accounted for less than ten percent of the fixed gear sablefish catch in these areas, but effort has increased substantially in response to killer whale depredation. Pots are longlined with approximately 40-135 pots per set. Since 2004, pot gear has accounted for over 50% of the BS fixed gear IFQ catch and up to 34% of the fixed gear catch in the AI (Hanselman et al. 2017). However, catches in pots have declined significantly in recent years in the AI (only 12 t in 2015; Table 3). Pot catches increased substantially in both the AI and BS in 2017. Pot catches began occurring in the Gulf of Alaska in 2017 but make up a small proportion of the fixed gear catch (NPFMC 2017c).

In a study from 1999-2005, soak time—the amount of time that gear is left baited on the grounds before retrieval—for pot gear was typically on the order of one to three days. Ninety percent of pots were soaked for seven or fewer days (Figure 9). The number of pots set depends on the size of the vessel and the captain's efforts. One location may be tested by setting 5-10 pots and then more may be set if successful. Anecdotally, some vessels have multiple sets of pots which are set while the vessel gets another set of pots while the first set soaks. Other vessels will deploy pots and leave them to soak while heading back to port.

Figure 9 Number of soak days for 1999-2005 BSAI pot fisheries



Source: GOA Safe Report, 2008[9]

Amendment 14 to the GOA Fishery Management Plan banned the use of pots for fishing for sablefish in the GOA, effective November 18, 1985, starting in the Eastern area in 1986, in the Central area in 1987, and in the Western area in 1989. An earlier regulatory amendment was approved in 1985 for three months (27 March–25 June 1985) until Amendment 14 was effective. A later regulatory amendment in 1992 prohibited longline pot gear in the BS (57 FR 37906). The prohibition on sablefish longline pot gear use was removed for the BS, except from June 1 to 30 to prevent gear conflicts with trawlers during that month, effective September 12, 1996. Sablefish longline pot gear is allowed in the AI. In April 2015 the NPFMC passed a motion to again allow for sablefish pot fishing in the GOA in response to increased sperm whale depredation. The final motion was passed, and the final regulations were implemented in early 2017. Final regulations were implemented in early 2017, and the development of this gear type in the Gulf of Alaska will be carefully monitored by NMFS (NPFMC 2017c).

3.4.6 Effects of the Alternatives

The effects of using pot gear to harvest halibut IFQ and CDQ in the BSAI fishery are addressed here. This section considers whether the impacts on the sablefish stock are likely to be significant.

The effects of the BSAI sablefish IFQ and CDQ fishery on the sablefish stock is assessed annually in the BSAI SAFE report (NPFMC 2017c) and was also evaluated in the Alaska Groundfish Fisheries Harvest Specifications EIS (NMFS 2007a). The sablefish stock is neither overfished nor subject to overfishing. It is estimated that the BSAI sablefish fishery under the status quo is sustainable for sablefish stocks.

3.4.6.1 Alternative 1

Under the No Action alternative, federal regulation governing authorized fishing gear would continue to authorize all pot gear (i.e., longline and single pots) for sablefish harvest from any BSAI reporting area

[9] Available at http://www.afsc.noaa.gov/refm/docs/2008/sablefishgoa.pdf

(§679.2). A continued prohibition on halibut retention in BSAI pot gear would not decrease fishing mortality of sablefish. Under the status quo, sablefish fishing effort may continue to adjust avoid whale depredation on HAL gear. Sablefish IFQ/ CDQ participants in the BSAI currently have the option of using either HAL or pot gear to fish their quota.

Taking no action would not address the stated purpose and need for the action. The Council has identified the need to reduce the problems associated with whale depredation while minimizing gear conflicts and the amount of unaccounted mortality occurring due to whale depredation.

3.4.6.2 Alternative 2

Allowing retention of halibut in pots could motivate some fishery participants who possess both halibut and sablefish IFQ to switch from HAL to pot gear, and fish in specific areas. Thus, although BSAI sablefish IFQ and CDQ participants already have the ability to use pot gear to harvest their quota, there is a chance of increased participation in pot fishing.

In addition, as demonstrated in Figure 27 in Section 4.5.2.1, sablefish IFQ in the BSAI is not usually fully harvested. For example, in 2017, 54% of the BS sablefish IFQ was harvested, and 30% of the AI sablefish IFQ was harvested. Thus, if IFQ/ CDQ sablefish participants found a more cost-effective way to harvest more of their sablefish IFQ or CDQ, there may be a slight increase in the amount of sablefish harvested, relative to status quo. Changes in fishing behavior would also depend on whether halibut retention remains solely incidental to the sablefish fishery.

However, this increased harvest potential has existed under status quo as well, and any changes are not expected to be significant, particularly because of the need to hold IFQ and because of the imposed catch limits. No overfishing of sablefish would be allowed to occur. Overall, there are minimal expected effects of Alternative 2 on the sablefish resource. Sablefish IFQ/ CDQ can currently be fished with both single and longline pot gear in BSAI, so there is no expectation that this fishery will change in location, timing, or harvest methods outside of the status quo options.

The only other foreseeable effect on sablefish under Alternative 2 would be changes in sablefish bycatch (abundance or sizes) due to any change in the size of the tunnel opening on pot gear (Alternative 2, Element 3). If IFQ/ CDQ quota holders could target halibut with larger tunnel openings, this may have an impact on sablefish harvest. Assuming these quota holders would also hold IFQ or CDQ for any sablefish caught, current regulations would require the retention of this sablefish.

3.4.6.3 Cumulative Effects on Sablefish

One RFFA is identified as having a possible impact on the target species within the action area. In 2015, the Council passed Amendment 101 to allow sablefish IFQ to be harvested in pot gear in the GOA. The first-year vessels could adopt this new gear type for GOA sablefish was 2017. In 2017, 277 catcher vessels fished GOA IFQ sablefish, 245 using only HAL gear, 5 using only pot gear, and 17 using both as demonstrated in Section 4.5.2.3.

With Amendment 101 in place, under status quo, QS holders that configured their vessels to fish sablefish pot gear in the GOA could use the same vessel to harvest sablefish with pot gear in the BSAI, if they also had access to the appropriate sablefish IFQ. While pots have been a legal gear type for the BSAI sablefish QS holders previously, it is possible that the increased opportunity in the GOA will make it cost effective enough to reconfigure a vessel and purchase the gear necessary to prosecute both areas with pot gear. Under status quo, there could be an increase in vessels using pots to fish sablefish IFQ/ CDQ in BSAI due

to this action in the GOA. In 2017, there were 6 vessels using pot gear to harvest sablefish IFQ/ CDQ in the BSAI, compared to 4 in 2016. Two of the 6 vessels were also active in the GOA in 2017.[10]

The only potentially cumulative effect from this proposed action and Amendment 101 relates to the additional opportunity to retain halibut IFQ/ CDQ in pot gear. The marginal impacts of allowing for increased opportunity to retain halibut IFQ/ CDQ while pot fishing sablefish IFQ/ CDQ, together with additional opportunity in GOA, may increase the potential vessel revenue that could be generated from fishing with pot gear. This could justify the fixed costs associated with reconfiguring a vessel and purchasing the gear. Since the BSAI sablefish fishery has historically not been fully prosecuted (Figure 27), these combined changes may have an impact on the amount of sablefish harvested in the BSAI. Note that this option is currently available using HAL gear. Operators with available sablefish IFQ and halibut IFQ can catch and retain both species on the same trip.

These combined actions are not expected to jeopardize the stock biomass as the sablefish TAC caps QS holders to a specific number of fishable pounds. Moreover, these possible new entrants would be using an established gear type, and likely be within the traditional harvest season and footprint of the historical fishery. Thus, considering the direct and indirect impacts of the proposed action when added to the impacts of past and present actions previously analyzed in other documents that are incorporated by reference and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

3.5 Pacific Halibut

3.5.1 Biology

Pacific halibut (*Hippoglossus stenolepsis*) is one of the largest species of fish in the world, with individuals growing up to 8 feet in length and over 500 pounds (Keith et al. 2014). The range of Pacific halibut that the IPHC manages covers the continental shelf from northern California to the Aleutian Islands and throughout the Bering Sea (Figure 1). Pacific halibut are also found along the western north Pacific continental shelf of Russia and Japan (ibid.).

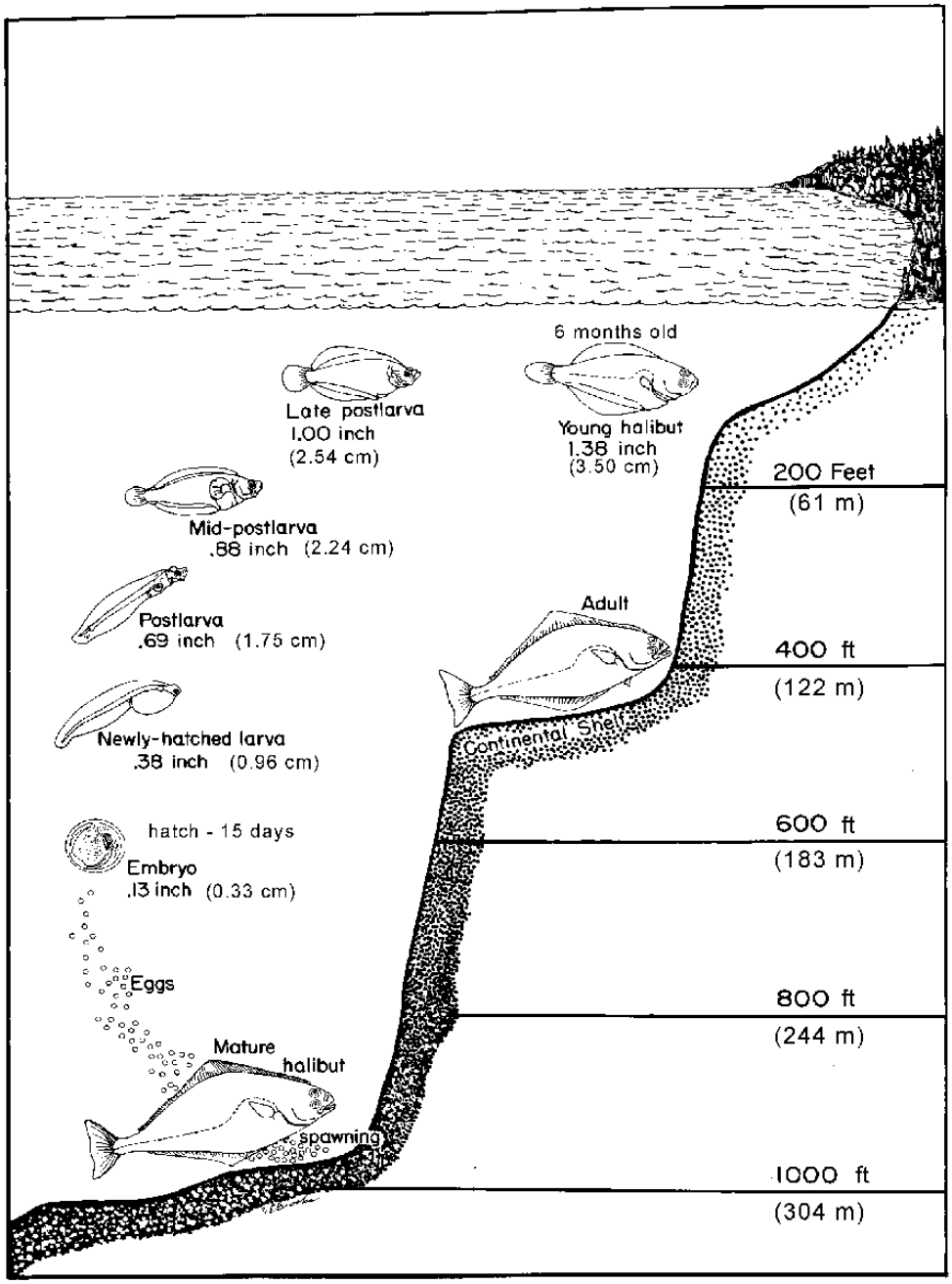
The depth range for halibut is up to 250 fathoms (457 m) for most of the year and up to 500 fathoms (914 m) during the winter spawning months. During the winter (November through March), the eggs are released, move up in the water column, and are caught by ocean currents. Female halibut release a few thousand eggs to several million eggs, depending on the size of the fish. Eggs are fertilized externally by the males. Prevailing currents carry the eggs north and west. By the age of 6 months, young halibut settle to the bottom in shallow nearshore areas such as bays and inlets. Tagging studies indicate that young halibut can make extensive movements, often counter to the currents that carried them away from the spawning grounds (Sadorus et al. 2015). Adults also make extensive movements within and among years, documented at over 1,000 miles for some fish (Webster et al. 2013). Most male halibut are sexually mature by about 8 years of age, while half of the females are mature by about age 11.6 (Clark and Hare 2006). At this age, females are generally large enough to meet the minimum size limit currently established for the commercial fishery of 32 inches; for males it takes several more years due to slower dimorphic growth. Halibut feed on plankton during their first year of life. Young halibut (1 to 3 years old) feed on euphausiids (small shrimp-like crustaceans) and small fish. As halibut grow, fish make up a larger

[10] Source: Catch Accounting sourced through AKFIN

part of their diet. Larger halibut eat other fish, such as herring, sand lance, capelin, smelt, pollock, sablefish, cod, and rockfish. They also consume octopus, crabs, and clams.

Halibut also move seasonally between shallow waters and deep waters. Mature fish move to deeper offshore areas in the fall to spawn and return to nearshore feeding areas in early summer. It is not yet clear if fish return to the same areas to spawn or feed, year after year (Keith et al. 2014). Figure 10 provides a representation of the halibut life cycle.

Figure 10 Life cycle of Pacific halibut



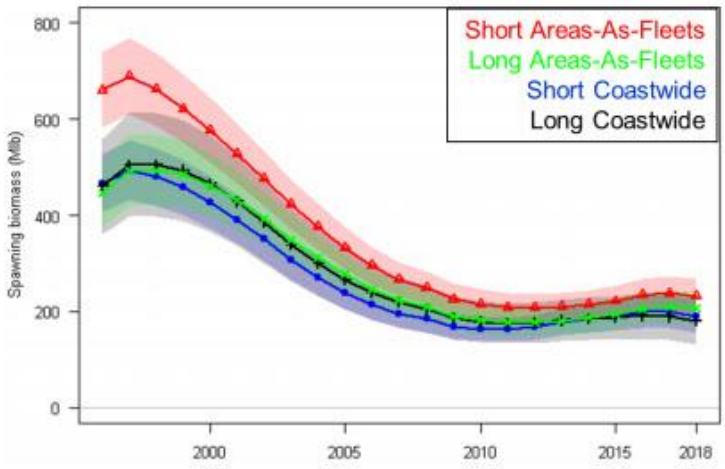
Source: (Keith et al. 2014)

3.5.2 Biomass and Abundance

The IPHC assesses the coastwide biomass of halibut, including fish that are accessible in the IPHC setline survey and to the directed halibut fisheries (generally fish over 26 inches; O26). The IPHC estimates the distribution of the coastwide stock based on survey catch rate among IPHC management areas using information from its annual setline survey. Because the IPHC setline survey does not extend throughout the Bering Sea, IPHC staff use the eastern Bering Sea trawl and other surveys to extrapolate the IPHC setline results across Area 4CDE.

The IPHC uses an ensemble approach to its coastwide stock assessment for the Pacific halibut stock, described in its assessment (IPHC 2018a). In this approach, multiple models are included in the estimation of management quantities, and uncertainty about these quantities. For 2017, these included two coastwide models and two areas-as-fleets models, in each case one using more comprehensive data available only since 1996, and the other using the full historical record (Figure 11). The results of the 2017 assessment indicate that the stock declined continuously from the late 1990s to around 2010 (IPHC 2018a).

Figure 11 Spawning biomass estimated from each of the four models included in the 2017 stock assessment ensemble.



Source: (IPHC 2018a)
Notes: Series indicate the maximum likelihood estimates, shaded intervals indicate approximate 95% confidence intervals

In general, recruitment has decreased substantially since the highs of the 1980s. A range of factors affect recruitment of new fish into the population. As noted in IPHC 2018a:

> Based on the two long time-series models, average Pacific halibut recruitment is estimated to be higher (41 and 76% for the coastwide and AAF models respectively) during favorable Pacific Decadal Oscillation (PDO) regimes, a widely used indicator of productivity in the north Pacific. Historically, these regimes included positive conditions prior to 1947, poor conditions from 1947-77, positive conditions from 1978-2006, and poor conditions from 2007-13. Annual averages from 2014 through October 2016 have been positive; however, many other environmental indicators, current and temperature patterns have been anomalous relative to historical periods. Further, observed declines in Pacific cod (*Gadus macrocephalus*) in the Gulf of Alaska, seabird mortality events and other conditions suggest that historical patterns of productivity related to the PDO may not be relevant to the most recent few years. Pacific halibut recruitment estimates IPHC-2018-AM094-08 [IPHC 2018b] Page 9 of 16 show the largest recent cohorts in 1999 and

2005. Cohorts from 2006 through 2013 are estimated to be smaller than those from 1999-2005. This indicates a high probability of decline in both the stock and fishery yield as recent recruitments become increasingly important to the age range over which much of the harvest and spawning takes place.

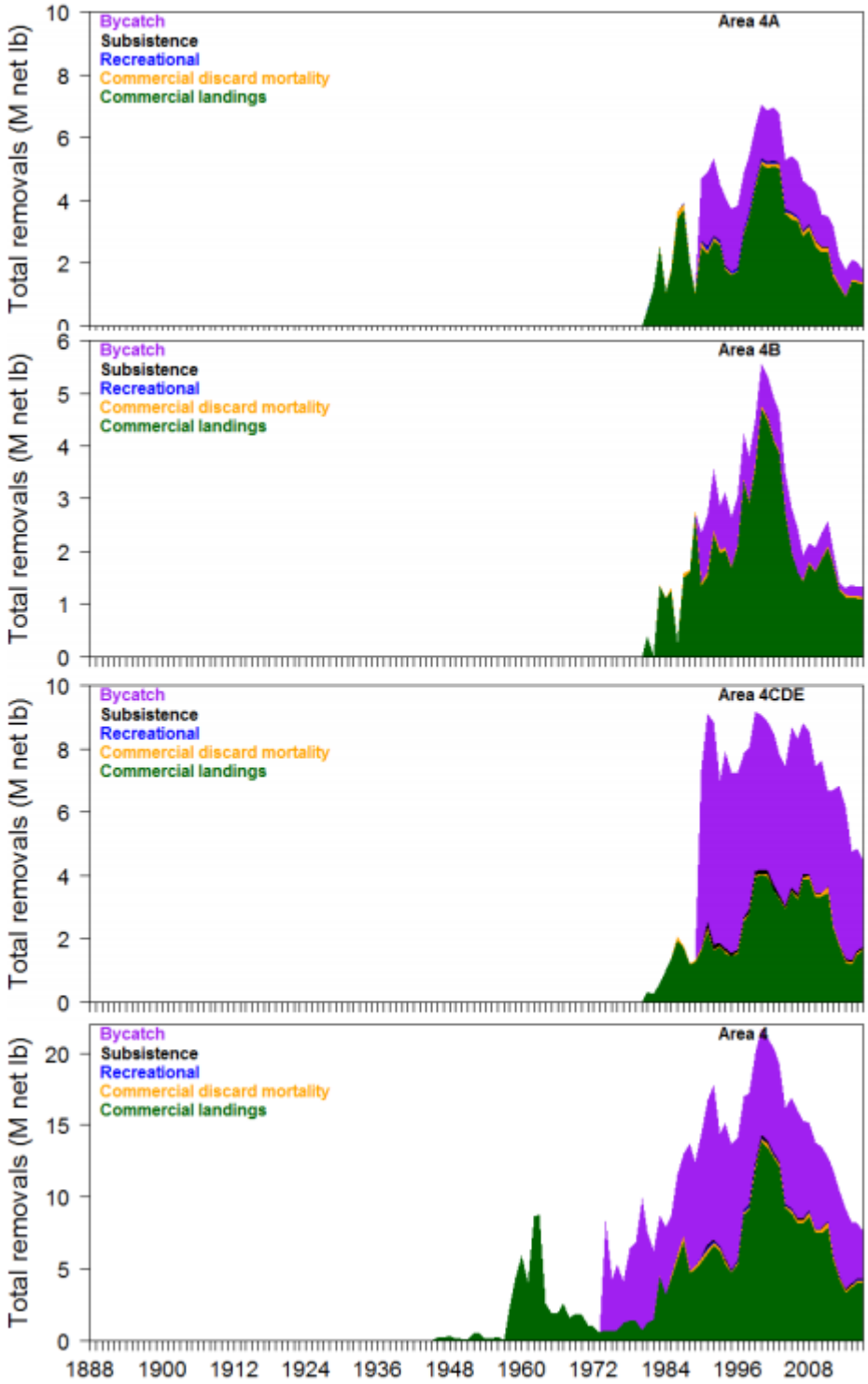
As described by the IPHC (2018b), although there has been a very strong trend of declining weight-at-age coastwide in recent decades, there are marked differences in the magnitude of this decline among regulatory areas. The coastwide trend is driven largely by trends in Area 3, where the bulk of the commercially available biomass occurs. Overall, while there have been weight-at-age declines in Area 4 (corresponding to the BSAI), they have not been as steep as in, for example Area 3A (IPHC 2018b). There do not appear to be consistent or strong trends from 2010 to 2017 in the area-specific data (IPHC 2018b).

The best available scientific information suggests that over the foreseeable future (2018–2021) the halibut resource is projected to decline. The 2018 stock assessment provides additional detail on the potential trends in the halibut stock, uncertainties in the assessment, and additional factors that may impact the overall stock status and harvestable surplus of abundance of halibut (IPHC 2018c).

3.5.3 Removals

Figure 12 shows that during the periods of high removal, the majority of the mortality on the halibut stock has been due to commercial catch. In 2017, the two top sources of removals in Area 4 are where commercial harvests (including discard mortality in the commercial fishery, i.e., "wastage") comprised 65% of the removals, and commercial groundfish fishery bycatch (referred to as prohibited species catch, or PSC, in fisheries off Alaska) accounted for 14% of removals.

Figure 12 Annual sources of mortality of halibut in regulatory Area 4A, 4B, and 4CDE and all of Area 4 combined since 1888



Source: (IPHC 2018a)
Note: the y-axes differ in scale

3.5.4 Status of the Stock

Since 2014, there is no information to suggest that halibut is subject to "overfishing," as that term is commonly applied to stocks managed under the Magnuson-Stevens Act. The Halibut Act does not define "overfishing" or require that an overfishing limit be defined. However, the halibut stock is currently managed in a manner that is not likely to result in a chronic long-term decline in the halibut resource coastwide due to fishing mortality from all sources of removals.

For more information on the status of the halibut stock, including fishing intensity relative to the spawning potential ratio, see IPHC (2018c) and Hicks and Stewart (2017).

3.5.5 Fishing Methods

The halibut fisheries are prosecuted with stationary groundlines (longlines), onto which baited hooks are attached. Gear in the halibut fishery can vary somewhat across vessels. In most cases, anchors are two-prong standard 50-lb anchors, and groundlines are generally constructed of 3/8-inch sinking line, with gangions of #72 to #86 twine, and 14/0–16/0 circle hooks. Some catcher vessels use snap-on gear with 3-ft to 4-ft long gangions spaced at 10-ft to 20-ft intervals. Some vessels use stuck gear (not snap on) with 12-inch to 16-inch gangions spaced at 10-ft to 20-ft intervals. Other vessels use combination gear (used to target both halibut and sablefish) with shorter gangions, shorter hook spacing (4 ft to 6 ft), and smaller hooks (13/0–15/0). Automatic baiting machines are used on many of the larger vessels. An average set consists of 10 to 20 skates of groundline, with each skate 100 to 150 fathoms long. The ends of each set are anchored and marked with buoys. The lower shot(s) (33 fathoms each) of the anchor line is (are) made of up to 3/4-inch floating poly, and the upper shot of line is made of up to 5/8-inch sinking line. A buoy marks the beginning of a set, and a flag (up to 10 ft high) typically marks the end of a set ("bag and flag" set-up).

To make a set, the first anchor is dropped and the vessel steams ahead with the groundline and baited hooks being set off the stern of the boat. The set is not necessarily made in a straight line; rather, the boat will steer to ensure that the groundline is set in the preferred areas based on depth contour and bottom structure. The second anchor is deployed, and the line is left to fish for 5 hours to 24 hours, depending upon the catch rates. Upon haulback, the groundline is fed through a hauler, and the fish are carefully taken off the hooks. The fish are bled and gutted, and put on ice, or in a hold of slush-ice on shorter trips.

Halibut fishing grounds occur in the AI shelf area as demonstrated in Figure 19. In the Eastern Bering Sea, halibut are taken in the upper slope area and the shelf area in the immediate vicinity of the Pribilof Islands and around St. Matthew's Island. Although there have been anecdotal reports of halibut as deep as 550 fathoms (personal communication, I. Stewart 2018), they are most often caught much shallower. Generally, halibut are caught between 25 m and 900 m (Webster et al. 2015).

3.5.6 Effects of the Alternatives

The effects of the use of current and proposed gear to harvest halibut IFQ and CDQ in the BSAI fishery are addressed here. This section considers whether the impacts on the halibut stock are likely to be significant.

3.5.6.1 Alternative 1

The effect of the commercial fishery on the halibut stock is assessed annually in the Report of Assessment and Research Activities (RARA); the latest edition is from December 2017 (IPHC 2017). As described in Section 3.4.5, the halibut stock is neither overfished nor subject to overfishing. Biomass levels are

projected to decrease in the near future due to a lack of recruitment, and size-at-age (ibid.). However, it is estimated that the halibut fishery under the status quo level of fishing intensity is sustainable.

Under the No Action alternative, Federal regulation governing authorized fishing gear for halibut IFQ (at §679.2) would continue to only include HAL fishing gear in BSAI (as further described in Section 2). A continued prohibition on halibut retention in BSAI pot gear would maintain similar levels of wastage of halibut, as legal and sublegal-size halibut would continue to be required to be discarded in the sablefish pot fishery. Mortality associated with these discards may occur both from the handling and discard process and also from whale depredation. Additionally, in the HAL halibut IFQ/CDQ fishery, hooked fish could continue to be preyed upon by whales.

While some studies have been done (see Section 3.8.2), halibut mortality from both types of whale depredation is difficult to observe and account for in total halibut removals. The incidental mortality of halibut due to whale depredation is not explicitly accounted for in stock assessment models because a time series of total annual whale depredation does not exist. The stock assessment model implicitly represents whale depredation losses as a reduction in the overall stock productivity (i.e., recruitment strengths and mortality rates). For example, increasing trends in whale depredation rates would be reflected as a decreasing trend in stock productivity.

Under Alternative 1 there may continue to be some changes in the spatial and/ or temporal distribution of fishing effort in the halibut IFQ/ CDQ HAL fishery in a continued effort to avoid whale depredation. For both the sablefish and halibut IFQ/ CDQ fisheries, fishing behavior has changed, and may continue to change to avoid whale depredation. Numerous techniques have been used including dropping gear to "wait the whales out", moving to different fishing grounds, setting decoy sets to distract the whales, or leaving and returning later. Fishing behavior could continue to adjust to whale depredation, and while this may lead to slight changes in the spatial / temporal distribution of the fishery, these changes are not likely to have any significant effect on the halibut resource. Under Alternative 1, no changes from the status quo would be expected to occur in terms of the size selectivity of the gear, the bycatch in the sablefish or halibut IFQ/ CDQ fisheries, prey availability for sablefish, or the overall stock biomass.

Taking no action would not address the stated purpose and need for the action. The Council has identified the need to reduce the problems associated with whale depredation while minimizing gear conflicts and the amount of unaccounted mortality occurring due to whale depredation.

3.5.6.2 Alternative 2

There are a few types of potential impacts to the halibut resource that are important to consider with regards to allowing halibut retention in sablefish pot gear in the BSAI.

Halibut Biomass

The IPHC does not recognize any conservation or sustainability concern in regard to this proposed action. Area 4 halibut fisheries have generally been fully prosecuted (as demonstrated in Figure 32 and Figure 33 in Section 4.5.3.1); therefore, it is not expected that this action would increase the overall harvest of halibut. In fact, there are two ways this action may lead to some level of reduction in overall halibut mortality. This includes: (1) a possible reduction in halibut mortality from whales preying on halibut in the HAL fishery corresponding with the proportion of halibut IFQ/ CDQ shifting to pot gear, and (2) a possible reduction in halibut wastage (i.e., fish that are discarded for regulatory reasons) from the sablefish pot fishery.

As described more in Section 3.8.2, it is understood that whale (in particular, resident killer whales in the BSAI) depredation of halibut occurs in the HAL halibut IFQ/CDQ fishery in Area 4. Halibut and

sablefish (as well as turbot) that are captured on hooks that lie on the bottom of the ocean floor are vulnerable to whale predation. Whales can completely remove or damage the halibut or sablefish before it is retrieved. Depredation is obvious when a crew retrieves a longline with hooks that contain only lips or torn, punctured fish remnants. Whales can also be observed pulling halibut from longline gear as it is nearing the surface. In addition, some of this depredation of HAL gear may go unobserved, and thus this source of removals is not directly included in the halibut stock assessment. Pot gear is an effective gear at minimizing depredation because whales cannot remove or damage sablefish or halibut enclosed in a pot when the gear is soaking. Thus, there may be some level of decreased halibut wastage as some harvest of halibut IFQ/ CDQ shifts to pot gear, concurrent with the sablefish IFQ/ CDQ fishery, and whales are not able to depredate on these halibut.

Another possible benefit to the halibut resource includes a decrease in mortality associated with whale depredation, due to a possible reduction in discarded legal-sized halibut in the sablefish pot fishery. Although bycatch rates are low, all halibut (both legal-sized and sub-legal) caught in sablefish pot gear must be discarded, regardless of availability of IFQ or CDQ. Prey is not as accessible to whales in pot gear as it is in HAL gear, nor should use of pot gear interfere with the harvest of targeted species, but participants have noted whales preying on halibut discarded from pot gear. Whale depredation can increase post-release/discard mortality rates beyond what it is due to damage to fish through pot soaking and the normal discard process. It is difficult for observers to account for whale depredation of discarded halibut, thus retention of halibut could reduce a source of unobserved halibut mortality. If a vessel had available halibut IFQ or CDQ and retained legal-size halibut caught incidentally in sablefish pots, this may reduce aggregate halibut mortality.

The quantity of halibut likely to be landed using pots is likely to be small relative to the overall removals from the stock in the short term and would not include a demographic component (size or age) not already experiencing mortality in either non-halibut target fisheries or recreational fisheries. Further, the IPHC's stock assessment allows for time-varying selectivity in the directed halibut fisheries, such that potential changes in size or age of halibut captured would be included in the estimates of fishing intensity (SPR), and therefore explicitly accounted for in the annual catch limit setting process (personal communication, I. Stewart 2018).

At the 2018 IPHC meeting, the Commission adopted the text proposed from the Secretariat[11] in response to a stakeholder proposal,[12] which proposed a modification to the IPHC Regulations to allow retention of Pacific halibut taken in long-line or single pot gear in the directed Pacific halibut fishery off Alaska, where such gear is permitted by domestic regulation. The IPHC Secretariat supported the regulatory proposal, stating that the primary concern was that any Pacific halibut caught in pots on the trip are tracked and reported.

Nevertheless, the primary reason the IPHC had previously been reluctant to allow a targeted effort of halibut fishing with pot gear areas is to preserve the current HAL characteristics of the IFQ halibut fleet. The IPHC had some concerns about gear conflict and potential disadvantage to vessels that were too small or otherwise unable to switch from longline to pot gear. Given the increasing testimony on the effects on socio-economic challenges related to halibut mortality due to whale depredation, the IPHC has revised its stance on the use of pot gear in the halibut fishery.

[11] IPHC-2018-AM094-23 at: https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-23.pdf

[12] IPHC-2018-AM094-PropC13: at https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-propc13.pdf

Size Selectivity

Other impacts that might occur include possible changes to the size of retained halibut IFQ/ CDQ due to the size selectivity of the gear type. Compared to HAL gear, it would be expected that pot gear would catch smaller fish on average.

The Council requested information on the size of halibut that are taken as bycatch in pot gear. AKFIN provided observer data on sampled halibut taken in both pot and HAL gear for all Alaska Federal groundfish management areas from 2008 through August 16, 2017. Table 4 shows the number of halibut taken as bycatch in the BSAI sablefish and Pacific cod fixed-gear fisheries that were sampled by fishery observers during the 2008 through 2016 period.[13] The BS and AI areas are combined in the table because only 3,300 of the roughly 120,000 samples were taken from the AI. The minimum legal size for commercially caught halibut is 32 inches, per IPHC regulations at Section 13(1)(a). Table 4 shows that, on the whole, a higher percentage of halibut taken in the Pacific cod fisheries were of sub-legal size compared to the sablefish fisheries. For sablefish, the percentage of sub-legal halibut was greater for pot gear than for HAL gear.

For comparison, observers sampled 9,000 halibut in GOA catcher vessel fixed-gear fisheries from 2008 through 2016, 94% of which occurred in the Central or Western GOA. The only pot gear groundfish fishery in the GOA during those years was for Pacific cod, and 83% of those halibut were of sub-legal size (4,100 out of 4,950). The GOA HAL fisheries for sablefish and Pacific cod yielded 4,050 halibut samples—1,522 in the sablefish HAL fishery and 2,538 in the Pacific cod HAL fishery. Sampled halibut bycatch in the GOA sablefish HAL fishery was 47% sub-legal, while sampled bycatch in the GOA Pacific cod HAL fishery was 72% sub-legal.

Table 4 Number of halibut (#fish) by size (cm) sampled by observers in BSAI sablefish and Pacific cod fixed-gear fisheries, 2008 - 2016

		CV		CP		Grand
Target	Length (cm)	POT	HAL	POT	HAL	Total
Sablefish	<81	638	8	25	15	686
	81-110	480	15	76	54	625
	111-140	25	2	5	19	51
	141-170		2		5	7
Sablefish Total		1,143	27	106	93	1,369
% Sub-legal		*56%*	*30%*	*24%*	*16%*	*50%*
PCod	<81	3,045	18	2,192	100,702	105,957
	81-110	143	1	210	11,561	11,915
	111-140	6		3	413	422
	141-170	1			56	57
	171-200				3	3
PCod Total		3,195	19	2,405	112,735	118,354
% Sub-legal		*95%*	*95%*	*91%*	*89%*	*90%*

Source: NMFS AFSC Observer Program, data compiled by AKFIN in Comprehensive_NORPAC.
Note: >81cm represents legal-size halibut (red line)

[13] Partial-year data from 2017 is omitted from the table as it only included 11 samples from the sablefish fishery and 18 samples from the CV sector overall (sablefish and Pacific cod).

Note that under the Council's current motion, a review of the effects of allowing retention of halibut in pot gear is called for after three years of implementation. Thus, an evaluation of the implications of changes in size selectivity on IPHC harvest policy and fishery yield could be evaluated at that point.

Fishing Footprint

Another potential change to the status quo of the HAL halibut IFQ/ CDQ fishery based on Alternative 2, is the possibility that fishing footprint for the harvest of halibut IFQ/ CDQ may change somewhat. Some halibut IFQ/ CDQ may be harvested from areas were sablefish pot fishing typically occurs if retained alongside sablefish IFQ/ CDQ fishing (see Figure 18 and Figure 19 in Section 3.6.3.2). Based on the maps, these areas do not differ drastically; fishing pressure for both species occurs in waters near Unalaska, throughout the Aleutians over to Atka, and up the shelf edge toward the Pribilof Islands. However, the locations can be different as these fisheries are typically prosecuted at different depths; halibut are typically shallower, but between 25 m and 900 m, whereas sablefish are typically harvested between 300 m and 800 m.

If targeted on the same trip as sablefish IFQ/ CDQ fishing, but at a depth more suitable for halibut, this could possibly also expand the footprint of IFQ/ CDQ fishing; vessels may try to access areas known for high presence of halibut, but that also have a high presence of fish-eating whales that precluded successful HAL fishing. IFQ participants have suggested that this would be an opportunity to access halibut along the shelf edge in 4D, which has been known to be difficult to prosecute due to a high presence of resident killer whales (personal communication, R. Hanson 2018). Participants have suggested that this might relieve some of the fishing pressure around St. Matthew Island (personal communication, R. Hanson 2018).

Level of Change

The magnitude of these impacts, depends, in part, on the level of halibut IFQ/ CDQ caught and retained in pots, and the extent to which fishing effort changes due to this new opportunity. As previously described, if retained halibut IFQ/ CDQ includes only the true intrinsically incidental rates caught in the sablefish fishery, effects to any environmental components may be minimal. Given the differences in typical fishing depths between the halibut and sablefish fishing, the presence of the 9-inch excluder (if this Element 3 is not adopted), and past data on halibut bycatch in sablefish pots, we would expect the catch of halibut in sablefish pots to be small, when the operator is specifically targeting sablefish IFQ or CDQ.

For instance, Table 5 demonstrates low halibut bycatch in the current sablefish pot fishery in the BSAI. This table shows the average amount of halibut bycatch in each of eight fishery/area/gear combinations between 2013 and 2016. The table includes a metric ton (mt) ratio of the average round weight halibut bycatch to average round weight of groundfish catch (mt/mt).[14]

Table 5 shows that halibut bycatch ratios do not differ substantially by area (BS vs. AI). The ratio is higher for the sablefish fishery relative to Pacific cod, and for HAL gear relative to pot gear. The figures in the table are an average across the 2013 to 2016 period, but annual bycatch ratios within each combination did show several outlier years (though the year itself was not consistent). In the BS sablefish

[14] Halibut bycatch is listed in (mt) of round weight recorded as opposed to estimated bycatch mortality. Estimated mortality is used for things like debiting bycatch against a PSC limit and is calculated by multiplying the round weight of bycatch by a discard mortality rate (DMR) that represents kilograms of halibut killed divided by tons of groundfish harvested. This analysis lists round weight of bycatch. Bycatch weight is a better analogue for the amount of halibut that could have been retained under the considered action.

pot fishery the proportion of halibut to groundfish weight was highest in 2013 at about 5%, and lowest in 2016 at 0.4%. The BSAI sablefish HAL fishery had an outlier year in 2015 in which the proportion of halibut to groundfish weight reached 36%, indicating a substantial amount of mixed fishing occurring.

Table 5 Average halibut bycatch (round mt, not mortality) and ratio of halibut to groundfish (round mt) in BSAI fixed gear fisheries, 2013 through 2016

		POT			HAL		
Target	Area	Halibut Bycatch Wt.	Groundfish Basis Wt.	Ratio	Halibut Bycatch Wt.	Groundfish Basis Wt.	Ratio
Sablefish	BS	5	172	0.028	4	52	0.086
	AI	2	65	0.028	27	401	0.068
BSAI Sablefish average		3	119	0.028	16	226	0.070
PCod	BS	35	39,564	0.001	4,032	159,902	0.025
	AI	1	3,567	0.000	59	2,099	0.028
BSAI Pcod average		23	27,565	0.001	2,046	81,000	0.025
Average for sablefish and Pcod		12	11,881	0.001	1,031	40,613	0.025

Source: NMFS Alaska Region Catch Accounting System, data compiled by AKFIN in Comprehensive_PSC

An overall greater amount of halibut may be landed with pot gear, compared to simply the intrinsically incidental amounts of legal-sized halibut in the sablefish pot fishery, if the retention of halibut in pot gear in the BSAI manifests as more of a mixed or targeted fishery, with both effort directed at catching sablefish as well as halibut in pot gear (e.g. the vessel moves to fishing grounds with a depth more suitable for halibut harvest and/ or deployed a different type of pot better designed for halibut).

This could lead to a greater degree of change experienced in the factors described above (i.e., reduction of whale depredation, possible changes in size selectivity, fishing footprint, and bycatch composition). However, even with the opportunity to have a more targeted effort, including the adoption of Alternative 2, Element 1, (the ability to use both single and longline pot gear) and Alternative 2, Element 3 (an exemption to the 9-inch max width tunnel opening requirement), it is unlikely there will be a large shift from HAL gear to pot gear for halibut IFQ and CDQ fishing. As discussed more in Section 4.7, there are large barriers to entry for use of this opportunity including access to halibut IFQ/ CDQ, presumably sablefish IFQ/ CDQ, and a vessel that can safely deploy pot gear in the BSAI.

Thus, this action is expected to provide some beneficial effects to the halibut resource, some uncertainties, but likely not a large degree of change overall. It may work towards the Council's Purpose and Need statement of reducing the problems associated with whale depredation while minimizing gear conflicts and reducing the amount of unaccounted mortality occurring due to whale depredation.

3.5.6.3 Cumulative Effects on Pacific Halibut

One RFFA is identified as having a possible impact on the target species within the action area. In addition to being harvested in the commercial, recreational, and subsistence fisheries, halibut are also incidentally taken as bycatch (Prohibited Species Catch; PSC) in groundfish fisheries. The Council is considering linking BSAI PSC limits to data on halibut abundance consistent with responsive management that varies with their abundance. The Council wishes to limit total halibut mortality to the extent practical while providing an opportunity for the directed halibut fishery and conserving spawning

stock biomass, particularly at low levels of abundance. The Council recognizes that abundance-based halibut PSC limits may increase and decrease with changes in halibut abundance.

Note that this issue is still within a development stage in the Council process; thus, not as far along as RFFAs typically discussed in an EA. However, the scope of this action and the level of effort involved in this possible change warrants inclusion in a discussion of cumulative impacts to halibut.

This possible future action could change the way the halibut resource is allocated to some users in the BSAI, which in turn could affect the total catch limits in the commercial halibut IFQ/ CDQ fishery (in an increasing or decreasing way). The Council's action could mean more or less halibut is available to commercial QS holders each year based on the new allocation methods. While it is not expected that a large portion of the Area 4 halibut IFQ/ CDQ will be shifted to be harvested in pot gear, given the barriers to entry described in Section 4.7; however, when combined with a possible halibut abundance-based PSC management action, there may be a cumulative shift in the gear responsible for total halibut removals.

Considering the direct and indirect impacts of the proposed action when added to the impacts of past and present actions previously analyzed in other documents that are incorporated by reference and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

3.6 Pribilof Island Blue King Crab and the Pribilof Island Habitat Conservation Zone

The Council will need to consider whether this proposed action might adversely impact blue king crab in the Pribilof Islands Habitat Conservation Zone (PIHCZ). The PIHCZ is established in regulation at Section 679.22(a)(6), and closes the area shown in Figure 14 to all directed fishing for groundfish using trawl gear, and directed fishing for Pacific cod using pot gear. Retention of halibut could increase pot gear use in the PIHCZ, which would adversely impact Pribilof Island blue king crab stock (PIBKC). Figure 13 shows the timeline of events relevant to this action and Section 3.6.2 briefly describes the management history.

Figure 13 Timeline of Council and NMFS Actions Relevant to PIBKC

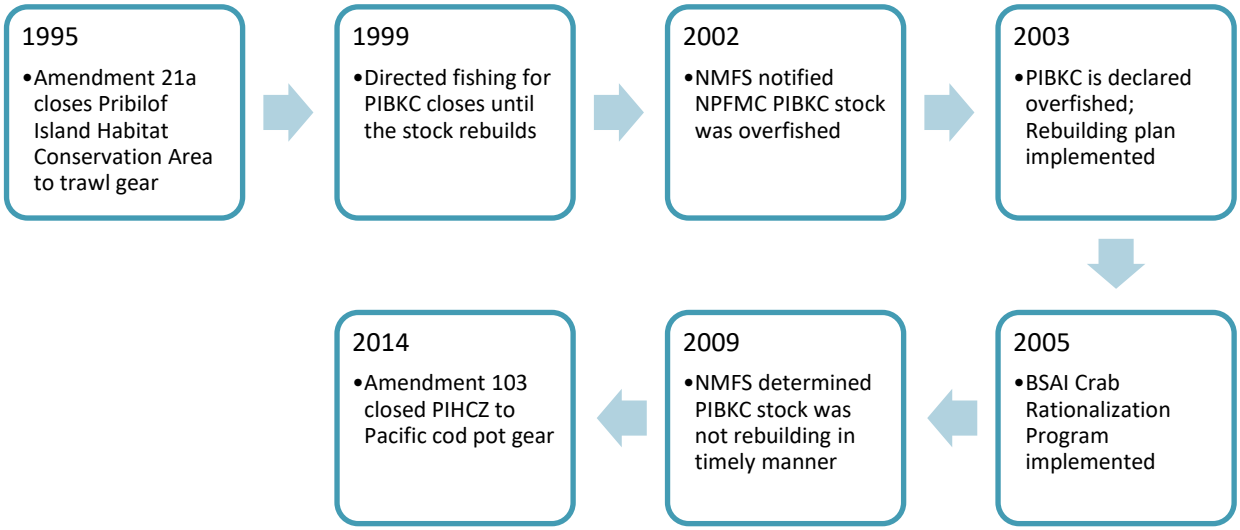
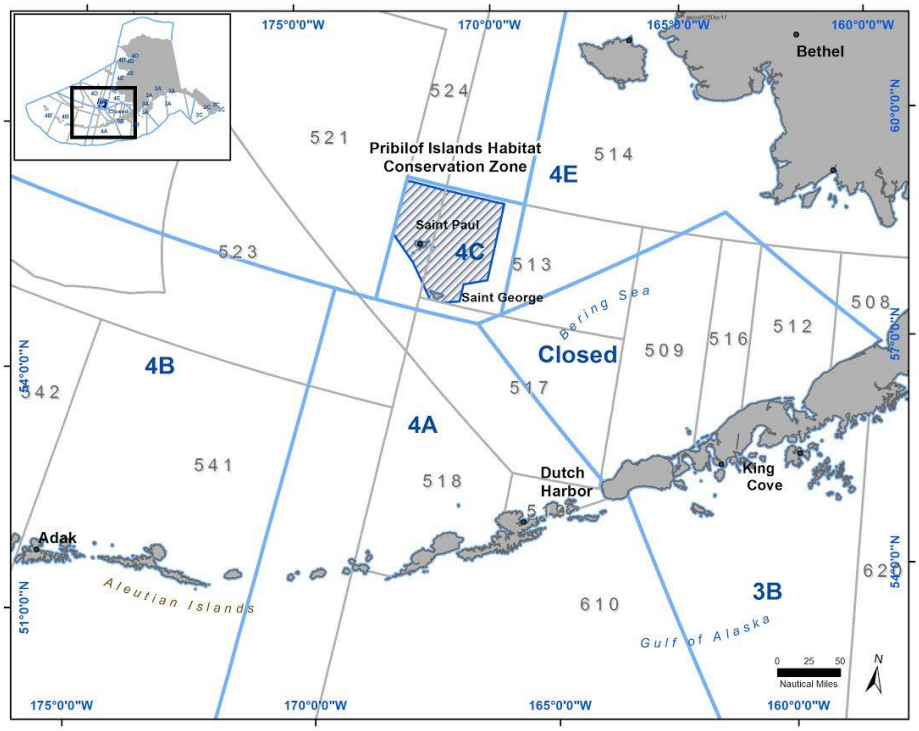


Figure 14 Pribilof Islands Habitat Conservation Zone with IPHC regulatory areas and NMFS management areas



Source: NMFS Sustainable Fisheries Division

PIBKC are overfished and experienced overfishing most recently in 2016. In 2016, bycatch of PIBKC in BSAI groundfish fisheries resulted in catch that exceeded the overfishing limit (OFL) for PIBKC (i.e., overfishing). NMFS subsequently informed the Council that it will use its in-season management authority to make precise closures to BSAI fisheries that use bottom contact gear if the blue king crab stock approaches its acceptable biological catch (ABC) limit and is approaching the OFL. Overfishing on the PIBKC stock did not occur in 2016/2017 crab year (July 1-June 30).

For more information and background on PIBKC rebuilding, please reference the following documents:

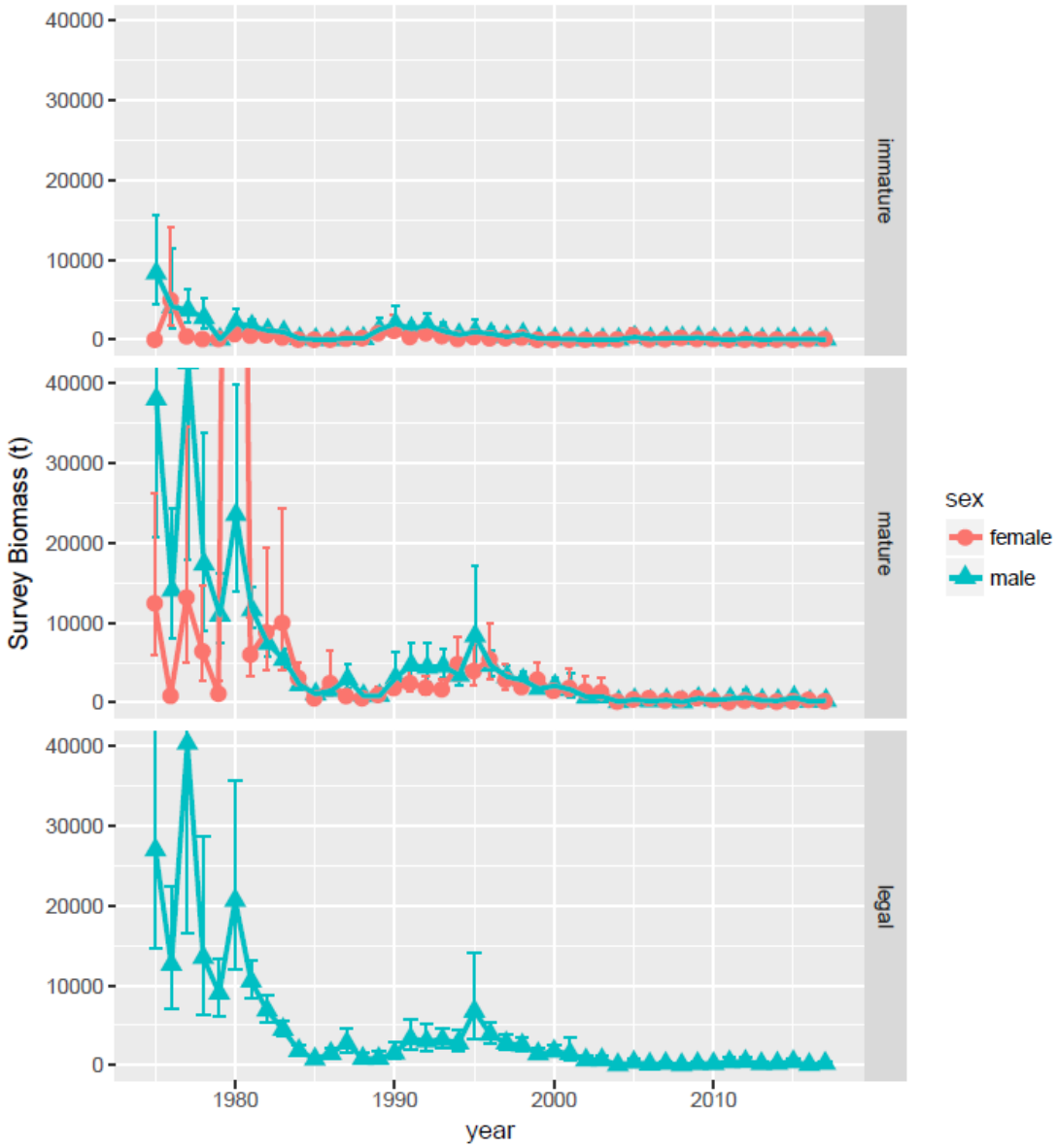
- Environmental Assessment of Amendment 17 to the FMP for BSAI King and Tanner Crab (2004) at this link: https://alaskafisheries.noaa.gov/sites/default/files/analyses/amendment17ea.pdf
- Regulatory Impact Review and Initial Regulatory Flexibility Analysis for Amendment 103 to the FMP for Groundfish of BSAI and the BSAI Crab FMP at this link: https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103draftririrfa.pdf
- Environmental Assessment for Pribilof Island Blue King Crab Rebuilding Plan which can be found at this link: https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103finalea.pdf
- 2017 SAFE Report for the PIBKC Fisheries of the BSAI found at this link: https://app.box.com/s/eq1gdh1rxlachjne45u4pirax7b4u2zu

3.6.1 Background on Crab Rebuilding and PIHCZ Designation

Declines in the PIBKC after 1995 resulted in a closure of directed from 1999 to the present. The stock was declared overfished in September 2002 and Alaska Department of Fish and Game developed a rebuilding harvest strategy as part of the NPFMC comprehensive rebuilding plan for the stock. In 2017, NMFS continues to identify PIBKC as an overfished stock that is not currently experiencing

overfishing.[15] Figure 15 represents the current biomass estimates for PIBKC, which has remain at low levels since it was declared overfished in 2002.

Figure 15 Pribilof Islands Blue King Crab Stock Biomass, 1977-2016



Source: https://app.box.com/s/eq1gdh1rxlachjne45u4pirax7b4u2zu

[15] Overfished: A stock that has a population size that is too low and that jeopardizes the stock's ability to produce its Maximum Sustainable Yield. Overfishing: A stock that has a harvest rate higher than the rate it produces its Maximum Sustainable Yield.

The economic value of the Pribilof district red king crab fishery peaked at $13.0 million in 1993 with an ex-vessel price of $4.98 per pound, the second highest price on record. The value of the Pribilof District blue king crab fishery peaked at $13.6 million in 1981/82, with an ex-vessel price of $1.50 per pound. Total value declined from $6.8 million in 1995 to $2.4 million in 1998.[16]

At present, the PIBKC stock is under a rebuilding plan with no directed fishery allowed. In addition, the Pribilof Islands red king crab fishery has been closed since the 1999 season due mainly to concerns about bycatch of blue king crab and the imprecision of abundance estimates for red king crab.

The PIBKC stock has not shown recovery since the rebuilding plan was enacted and remains overfished. As a result, there does not appear to be potential for a directed fishery for PIBKC to occur, nor does it appear likely that the Pribilof Islands red king crab fishery will be opened in the foreseeable future.[17] Currently the main sources of fishing-related mortality on the PIBKC stock are small amounts caught as PSC and bycatch in other directed crab fisheries (Table 6). With the exception of the pot cod fishery in the PIHCZ, which was closed in 2015, the groundfish fisheries are described in detail in the Programmatic Groundfish Supplemental Environmental Impact Statement (NMFS, 2004) and those descriptions are incorporated by reference. Amendment 21a to the BSAI Groundfish FMP prohibits the use of trawl gear in the Pribilof Islands Habitat Conservation Area (subsequently renamed the Pribilof Islands Habitat Conservation Zone in Amendment 43), which the amendment also established (NPFMC 1994). The amendment was implemented on January 20, 1995 and protects the majority of crab habitat in the Pribilof Islands area from the impact from trawl gear.

In selecting the boundaries for PIHCZ, the Council noted that the best scientific information from survey data on PIBKC based on location of crab, observed catch rates, and habitat type indicate that this area represents the highest concentration of PIBKC as well as PIBKC habitat.[18] Amendment 43 amended the prior rebuilding plan to incorporate new information on the likely rebuilding timeframe for the stock, taking into account environmental conditions and the status and population biology of the stock. For more information on this action, please review the associated Environmental Assessment (accessed at this link: https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103finalea.pdf). No pot fishing for Pacific cod has occurred within the PIHCZ since 2015/16.[19]

[16] https://www.npfmc.org/wp-content/PDFdocuments/resources/SAFE/CrabSAFE/2016CrabSAFE_final.pdf
[17] https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103finalea.pdf
[18] https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103finalea.pdf
[19] NPFMC BSAI Crab SAFE 2017.

Table 6 Total bycatch mortality from directed and non-directed fisheries for PIBKC (in mt) 1991-2017

Year	Crab Fisheries			Bycatch in Groundfish Fisheries		Total Bycatch Mortality
	females	legal males	sublegal males	fixed gear	trawl gear	
1991/92	--	--	--	0.013	4.959	4.973
1992/93	--	--	--	0.176	48.633	48.809
1993/94	--	--	--	0	27.386	27.386
1994/95	--	--	--	0.007	5.485	5.492
1995/96	--	--	--	0.022	1.027	1.049
1996/97	0	0	0.161	0.006	0.054	0.221
1997/98	0	0	0	0.292	0.104	0.396
1998/99	0.743	0.459	0.093	3.96	0.063	5.319
1999/00	0.394	0.699	0.858	0.159	0.016	2.125
2000/01	0	0	0	0.023	0.018	0.042
2001/02	0	0	0	0.167	0.023	0.19
2002/03	0	0	0	0.014	0.238	0.252
2003/04	0	0	0	0.069	0.182	0.251
2004/05	0	0	0	0.163	0.002	0.165
2005/06	0.01	0	0	0.071	1.071	1.152
2006/07	0.021	0	0	0.028	0.059	0.108
2007/08	0.027	0	0	0.799	0.106	0.931
2008/09	0	0	0	0.028	0.378	0.407
2009/10	0	0	0	0.043	0.165	0.209
2010/11	0	0	0.037	0.008	0.045	0.09
2011/12	0	0	0	0.022	0.006	0.028
2012/13	0	0	0	0.033	0.535	0.568
2013/14	0	0	0	0.013	0	0.013
2014/15	0	0	0	0.029	0	0.029
2015/16	0.021	0	0.046	0.149	0.646	0.861
2016/17	0	0	0	0.018	0.364	0.382

Source: NPFMC BSAI Crab SAFE 2017.

In 2002, NMFS notified the NPFMC that the PIBKC stock was overfished.[20] A rebuilding plan was implemented in 2003 that included the closure of the stock to directed fishing until the stock was rebuilt. In 2009, NMFS determined that the PIBKC stock was not rebuilding in a timely manner and would not meet the rebuilding horizon of 2014. Subsequently, Amendment 43 to the Crab FMP and Amendment 103 to the BSAI Groundfish FMP to rebuild the PIBKC stock were adopted by the Council in 2012 and approved by the Secretary of Commerce in early 2014.[21]

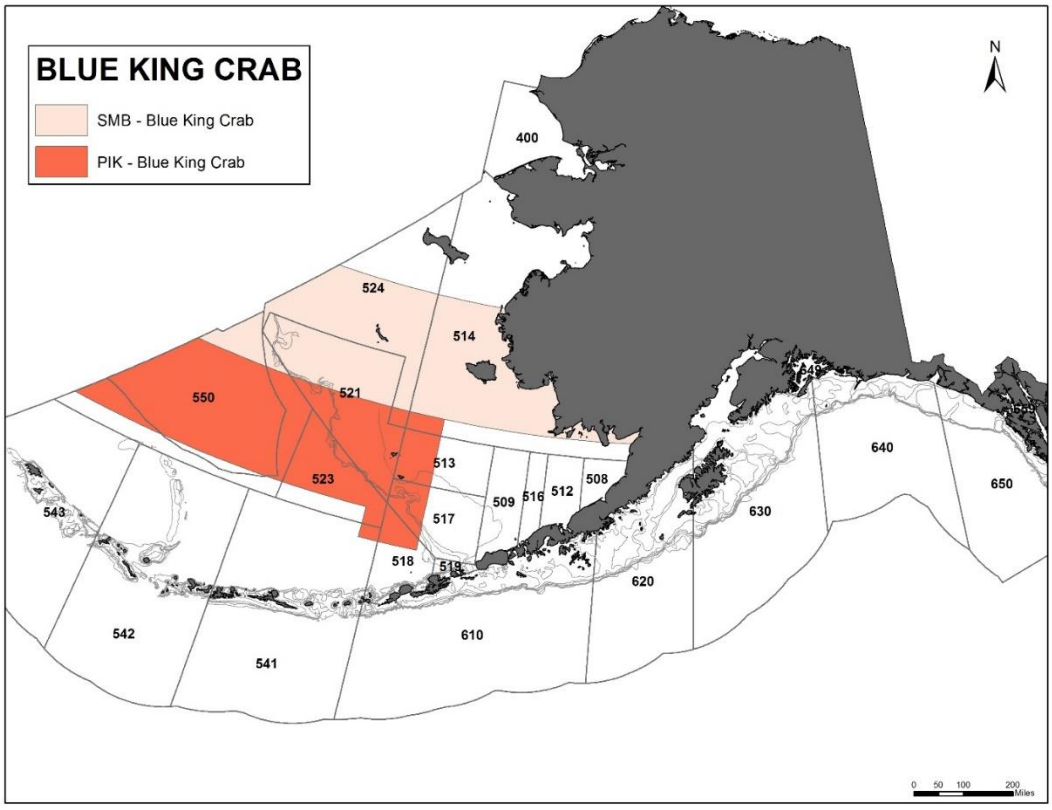
[20] https://www.federalregister.gov/documents/2002/10/04/02-25331/fisheries-of-the-exclusive-economic-zone-off-alaska-overfished-fisheries

[21] https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/PIBKCmotion612.pdf

Crab fishing in the BSAI was rationalized in 2005 during the same time the Council was taking action on rebuilding the PIBKC. The PIBKC was included in the rationalization program in the event that the stock would rebuild to allow for directed fishing.

The Council decided to close the PIHCZ year-round to directed fishing for Pacific cod with pot gear in October 2011. In 2014, Amendment 103 to the BSAI Groundfish FMP was published, prohibiting Pacific cod pot gear in the PIHCZ to promote bycatch reduction of PIBKC (see Figure 14).[22] The stock boundary for PIBKC begins east of the Pribilof Islands and extends parallel to the Aleutian Islands to the boundaries of EEZ jurisdiction (see Figure 16).

Figure 16 PIBKC stock boundary



Note: PIK refers to Pribilof Island Blue King Crab and SMB refers to St. Matthews Blue King Crab

The greatest concentration of PIBKC can be found within the PIHCZ, which encloses the Pribilof Islands and is closed to fishing with trawl gear and fishing for Pacific cod with pot gear (see Figure 14).[23] The boundaries of the area included known blue king crab habitat yet allowed for trawl access or pot gear fishing for Pacific cod near the Pribilof Islands. The boundary selected by the Council allowed trawl access to the edge of the 100 m contour and the groundfish resources to the east and north of the Pribilof Islands. The boundary was also drawn with straight edges and as few corners as possible in order

[22] https://www.federalregister.gov/documents/2014/12/02/2014-28113/fisheries-of-the-exclusive-economic-zone-off-alaska-pacific-cod-pot-gear-fishing-closure-in-the

[23] https://alaskafisheries.noaa.gov/sites/default/files/analyses/43_103draftririrfa.pdf

to facilitate ease of closure enforcement. The boundary selected does not encompass the entire range of blue king crab in the area but does surround the habitat with highest blue king crab concentrations.[24]

3.6.2 Management of Incidental PIBKC Catch in the BSAI Groundfish Fisheries

In-season staff and the industry fishing in or near the PIBKC stock boundary areas closely monitor catch of PIBKC. Vessels have a high incentive to avoid PIBKC. If the OFL is approached for PIBKC, NMFS may close specific areas to directed fishing in order to prevent the OFL from being reached. These actions can close directed fisheries in those areas for the duration of the crab year. These actions are limited to groundfish directed fisheries. In-season management does not currently have the authority to close halibut fisheries in the event that the OFL is approached. The Council desired to prevent overfishing on an annual basis and ensure that all fisheries contributing to PIBKC bycatch mortality share in the rebuilding effort.

The most recent closure occurred in 2015/2016 near the northeastern corner inside the stock boundary and outside of the PIHCZ. When incidental catch in the groundfish fisheries of 1.552 mt surpassed its OFL, NMFS closed all fishing activity in this area. The total number of crabs caught as bycatch in 2015/16 was 609, with 52% of the bycatch harvested by non-pelagic trawl and 48% harvested by hook and line. Directed crab fishing is jointly managed with ADFG who manages the crab fishery openers and closures. Based on the continued low abundance and the known distribution of PIBKC, ADFG closes areas near the Pribilof Islands to crab fishing to limit bycatch.[25]

The estimate of blue king crab Prohibited Species Catch (PSC) by gear type in the BSAI are based on catch reports and observer data. In the last five years (2013-2017), estimates of blue king crab PSC numbers by gear type show the pot gear sector incidentally harvested 89% of all blue king crab PSC in the BSAI.[26] The number of blue king crab harvested in the entire BSAI includes crab that are incidentally harvested in the PIHCZ and the PIBKC stock boundary, which are sensitive areas subject to closures because of the status of the PIBKC.

Observer coverage in this area is limited to vessels over 40 feet. Most catcher/processors in the BSAI have at least 100% observer coverage. For the last few years, the OFL has been 1.16 mt or 2,600 lbs. The AKRO Catch Accounting System uses available observer data to estimate crab on unobserved trips, including trips taken on vessels less than 40' LOA. Since these vessels are unobserved, an underlying assumption in the CAS methodology is that these vessels have similar catch characteristics as observed vessels. This assumption has not been verified. Crabs can be patchy in distribution, resulting in fishing evens with no crab catch being next to events with relatively high crab catch. This dispersion can lead to high variability in crab estimates, which complicates management. This is of particular concern when available observer coverage is low and estimates are only able to be made from at-sea observer information that is skewed towards the tails of the 'true' catch population (resulting in a very low estimate or a very high estimate relative to the 'true' mean). This leads to a high degree of uncertainty in the estimates, and in situations where the crab estimate is high, can lead to fishery closures.

Figure 17 shows the observed hauls with incidental blue king crab catch from 2015-2017. A small amount of crab can trigger closures near and within the PIBKC stock boundary area. The estimated crab numbers per haul are concentrated on the eastern edge of the PIBKC stock boundary.

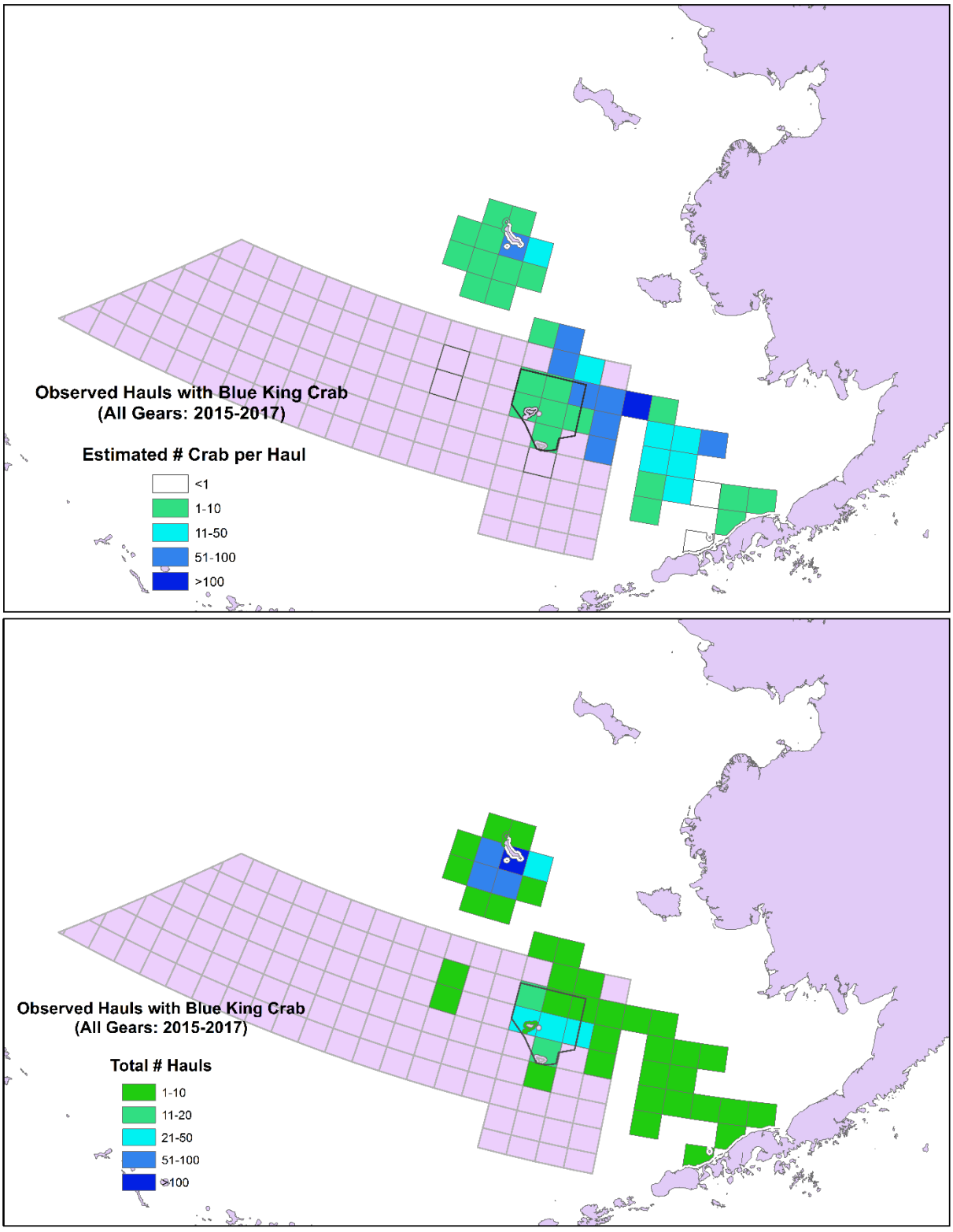
[24] NPFMC BSAI Crab SAFE 2017.

[25] http://www.adfg.alaska.gov/FedAidPDFs/FMR17-10.pdf

[26] NMFS Catch Accounting.

The PIHCZ bisects ADFG statistical areas. As a result, estimating harvest on those boundaries area is unreliable for unobserved vessels since landings are reported at the ADFG statistical area, and not based on the conservation zone. At this time, NMFS does not know the number of blue king crab incidentally caught by unobserved specific vessels. There is no data on catch composition (e.g., the number of crab caught incidentally) for IFQ fishermen within the stock boundary area or the PIHCZ for sablefish pots and hook-and-line and halibut hook-and-line.

Figure 17 Observed Hauls with Blue King Crab Incidental Catch, 2015-2017



Note: Purple shaded area illustrates the PIBKC stock boundary

3.6.3 Effects of the Alternatives

Pot gear is particularly effective at catching crab. Sablefish pots in the BSAI have caught PSC of golden king crab, as well as some *C. bairdi*, red and blue king crab (Table 10). The proposed action could impact PIBKC if fishing with pot gear increased in the PIBKC stock boundary area.

Amendment 103 closed the PIHCZ (see Figure 14) to pot fishing for Pacific cod to promote bycatch reduction on PIBKC. Pot fishing for other species (sablefish, halibut) was not prohibited in 2014 with Amendment 103. The habitat in PIHCZ is not suitable for sablefish and pot gear has not traditionally been used to fish for halibut. Targeting sablefish with pot gear in the PIHCZ is not common because the shallower depth of the substrate within the PIHCZ is not preferred habitat for sablefish. However, the shelf is prime Pacific cod and halibut habitat. Halibut exist in the PIHCZ and the area is known to be common fishing grounds for hook-and-line vessels of all sizes and capacities, which have never been prohibited from fishing in the PIHCZ.

Allowing retention of halibut, even if there is sufficient halibut IFQ onboard the vessel, while targeting sablefish with pot gear in this area *could* lead to more fishing activity within the PIBKC stock boundary area. It is unclear if allowing halibut retention would lead to increased pot gear activity within the stock boundary, which is the primary way to catch crab.

Years of crab stock rebuilding plans have been in place to protect this species. Introducing pot gear into this area would create more fishing pressure on a stock that is in its second rebuilding plan because the first plan did not meet its goals.[27] In addition, more vessels could be using gear in the PIHCZ that catches PIBKC and it would increase the risk that the OFL could be reached due to additional bycatch. That could trigger area or fishery closures.

3.6.3.1 Alternative 1

The current prohibition of the retention of halibut in pot gear is the status quo, or No Action, alternative. Alternative 1 would not introduce new gear or participants into the sablefish pot fishery and would not have a significant impact on PIBKC.

3.6.3.2 Alternative 2

NMFS suggests that the Council determine whether the PIHCZ regulation should be amended to prohibit all pot gear in this area. Alternative 2 allows halibut retention in pot gear if the QS holder onboard has sufficient IFQ pounds onboard. NMFS anticipates that this would lead to an increased opportunity to retain halibut and expects an increase in the use of pot gear over status quo. If this is the Alternative the Council prefers, NMFS recommends including an element to close the PIHCZ to all pot gear. The Council should limit increased pot gear within the stock boundary area to avoid fishery and area closures that could be triggered by approaching an OFL for the PIBKC.

To prohibit all pot fishing in the PIHCZ, NMFS would have to change regulations at §679.22(a). The impact of increased fishing pressure on PIBKC within the PIHCZ and/or the stock boundary presents a greater risk that groundfish fisheries will be closed when the PIBKC OFL is reached. Note that NMFS does not have the mechanism to close the halibut fishery due to overfishing of blue king crab, as explained in Section 3.6.2. If IFQ holders caught more blue king crab in pot gear, NMFS would have to determine if closing the appropriate groundfish fisheries are necessary to meet its obligation to prevent overfishing of PIBKC. NMFS Office of Law Enforcement cannot distinguish between targeting of halibut

[27] https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Crab/PIBKCrebuildingEA512.pdf

or sablefish as long as the vessel has IFQ onboard, so simply limiting halibut pot gear would not solve the problem.

Table 7 shows the number of vessels that employed longline gear, pot gear, and both longline and pot gear from 2008-2017. The number of vessels that switch between longline and pot gear remains small. Based on participants who can participate in both fisheries in Table 7, NMFS can expect that the additional opportunity to retain halibut would attract new entrants or increase fishing activity in the stock boundary area.

Table 7 Count of Vessels that Employ Longline, Pot and Both Longline and Pot Gear in BSAI, 2008-2017

	Longline Vessels	Pot Vessels	Vessels that use both Longline and Pot Gear
2008	169	81	17
2009	166	57	12
2010	166	57	9
2011	164	61	13
2012	148	59	15
2013	297	63	13
2014	212	61	12
2015	187	51	12
2016	185	60	14
2017	182	71	13

Source: NMFS Catch Accounting System

There is a universe of 25 vessels that have fished both pots and longline gear in the BSAI in the last five years (2013-2017).[28] Eighteen of these vessels are 58 ft LOA and under and seven are 59 ft or longer. Longline vessels that can switch to using pot gear would be most likely to switch over because they would benefit from retention of halibut and have a network of IFQ that they could utilize when pot fishing.

Figure 18 shows the retained sablefish weight by vessels employing pot gear from 2013-2017. The range of their activity is near Adak and due north of Dutch Harbor. No sablefish pot gear activity occurred within the PIHCZ. Figure 19 shows retained sablefish and halibut weights by longline vessels from 2013-2017. The greatest concentration of fishing activity occurs northwest from Dutch Harbor, following the contours of a continental shelf. Some longline vessel activity occurs within the PIHCZ for halibut, whereas sablefish fishing occurs outside the PIHCZ. If halibut retention is allowed under this alternative, it is expected that potential future fishing activity could mirror current halibut hook-and-line fishing activity and pot fishing could increase in the PIHCZ or the PIBKC stock boundary area because sablefish and halibut directed fishing with pot gear is not prohibited, unlike trawl gear or Pacific cod pot gear.

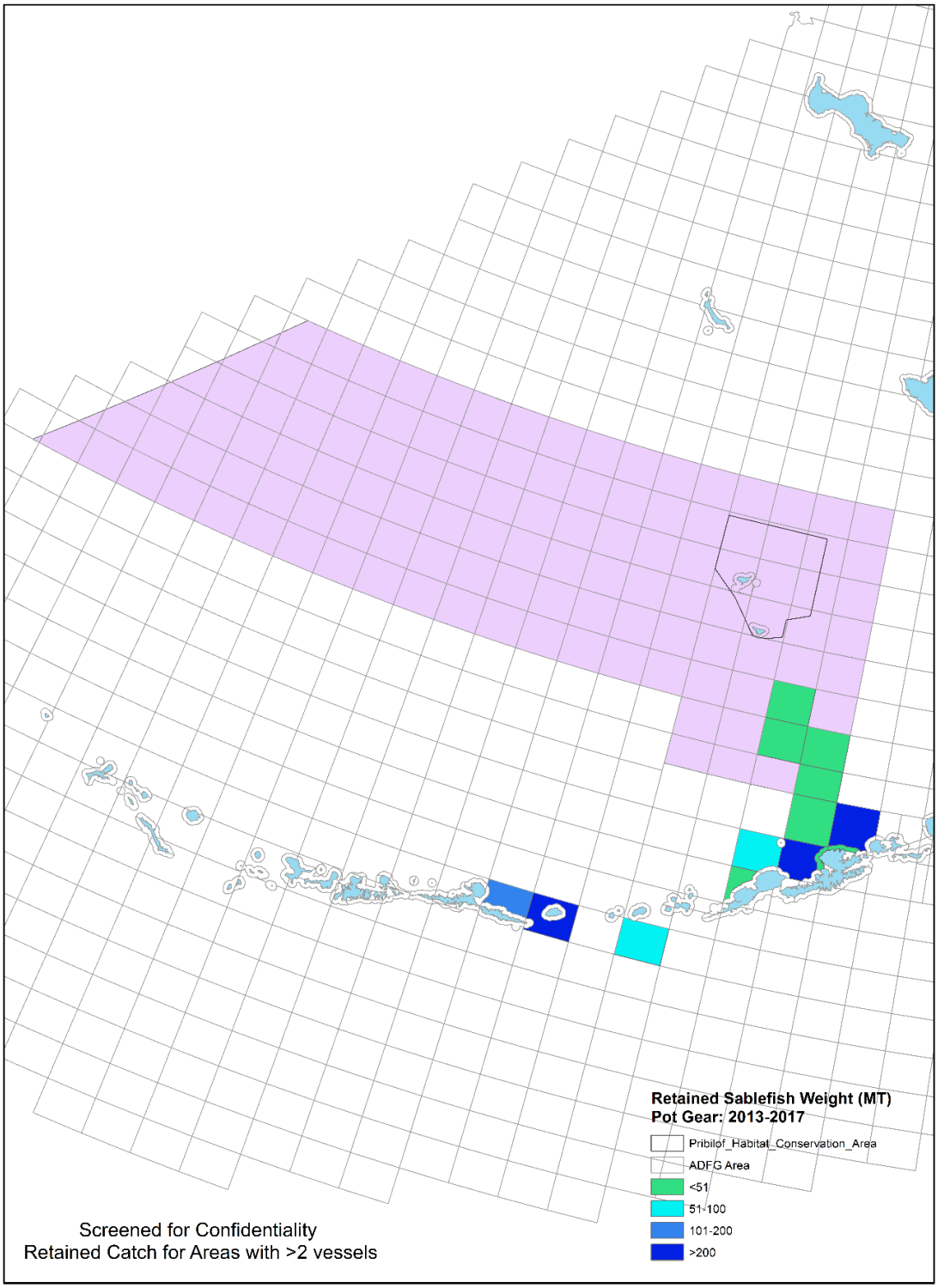
Any increase in pot fishing over status quo in the PIBKC stock boundary area would likely increase the risk of blue king crab bycatch and therefore have adverse impacts on rebuilding PIBKC stocks. Another scenario is that PIBKC bycatch could be observed on a vessel fishing retaining halibut outside of the conservation area, which would result in the observer data being used to estimate for the entire stock area. This would result in that information being used to estimate total mortality. Since there is some

[28] NMFS Catch Accounting.

overlap between observed blue king crab and potential fishing areas within the stock area, and pot gear is likely more effective at catching crab than hook-and-line gear, there is a potential for an increase in bycatch. However, comparing Figure 18 and Figure 19 with Figure 17, the overlap in pot fishing and crab distribution appears limited, with areas with higher crab rates not overlapping with potential halibut and sablefish areas.

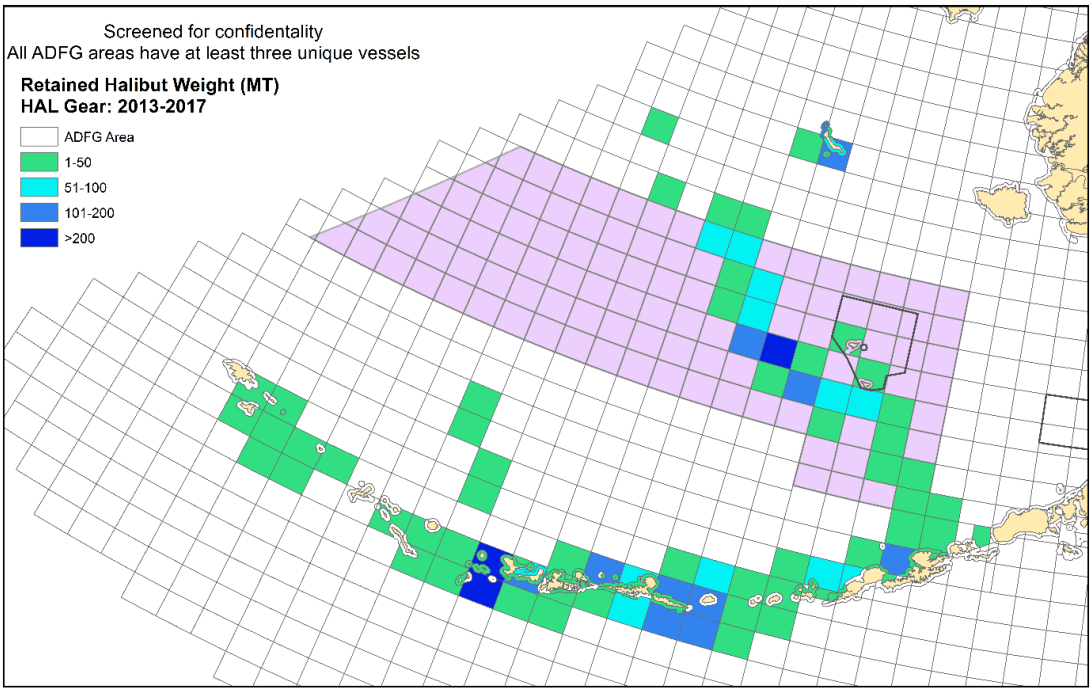
NMFS has identified the PIHCZ as the highest concentration of PIBKC (NMFS 2014). Pot gear in this area should be prohibited to further reduce the risk that overfishing could occur. Sablefish pot gear is most likely to be used in areas that are outside of the PIBKC stock boundary areas (see Figure 18 and Figure 19). If NMFS determines that sablefish pots had high incidental catch of PIBKC, NMFS in-season management could close fishing in areas that correspond to the PIBKC stock boundary, but that authority does not extend to the halibut fishery.

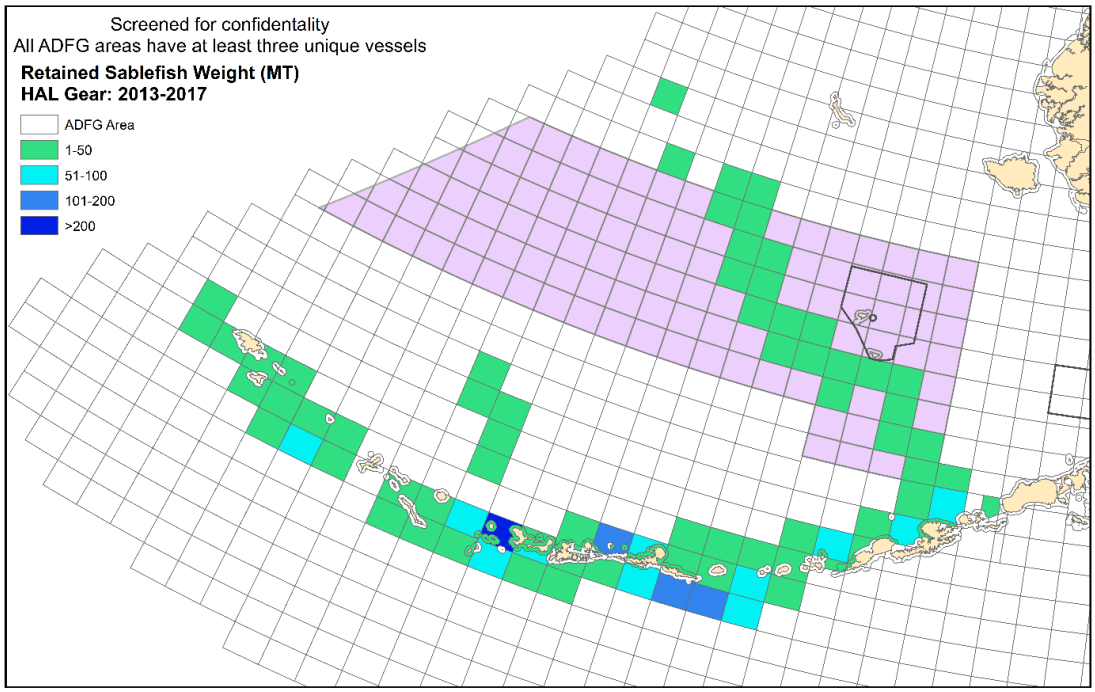
Figure 18 Sablefish Harvest by Pot Gear in BSAI (in mt) 2013-2017



Note: Purple shaded area illustrates the PIBKC stock boundary

Figure 19 Halibut and Sablefish Harvest by Hook and Line Vessels in BSAI (in mt) 2013-2017





Note: Purple shaded area illustrates the PIBKC stock boundary

3.7 Incidental Catch in the Sablefish and Halibut Fisheries

There are a number of different terms referring to the incidentally catch of species in fisheries of the EEZ. In this section we make the following distinctions: FMP-managed secondary species are groundfish species that do not dominate the catch but may still, in some cases be retained (some of these groundfish species may be retained up to a certain cap called a maximum retainable amount (MRA)). Non-target species are not managed under an FMP, including species such as seastars and eelpouts for which there is no significant market and generally no retention. Incidental catch can also include Prohibited Species Catch (PSC), species for which there is a significant market, but retention is prohibited (with the exception of some non-market-based donation programs).

Table 8 demonstrates the incidental catch of FMP-managed species (plus halibut) in the BSAI fixed gear fisheries targeting sablefish, halibut fishery, and Pacific cod. This table does not show trends in the time series (due to a large amount of confidential data) but consolidates catch data from 2015 through 2017. These species are managed under the BSAI Groundfish FMP. None of these species are either overfished or experiencing overfishing. Further information on these groundfish species and, for some, their directed fisheries can be found in the most recent BSAI Groundfish SAFE Report.

Table 9 and Table 10 highlight the non-market species and PSC (respectively) that are caught incidentally in the BSAI fixed gear fisheries targeting sablefish, halibut fishery, and Pacific cod complying catch data from 2015 through 2017. Note that these BSAI fixed gear fisheries have virtually no non-Chinook salmon or herring PSC.

In particular, the composition of bycatch species caught in observed pots that retained sablefish in BSAI is comprised mostly of arrowtooth/Kamchatka flounder, Greenland turbot, Pacific halibut, giant grenadier, and snails (Table 8 and Table 9). As discussed more in Section 3.5.6.2, the BSAI sablefish pot fishery also catches low rates of halibut PSC. Sablefish pots in the BSAI have caught PSC of golden king crab, as well as some *C. bairdi*, red and blue king crab (Table 10).

The halibut HAL fishery has more vessels and a greater overall volume of catch in the BSAI than the sablefish pot fishery. Primary non-halibut species caught in HAL gear include skates, Pacific cod, sablefish, sculpins, several types of rockfish, arrowtooth/Kamchatka flounder, Greenland turbot, and octopus (Table 8). This fishery also catches giant grenadier and sea stars (Table 9) and has some crab PSC (primarily golden king crab, but also *C. bairdi*, red and blue king crab) as shown in Table 10.

Table 8 FMP- managed groundfish species (and halibut) catch (in mt) in the sablefish, halibut, and Pacific cod BSAI fixed gear fisheries, cumulative 2015 through 2017

Gear type	FMP-managed species	Halibut	Pacific Cod	Sablefish
HAL	Arrowtooth Flounder	54.3	1,756.7	6.1
	Atka Mackerel	0.5	55.2	*
	BSAI Alaska Plaice		1.0	
	BSAI Kamchatka Flounder	23.1	143.7	6.6
	BSAI Other Flatfish	2.7	170.3	5.8
	BSAI Rougheye Rockfish	13.5	89.0	1.0
	BSAI Shortraker Rockfish	56.0	46.7	6.8
	BSAI Skate	948.3	76,707.9	44.5
	Flathead Sole	0.2	1,516.9	0.0
	Greenland Turbot	29.6	260.2	19.4
	Halibut	7,448.3	1.0	100.4
	Northern Rockfish	0.2	147.9	
	Octopus	16.6	122.6	0.2
	Other Rockfish	96.2	146.8	131.6
	Pacific Cod	455.0	386,832.8	27.3
	Pacific Ocean Perch	0.1	12.8	0.1
	Pollock	1.6	20,582.2	0.1
	Rock Sole	0.4	112.1	
	Sablefish	298.2	101.9	748.9
	Sculpin	190.2	5,395.1	0.1
	Shark	13.3	124.3	
	Squid		0.1	
	Yellowfin Sole		4,701.8	
POT	Arrowtooth Flounder		3.8	17.5
	Atka Mackerel		19.5	
	BSAI Alaska Plaice		0.0	*
	BSAI Kamchatka Flounder		0.3	6.1
	BSAI Other Flatfish		25.6	0.2
	BSAI Rougheye Rockfish			*
	BSAI Shortraker Rockfish			0.4
	BSAI Skate		0.1	0.4
	Flathead Sole		3.8	
	Greenland Turbot		0.5	10.4
	Northern Rockfish		0.9	
	Octopus		1,080.2	*
	Other Rockfish		9.6	1.2
	Pacific Cod		134,045.5	*
	Pacific Ocean Perch		0.2	
	Pollock		64.4	*
	Rock Sole		8.0	
	Sablefish		2.4	934.7
	Sculpin		735.1	*
	Shark			*
	Squid		0.1	
	Yellowfin Sole		610.3	

Source: NMFS AKRO Blend/Catch Accounting System via AKFIN.
Notes: Confidential data = *

Table 9 Non-target species catch (in mt) in the sablefish, halibut, and Pacific cod BSAI fixed gear fisheries, cumulative 2015 through 2017

Gear type	Species	Halibut	Pacific Cod	Sablefish
HAL	Benthic urochordata	1.4	142.8	
	Bivalves	0.4	22.2	0.0
	Brittle star unidentified	0.0	2.5	0.0
	Corals Bryozoans - Corals Bryozoans Unidentified	3.9	18.8	4.1
	Corals Bryozoans - Red Tree Coral		*	
	Eelpouts		267.4	0.4
	Giant Grenadier	452.3	586.7	1,172.2
	Greenlings	0.2	1.8	
	Grenadier - Rattail Grenadier Unidentified	6.1	79.9	44.3
	Gunnels		0.0	
	Hermit crab unidentified	0.0	0.7	
	Invertebrate unidentified	0.3	18.5	*
	Misc crabs	0.1	3.3	0.2
	Misc crustaceans	0.0	0.1	
	Misc fish	1.9		*
	Misc inverts (worms etc)		0.0	
	Polychaete unidentified		0.2	
	Scypho jellies		19.2	0.0
	Sea anemone unidentified	1.1	569.5	0.0
	Sea pens whips	0.2	145.7	0.0
	Sea star	73.8	1,865.8	0.2
	Snails	3.5	127.8	0.0
	Sponge unidentified	5.0	35.6	3.0
	State-managed Rockfish	2.1	0.8	
	Stichaeidae		0.0	
	urchins dollars cucumbers	1.0	5.1	0.1
Pot	Benthic urochordata		0.0	
	Bivalves		1.9	
	Brittle star unidentified		0.3	
	Corals Bryozoans - Corals Bryozoans Unidentified		0.1	0.0
	Eelpouts		1.8	
	Giant Grenadier			*
	Greenlings		0.9	
	Grenadier - Rattail Grenadier Unidentified			0.0
	Hermit crab unidentified		3.5	0.0
	Invertebrate unidentified		0.0	
	Misc crabs		21.3	1.6
	Misc crustaceans		0.0	
	Misc deep fish			0.0
	Misc fish		43.1	0.5
	Scypho jellies		56.3	0.0
	Sea anemone unidentified		0.7	0.0
	Sea star		140.1	1.6
	Snails		64.0	3.7
	Sponge unidentified		0.5	0.1
	State-managed Rockfish		0.1	
	urchins dollars cucumbers		3.5	*

Source: NMFS AKRO Blend/Catch Accounting System via AKFIN.
Notes: Confidential data = *

Table 10 Prohibited species catch (PSC) in the sablefish, halibut, and Pacific cod BSAI fixed gear fisheries, cumulative 2015 through 2017

	HAL			Pot	
PSC species	Halibut	Pacific Cod	Sablefish	Pacific Cod	Sablefish
Halibut mortality (mt)		2.1	0.3	6.8	0.3
Blue king crab (count)	63	1	1	21,401	178
C. bairdi crab (count)	12	106	20	885,727	757
Chinook PSC (count)	0	0	5	0	0
Golden king crab (count)	755	1	99	22,529	41,579
Red king crab (count)	206	34	146	107,862	69

Source: NMFS AKRO Blend/Catch Accounting System via AKFIN

3.7.1 Alternative 1

Under the No Action alternative, the amount and composition of bycatch species in the sablefish IFQ/CDQ pot fishery would not be expected to change. In addition, the amount and composition of bycatch species in the HAL halibut IFQ/ CDQ fisheries would not be expected to change. Continued prohibition on halibut retention in pot gear in the BSAI would not be expected to change (increase or decrease) the fishing mortality on other fish species, as hooked fish would continue to be preyed upon by whales, retained by the vessel, or discarded. These mortalities are accounted for in the management of the species under the BSAI Groundfish FMP, which is designed to prevent negative effects to groundfish stocks. Total catch of targeted groundfish is managed to prevent exceeding ABCs.

3.7.2 Alternative 2

Halibut IFQ and CDQ retention in pot gear in the BSAI sablefish pot fishery could decrease the amount of halibut IFQ and CDQ HAL retention proportionately. This may result in a shift in the amount and composition of bycatch species, corresponding with the decrease in halibut IFQ or CDQ caught on HAL gear.

If the retention of halibut in sablefish pot gear remains incidental to the sablefish fishery (i.e., the 9-inch excluder is still required, soak time and the footprint of the BSAI sablefish and Area 4 halibut fisheries remains the same), as demonstrated in Table 10, the generally low levels of halibut caught in BSAI sablefish pot gear means this would likely have a *de minimis* impact on the bycatch in the halibut HAL fishery. Since the only behavior change in the BSAI sablefish pot fishery would be the retention of an otherwise discarded species, there would be no other bycatch changes expected in BSAI sablefish pot fishery.

If a non-negligible amount of halibut IFQ/ CDQ harvest shifts to pot gear, there could be a shift in the magnitude of bycatch, the size selectivity, and species composition of bycatch that are observed. Some information can be gleaned from comparing bycatch of BSAI FMP species in the BSAI sablefish pot fishery to bycatch using other gear types. For instance, there may be a decrease (by some amount) of skates, rockfish, sculpins, and Pacific cod, which are typically caught on HAL, and less prevalent in pot gear. Pot gear has shown to have higher rates of crab PSC; and there may be more crab PSC catch with a shift in halibut harvest, especially if the vessel moves to habitat and depth more suitable for legal-size halibut.

Pacific cod are targeted at depths more similar to halibut. Consequently, the bycatch of the BSAI Pacific cod pot fishery can provide a helpful comparison. As demonstrated in Table 8 and Table 9, bycatch in the Pacific cod pot fishery includes primarily Northern rockfish, sculpins, yellowfin sole, pollock, other flatfish, Atka mackerel, with sea stars, and snails. The BSAI Pacific cod pot fishery also catch crab PSC, chiefly *C. bairdi*, but also red, blue and golden king crab (Table 10).

This fishery may also not be a perfect representation of possible bycatch in an IFQ/ CDQ fishery that allows halibut retention in pot gear, particularly if the Council adopts Alternative 2, Element 3 and allows the participants an exemption to the requirement to have a 9-inch excluder. Pot gear used in the BSAI Pacific cod fishery is required to have a 9-inch halibut excluder as well.

The removal of the excluder (or a change in the tunnel size) could affect the amount of bycatch and the size selectivity of the bycatch. It may increase the overall amount of larger bycatch, while allowing for some of the smaller bycatch species of bycatch to escape. Generally, it is expected the increase of the tunnel size would increase the crab bycatch and possibly other flatfish species. There is a possibility it may also affect the types of species that enter and are retained in pot gear, for example pot gear with a larger tunnel opening may catch sleeper sharks (personal communication, D. Hanselman, 2018).

Even if halibut can be effectively harvested with pot gear in the BSAI (e.g., pots are designed to more effective catch halibut, single pots are deployed, and vessels move to habitat more suitable for halibut) it is not expected that there will be a large shift from prosecuting the fishery with HAL rather than pot gear. As further explained in Section 4.7.1, there are several barriers to entry in using this opportunity including: access to halibut IFQ/ CDQ, access to sablefish IFQ/ CDQ, and access to a vessel that can safely deploy pot gear in the BSAI. Moreover, the Council's motion includes direction to review the effects of allowing retention of halibut in pot gear three years after implementation. At this point, catch data should reveal any changes to bycatch species or rates from the status.

3.8 Marine Mammals

3.8.1 Status of Marine Mammals in BSAI

Alaska supports one of the richest assemblages of marine mammals in the world. Twenty-two species are present from the Carnivora, superfamilies Pinnipedia (seals, sea lions, and walrus), Ursoidea (polar bears), and Musteloidea (sea otters), and from the order Artiodactyla, infraorder Cetacea (whales, dolphins, and porpoises). Some marine mammal species are resident throughout the year, while others migrate into or out of Alaska fisheries management areas. Marine mammals occur in diverse habitats, including deep oceanic waters, the continental slope, and the continental shelf, including inshore waters (Muto et al. 2017; Lowry, Frost et al. 1982). The National Marine Fisheries Service (NMFS) maintains management authority for all marine mammal species in Alaska, while the U.S. Fish and Wildlife Service (USFWS) is the designated management authority for northern polar bears, Pacific walrus, and northern sea otter.

The Marine Mammal Protection Act (MMPA) was enacted in 1972 to address mortality and serious injury (M/SI) of marine mammals incidental to commercial fishing operations. The 1994 MMPA Amendments established a requirement for fisheries to reduce incidental M/SI of marine mammals to insignificant levels approaching a zero rate, commonly referred to as the Zero Mortality Rate Goal (ZMRG). ZMRG is considered to be met for a marine mammal stock when the M/SI level from all commercial fisheries is 10% (or below) of the Potential Biological Removal level (PBR) of that marine mammal stock (69 FR 43338, July 20, 2004). The level of serious injury and mortality (but not non-serious injury) that result from the entanglements is compared to the overall population level and the PBR for each marine mammal stock to evaluate whether the serious injury/mortality will have a deleterious effect at a population (stock) level. Likewise, the Endangered Species Act (ESA) was enacted with two major goals: (1) Protect endangered species on the brink of extinction and threatened species that are likely to be on the brink of extinction in the near future and pursue their recovery; and (2) Conserve candidate species and species-of-concern so that listing under the ESA is not necessary.

Under the MMPA a "population stock" is the fundamental unit of legally-mandated conservation and is defined as "a group of marine mammals of the same species or smaller taxa in a common spatial arrangement, which interbreed when mature." Stocks are identified in a manner consistent with the management goals of the MMPA which include (1) preventing stocks from diminishing such that they cease to be a significant functioning element in the ecosystem of which they are a part or below their optimum sustainable population keeping the carrying capacity of the habitat in mind; and (2) maintaining the health and stability of the marine ecosystem. Therefore, a stock is also recognized as being a management unit that identifies a demographically isolated biological population. While many types of information can be used to identify stocks of a species, it is recognized that some identified stocks may fall short of that threshold due to a lack of information.

The most recent stock status and fishery interaction information is available in the Marine Mammal Stock Assessment Reports, which are published annually for all stocks that occur in state and federal waters of the Alaska region (SARs; NMFS 2017, Muto et al. 2017). Individual SARs provide information on each stock's geographic distribution, population estimates, population trends, and estimates of the potential biological removal (PBR) levels for each stock. The SARs identify sources of human-caused mortality, including serious injury and mortality in commercial fishery operations, by fishery, and whether the stock has met ZMRG for all fisheries. The SARs also include the stock's ESA listing status and MMPA depleted and strategic designations. Strategic stock SARs are updated annually, and SARs for non-strategic stocks are updated every three years or when significant new information is available.

Under the ESA species, subspecies, and distinct population segments (DPS) are eligible for listing as a threatened or endangered species. The ESA defines a "species" as "any subspecies of fish or wildlife or plants, and any DPS of any species of vertebrate fish or wildlife which interbreeds when mature". The joint USFWS /NMFS DPS policy (61 FR 4722; February 7, 1996) establishes two criteria that must be met for a population or group of populations to be considered a DPS: (1) The population segment must be discrete in relation to the remainder of the species (or subspecies) to which it belongs; and (2) the population segment must be significant to the remainder of the species (or subspecies) to which it belongs.

A population segment of a vertebrate species may be considered discrete if it satisfies either one of the following conditions: (1) it is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the ESA. Significance determinations are made using available scientific evidence of the population's biological and ecological importance to the taxon to which it belongs. This may include, but is not limited to, one or more of the following: (1) persistence of the discrete population segment in an ecological setting unusual or unique for the taxon; (2) evidence that loss of the discrete population segment would result in a significant gap in the range of the taxon; (3) evidence that the discrete population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historic range; or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics. It is important to note that the MMPA stock designations and ESA DPS designations for a given species do not necessarily overlap due to differences in the defining criteria for each.

The Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (PSEIS) (NMFS 2004) provides descriptions of the range, habitat, and diet for marine mammals found in waters off Alaska. The 2015 PSEIS Supplemental Information Report (NMFS 2015) provides updates on changes to marine mammal stock or species-related management and status, as well as new information

regarding impacts on marine mammal stocks and new methods to assess impacts. The information from the PSEIS and the SARs is incorporated by reference.

The Alaska Groundfish Harvest Specifications EIS provides information on the effects of the groundfish fisheries on marine mammals (NMFS 2007) and has been updated with the 2017 Supplemental Information Report (SIR).[29] These documents are all incorporated by reference. Additionally, the List of Fisheries (LOF) includes information on specific incidental takes of marine mammals in individual commercial fisheries.[30] Marine mammal bycatch data from the Alaska groundfish fisheries from 1998-2004 is provided in a 2006 NOAA Technical Memorandum (Perez et al. 2006). Perez et al. (2006) also describe the nature of marine mammal bycatch in the fisheries, the methods used to document marine mammal interactions with fishing gear and the methods used to extrapolate the fishery observer data to the entire fisheries.

A number of conservation concerns and/or management determinations may be related to marine mammals and the potential impacts of fishing. For individual species, these concerns or determinations may include—

- Protection under the ESA:
    - listed as endangered or threatened
    - placed on NMFS' list of "species of concern" or designated as a "candidate species" for ESA listings;
- Protection under the MMPA:
    - designated as a depleted or strategic stock;
    - focus of a Take Reduction Plan;
- Other:
    - declining or depressed populations in a manner of concern to State or Federal agencies;
    - large bycatch or other mortality related to fishing activities; or
    - vulnerability to direct or indirect adverse effects from some fishing activities.

Marine mammal stocks, including those currently listed as endangered or threatened under the ESA, that are present in the BSAI are listed in Table 11 and Table 12**.**

[29] The SIRs are available at https://alaskafisheries.noaa.gov//fisheries/groundfish-harvest-specs-eis. The 2017 report is available at: https://alaskafisheries.noaa.gov/sites/default/files/bsai_goa_sir_2017.pdf

[30] The List of Fisheries is available at http://www.nmfs.noaa.gov/pr/interactions/fisheries/2017_list_of_fisheries_lof.html

Table 11 Marine mammals known to occur in the Aleutian Islands subarea

Infraorder or Superfamily	Species	MMPA Stock	ESA or MMPA Status	ZMRG Status (all fisheries)
Pinnipedia	Steller sea lion *(Eumatopias jubatus)*	Western U.S	Endangered, Depleted, Strategic	Not Met
	Northern fur seal *(Callorhinus ursinus*)	Eastern Pacific	Depleted, Strategic	Met
	Harbor seal *(Phoca vitulina)*	Aleutian Isalnds	None	Unknown
	Ribbon seal *(Phoca fasciata)*	Alaska	None	Met
	Northern elephant seal *(Mirounga angustirostris)*	California***	None	Met
Cetacea	Killer whale *(Orcinus orca)*	Eastern North Pacific Alaska Resident	None	Met
		Eastern North Pacific GOA, Aleutian Islands, and Bering Sea transient	None	Met
		Offshore***	None	Unknown*
	Pacific White-sided dolphin (*Lagenorhynchus obliquidens*)	North Pacific	None	Unknown*
	Harbor porpoise *(Phocoena phoecena)*	Bering Sea	Strategic	Unknown*
	Dall's porpoise (*Phocoenoides dalli*)	Alaska	None	Unknown
	Sperm whale (*Physeter macrocephalus*)	North Pacific	Endangered, Depleted, Strategic	Unknown
	Baird's beaked whale (*Berardius bairdii*)	Alaska	None	Unknown*
	Cuvier's beaked whale (*Ziphius cavirostris)*	Alaska	None	nknown*
	Stejneger's beaked whale (*Mesoplodon stejnegeri*)	Alaska	None	Unknown*
	Gray whale *(Eschrichtius robustus)* ***	Eastern North Pacific***	None	Met
	Humpback whale *(Megaptera novaeangliae)* †	Western North Pacific‡	Endangered, Depleted, Strategic	Not Met
		Central North Pacific ‡‡	Mexico DPS-Threatened, Depleted, Strategic Hawaii DPS - None	Not Met
	Fin whale *(Balaenoptera physalus)*	Northeast Pacific	Endangered, Depleted, Strategic	Unknown*
	Minke whale *(Balaenoptera acutorostrata)*	Alaska	None	Unknown*
	North Pacific right whale *(Eubalaena japonica)*	Eastern North Pacific	Endangered, Depleted, Strategic	Met
	Blue whale *(Balaenoptera musculus)*	Eastern North Pacific***	Endangered, Depleted, Strategic	Met
	Sei whale *(Balaenoptera borealis)*	Eastern North Pacific***	Endangered, Depleted, Strategic	Met
Mustelidae	Northern sea otter *(Enhydra lutris)*	Southwest Alaska	None	Unknown**

Sources: Muto et al. 2017; List of Fisheries for 2017 (January 12, 2017 82 FR 3655).
*Unknown due to unknown abundance estimate and PBR.
** Unknown due to inadequate observer coverage;
*** This stock is found in the Pacific, rather than in the Alaska, SAR.
† On September 8, 2016, NMFS published a final decision revising the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. In the 2016 decision, NMFS recognized the existence of 14 DPSs, classified several as endangered and one as threatened, and determined that the remaining DPSs do not warrant protection under the ESA. Three DPSs of humpback whales occur in waters off the coast of Alaska: the Asia/2nd Western North Pacific (WNP) DPS, which is endangered, the Mexico DPS, which is threatened, and the Hawaii DPS, which is not protected under the ESA. Whales from these three DPSs overlap to some extent on feeding grounds off Alaska. As of October 2016, the MMPA stock designations of humpback whales found in Alaska have not been updated to reflect the newly-designated DPSs.
‡ Corresponds to the new Asia/ 2nd WDPS (endangered)
‡‡ Includes the New Mexico (threatened) and Hawaii DPSs (not protected under the ESA).

Table 12 Marine mammals known to occur in the Bering Sea

Infraorder or Superfamily	Species	MMPA Stock	ESA or MMPA Status	ZMRG Status (all fisheries)
Pinnipedia	Steller sea lion *(Eumatopias jubatus)*	Western U.S	Endangered, Depleted, Strategic	Not Me
	Northern fur seal *(Callorhinus ursinus*)	Eastern Pacific	Depleted, Strategic	Met
	Harbor seal *(Phoca vitulina)*	Pribilof Islands	None	Unknown**
		Bristol Bay	None	Unknown**
	Ribbon seal *(Phoca fasciata)*	Alaska	None	Met
	Bearded seal *(Erignathus barbatus nauticus)*	Alaska	Threatened, depleted, strategic©	Unknown*
	Spotted seal *(Phoca largha)*	Alaska	None#	Met
	Ringed seal *(Phoca hispida)*	Alaska	Threatened¥	Unknown*
	Pacific Walrus *(Odobenus rosmarus divergens)*	Alaska	Strategic§	Met
Cetacea	Killer whale *(Orcinus orca)*	Eastern North Pacific Alaska Resident	None	Met
		Eastern North Pacific GOA, Aleutian Islands, and Bering Sea transient	None	Met
		Offshore***	None	Unknown*
	Pacific White-sided dolphin (*Lagenorhynchus obliquidens*)	North Pacific	None	Unknown*
	Harbor porpoise *(Phocoena phoecena)*	Bering Sea	Strategic	Unknown*
	Dall's porpoise (*Phocoenoides dalli*)	Alaska	None	Unknown*
	Beluga whale *(Delphinapterus leucas)*	Beaufort Sea	None	Met
		Eastern Chukchi Sea	None	Met
		Eastern Bering Sea	None	Unknown*
		Bristol Bay		Unknown**
	Baird's beaked whale (*Berardius bairdii*)	Alaska	None	Unknown*
	Stejneger's beaked whale (*Mesoplodon stejnegeri*)	Alaska	None	Unknown*
	Sperm whale (*Physeter macrocephalus*)	North Pacific	Endangered, Depleted, Strategic	Unknown*
	Bowhead whale *(Balaena mysticetus)*	Western Arctic (Also known as Bering-Chukchi-Beaufort stock)	Endangered, Depleted, Strategic	Met
	Humpback whale *(Megaptera novaeangliae)* †	Western North Pacific‡	Endangered, Depleted, Strategic	Not Met
		Central North Pacific ‡‡	Threatened, Depleted, Strategic‡‡	Not Met
	Fin whale *(Balaenoptera physalus)*	Northeast Pacific	Endangered, Depleted, Strategic	Unknown*
	Minke whale *(Balaenoptera acutorostrata)*	Alaska	None	Unknown*
	North Pacific right whale *(Eubalaena japonica)*	Eastern North Pacific	Endangered, Depleted, Strategic	Met****
	Blue whale *(Balaenoptera musculus)*	Eastern North Pacific***	Endangered, Depleted, Strategic	Met
Mustelidae	Northern sea otter *(Enhydra lutris)*	Southwest Alaska	Threatened, Depleted, Strategic	Met
Ursoidea	Polar Bear *(Ursus maritimus)*	Chukchi/Bering Sea	Threatened, Depleted, Strategic	Met

Sources: Muto et al. 2017; List of Fisheries for 2017 (January 12, 2017 82 FR 3655).
* Unknown due to unknown abundance estimate and PBR.
** Unknown due to inadequate observer coverage or unreliable SI/M estimate.
*** This stock is found in the Pacific, rather than in the Alaska, SAR.
**** The PBR for the North Pacific right whale is calculated but considered unreliable. However, there are no known fishery-related SI/M.
† On September 8, 2016, NMFS published a final decision revising the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. In the 2016 decision, NMFS recognized the existence of 14 DPSs, classified several as endangered and one as threatened, and determined that the remaining DPSs do not warrant protection under the ESA. Three DPSs of humpback whales occur in waters off the coast of Alaska: the Asia/2nd Western North Pacific (WNP) DPS, which is endangered, the Mexico DPS, which is threatened, and the Hawaii DPS, which is not protected under the ESA. Whales from these three DPSs overlap to some extent on feeding grounds off

Alaska. As of October 2016, the MMPA stock designations of humpback whales found in Alaska have not been updated to reflect the newly-designated DPSs.
‡ Corresponds to the new Asia/ 2nd WDPS (endangered).
‡‡ Includes the New Mexico (threatened) and Hawaii DPSs (not protected under the ESA).
Spotted seals: Three DPSs are identified, but only the Bering DPS occurs in US waters. Therefore, the Alaska stock identified under the MMPA SAR consists entirely of the Bering DPS.
© Bearded seals: Two DPSs are identified for this subspecies, but only the Beringia DPS occurs in US waters. Therefore, the Alaska stock identified under the MMPA SAR consists entirely of the Beringia DPS. The Beringia DPS was listed as threatened under the ESA in December 2012. In July 2014 the U.S. District Court vacated the listing. In October 2016 the US Court of Appeals for the 9th Circuit reversed the July 2014 decision returning the Beringia DPS to a threatened status under the ESA. In January 2018, the U.S. Supreme Court upheld this ruling.
¥ Ringed seals were listed as threatened under the ESA in December 2012. In March 2016 the U.S. District Court vacated the listing. In May 2016 NMFS appealed the March 2016 decision. The 9th Circuit Court of Appeals reinstated the threatened status on February 12, 2018.
§Walrus – A petition to list walrus under the ESA was determined to be warranted, but precluded by higher priorities (76 FR 7634, February 10, 2011). The USFWS is under court order to make a decision on the listing in 2017.

3.8.1.1 Marine mammal entanglement

Entanglements generally occur when whales encounter the buoy lines that extend from a trap or string of traps set on the ocean bottom to a buoy at the surface. Large whales, including North Atlantic right whales, humpback whales, fin whales, and grey whales, are particularly susceptible to becoming entangled in trap or pot gear due to spatial overlap with fisheries and their feeding behavior. Baleen whale entanglements in fishing gear, including pot gear, generally involve humpback whales, though incidental take of other baleen whale species have occurred. Overall, fewer killer, sperm, or other toothed whales have been entangled in all gear types, including pot gear.

One of the key factors important to the potential for marine mammal entanglements relates to the amount of slack line used and the profile of the lines in the water column. Generally, we expect lines that remain relatively tight and vertical are less likely to lead to an entanglement as opposed to lines that create larger profiles in the water if they are relatively loose and/or winding around in loops.

Through the annual List of Fisheries analysis, the level of serious injury and mortality (but not non-serious injury) that resulted from incidental take in commercial fisheries for each marine mammal stock is compared to the stock's PBR to evaluate whether the potential for a deleterious effect at a population (stock) level.

3.8.1.2 Marine Mammal Protections in the Alaska Groundfish Fisheries

Direct and indirect interactions between marine mammals and fishing vessels may occur due to overlap in the size and species of fish harvested in the fisheries that are also important marine mammal prey, and due to temporal and spatial overlap in marine mammal occurrence and commercial fishing activities. Of the species listed under the ESA and present in the BSAI, several species may be adversely affected by commercial groundfish fishing. These include: Steller sea lions, humpback whales, fin whales, and sperm whales (NMFS 2006a; NMFS 2010). Stocks designated as depleted or strategic under the MMPA, but not listed as threatened or endangered under the ESA, that may be vulnerable to being adversely affected by commercial fishing include northern fur seals and harbor porpoise. However, the BSAI and GOA groundfish FMPs contain many measures to protect marine mammals from potential effects of fishing, and several species are the subjects of continuing research and monitoring to further define the nature and extent of fishery impacts on them. Additionally, not all these species are expected to be affected by the action. Several marine mammal species are discussed in the following paragraphs, and any additional species from Tables 14 and 15 that are not included in this analysis do not generally overlap with the action area or the fishery. The following paragraphs describe why no significant impacts on specified species of marine mammals are expected with this action.

NMFS has completed ESA section 7 consultations for the Federal BSAI and GOA groundfish fisheries for all ESA-listed species, either individually or in groups. The last programmatic ESA section 7 consultation on the effects of the groundfish fisheries, as authorized by the BSAI groundfish FMP, was initiated in 2006 (NMFS 2006a) and completed in 2010 (NMFS 2010). On June 21, 2006, NMFS Alaska Region Protected Resources Division concluded that the groundfish fisheries were not likely to adversely affect the following listed marine mammal species or designated critical habitat: blue whale, right whale or designated right whale critical habitat, sei whale, or fin whale (NMFS 2006a). Additionally, the general habitat and ranges of blue, sei, and fin whales is not likely to overlap with areas where sablefish pots are deployed. NMFS Alaska Region Protected Resources Division concluded that the BSAI and GOA groundfish fisheries were likely to adversely affect Steller sea lions and designated critical habitat, humpback whales, and sperm whales (NMFS 2006a).

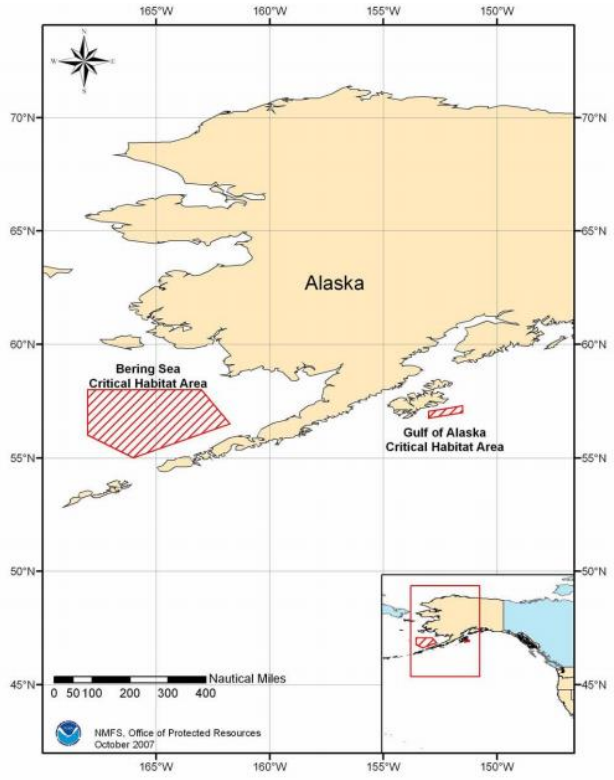
Subsequent to re-initiation of consultation, NMFS included fin whales in the formal ESA section 7 consultation which culminated with the release of a biological opinion which concluded that the BSAI and GOA groundfish fisheries were not likely to jeopardize the continued existence of the eastern DPS of Steller sea lion, the humpback whale, the sperm whale or the fin whale. The 2010 biological opinion (NMFS 2010) concluded that NMFS could not ensure that the BSAI and GOA groundfish fisheries were not likely to jeopardize the continued existence of the Steller sea lion western DPS of (WDPS) or adversely modify its designated critical habitat. Additional protection measures to conserve prey for Steller sea lions in the western and central Aleutian Islands and ensure that the fisheries were not likely to jeopardize the continued existence of the Steller sea lion WDPS or adversely modify its designated critical habitat were implemented in the fisheries in 2011 (76 FR 2027, January 12, 2011) and amended again in 2015 (79 FR 70286, November 25, 2014) following the completion of a biological opinion on the 2015 measures (NMFS 2014).

The USFWS listed the southwest Alaska DPS of the northern sea otter (northern sea otter SWDPS) as threatened under the ESA in 2005. In 2013, NMFS and the USFWS consulted on the effects of the BSAI and GOA groundfish fisheries on the northern sea otter GOA Sablefish IFQ Pot Longline Gear – October 2016 66 SWDPS and determined that the BSAI and GOA groundfish fisheries were not likely to adversely affect the endangered southwest Alaska DPS of the northern sea otter or designated critical habitat.

Although some northern fur seals are caught incidental to commercial fisheries, the number is low compared to the PBR. This action is not likely to affect the eastern Pacific population.

NMFS designated critical habitat for the North Pacific right whale on April 8, 2008 (73 FR 19000; Figure 20) and concluded on April 30, 2008 (NMFS 2008) that the fisheries in the BSAI and GOA were not likely to adversely affect the right whale or critical habitat. NMFS reached this conclusion because the density of fishing effort in the areas comprising North Pacific right whale critical is low compared to regions outside Alaska where right whale interactions have occurred, the low numbers of right whales in Alaska, and that most of the right whales appear to migrate from Alaska waters seasonally (though a few may come early or stay late or even over-winter) (NMFS 2017, Muto et al. 2017).

Figure 20 North Pacific Right Whale Critical Habitat



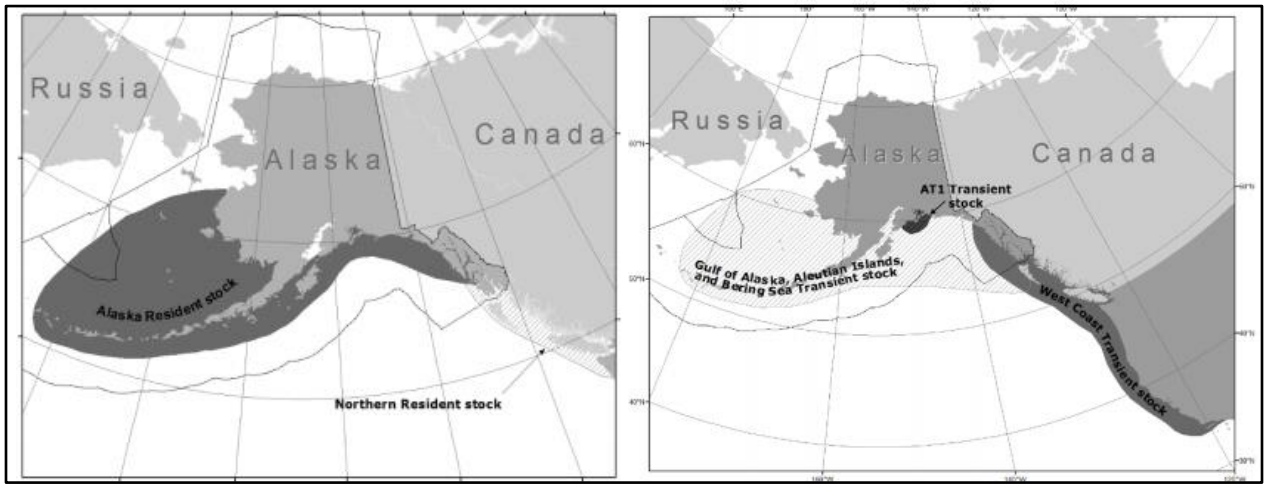
3.8.1.3 Killer Whale and Sperm Whale Stock Status

A more detailed discussion of sperm and killer whale status is warranted due to the interactions between sperm whales and killer whales in the sablefish pot fishery and IFQ HAL fishery (Section 3.8.2).

Abundance estimates for the Alaska resident, Eastern North Pacific GOA, Aleutian Islands, and Bering Sea transient killer whale stocks are largely unknown. The minimum abundance estimate for the Eastern North Pacific Alaska Resident stock is likely under-estimated because researchers continue to encounter new whales in the Alaskan waters. The most recent population estimate for resident killer whales in the Western Alaska region was 1,475 in 2013 (D. Hanselman, pers. comm. 2017). Seasonal and year-round occurrence has been noted for killer whales throughout Alaska (Braham and Dahlheim 1982).

Alaska Resident and Transient killer whales are found from southeastern Alaska to the Aleutian Islands and Bering Sea (Figure 21); those are the stocks which overlap with the action area. Resident killer whales in Western Alaska show strong long-term associations consistent with a matrilineal pattern and have been shown to exhibit a high degree of site fidelity over time, with ranges generally limited to around 200 km (Ford and Ellis 2006, Forney and Wade 2006, Fearnbach, 2012). Resident whales are those most likely to be involved in fishery interactions since these whales are known to be fish eaters, while transient killer whales generally feed on marine mammals. Fisheries observers report that large groups of killer whales in the Bering Sea follow vessels for days at a time, actively consuming the processing waste (NMFS-AFSC, Fishery Observer Program, unpubl. data), particularly on trawl vessels. Based on currently available data, a minimum estimate of the mean annual mortality and serious injury rate due to U.S. commercial fisheries (1 whale) is less than 10% of the PBR (10% of PBR = 2.4) and, therefore, is considered to be insignificant and approaching zero mortality and serious injury rate. A minimum estimate of the total annual level of human-caused mortality and serious injury (1 whale) is not known to exceed the PBR (24) (Muto et al. 2017).

Figure 21 Approximate distribution of resident and transient killer whales in the eastern North Pacific (shaded areas)

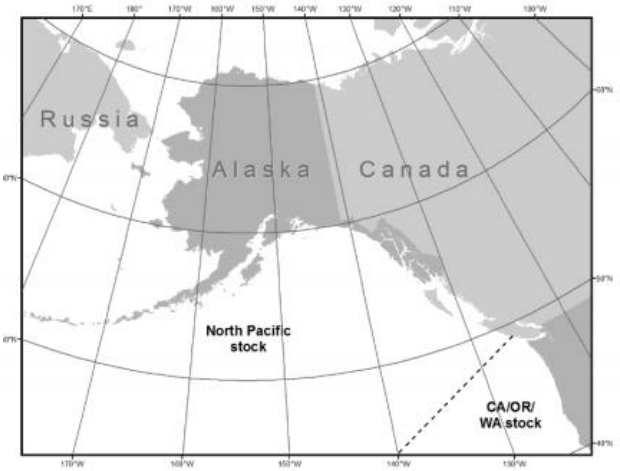


Source: AK Marine Mammals SAR, http://www.nmfs.noaa.gov/pr/sars/pdf/ak_2016_final_sars_june.pdf

In the North Pacific, sperm whales are distributed widely (Figure 22), with the northernmost boundary extending from Cape Navarin (62°N) to the Pribilof Islands (Omura 1955). Sperm whales generally inhabit waters 600 m or more depth. While females and young generally stay in tropical and temperate waters, males may be seen during the summer in the Gulf of Alaska, Bering Sea and throughout the Aleutian Islands (ADFG n.d.), where they feed on the rich biomass of the North Pacific. Sperm whales feed primarily on medium-sized to large-sized squids but also take substantial quantities of large demersal and mesopelagic sharks, skates, and fishes (Rice 1989).

Abundance and populations trends of sperm whales in Alaska waters are unknown. New estimates in the GOA indicate a population size of about 345 sperm whales, but no information on trend is available (Rone et al. 2017) because historical estimates of the abundance of sperm whales in the North Pacific are considered unreliable. Sighting surveys conducted by the Alaska Fisheries Science Center's Marine Mammal Laboratory (MML) in the summer months between 2001 and 2010 have found sperm whales to be the most frequently sighted large cetacean in the coastal waters around the central and western Aleutian Islands (MML, unpubl. data). While the PBR for the North Pacific sperm whale stock is unknown, there were five serious injuries of sperm whales observed in the Gulf of Alaska sablefish longline fishery from 2010-2014 (Muto et al. 2017). On the basis of total abundance, current distribution, and regulatory measures that are currently in place, it is unlikely that this stock is in danger of extinction (Braham 1992, as cited in Muto et al. 2017). According to the 2010 Biological Opinion (NMFS 2010), the potential for ship strikes is minimal and unlikely to result in an adverse population level effect for sperm whales in Alaska. Additionally, incidence of sperm whale entanglement in Alaska appears to be low and would not be expected to reach a level that would have population-level consequences (NMSF 2010).

Figure 22 The approximate distribution of sperm whales in the North Pacific includes deep waters south of 62°N to the equator



Source: AK Marine Mammals SAR, http://www.nmfs.noaa.gov/pr/sars/pdf/ak_2016_final_sars_june.pdf

3.8.2 Background on Whale Depredation

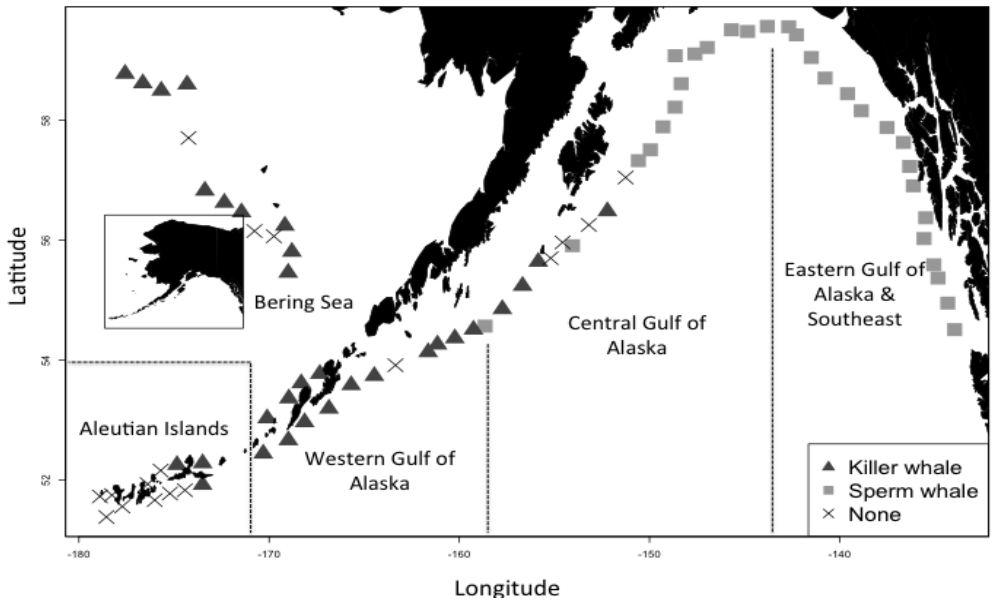
Depredation by killer whales and sperm whales is common in the Alaska sablefish and halibut IFQ fishery (Sigler et al. 2008; Peterson & Hanselman 2017; Peterson et al. 2014). While data on depredation of halibut discarded from sablefish pot gear is limited, testimony from fishery participants has consistently identified it as an issue, as it impedes efficient use of the resource. In 2008, the IPHC received a proposal that described high killer whale depredation of halibut that were discarded from sablefish pot gear, resulting in presumed high discard mortality and a loss to the halibut resource (Jay Herbert 2008). Other fishery participants state that whale depredation both of halibut discarded in the sablefish pot fishery as well as of halibut and sablefish hooked on longlines is an increasing problem (personal communication, R. Hanson 2018; personal communication, J. Kauffman 2018). In a study conducted by Peterson and Carothers (2013), 87% of longline fishermen surveyed perceived whale depredation as worsening between 1990 and 2010. While the direct effects of this action relate to depredation of halibut caught incidentally in sablefish pots, if the action were to allow more targeted effort of halibut in pots for those with access to sablefish quota, we would expect some shift from the HAL fishery to pot gear. Therefore, a discussion of whale depredation in the HAL fishery is important to set the stage for potential effects of this action.

Killer whale depredation of sablefish and halibut generally occurs in the BS, AI, and WGOA management areas, whereas sperm whale depredation tends to be more problematic in the Central and Eastern GOA (Figure 23, Figure 24, Table 13). Of the stations sampled by in the AFSC longline survey, all instances of sperm whale depredation in the BSAI have occurred in the Aleutian Islands (Table 13), and only male sperm whales have been observed taking fish from longlines (NMFS 2010; NPFMC 2017c). Killer whale depredation in the BSAI occurs where high-value longline fisheries overlap with regions supporting some of the greatest densities of "fish-eating" or resident killer whales in the world (Forney and Wade 2006, Fearnbach 2014), and whales seem to target fishing grounds with higher CPUEs (Peterson & Carothers 2013). Killer whales prey upon several groundfish species that are caught on longline gear in Western Alaska, including sablefish, Greenland turbot, arrowtooth flounder and Pacific halibut (Yano and Dalheim 1995, Peterson et al. 2013). This reduces catch rates and decreases the accuracy of fish stock assessments.

Development of technological solutions to deter whales and changes in fishing strategies can be costly, an inconvenience to fishery participants, and has not resolved the problem (Goetz et al. 2011, Guinet et al.

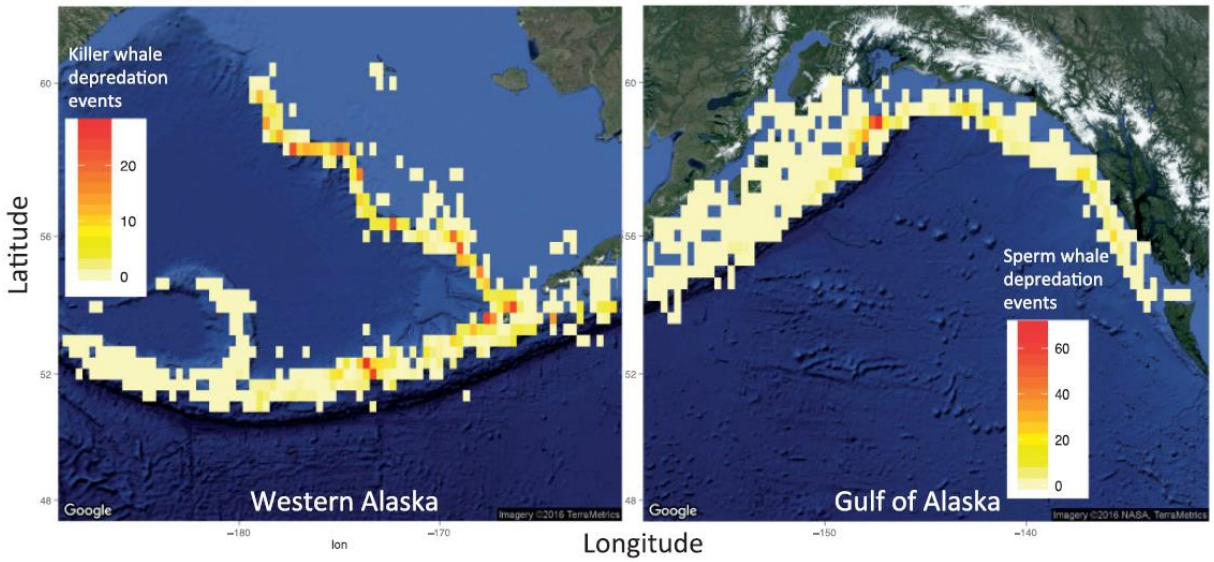
2014). In October 2006, fishermen and scientists from around the world, including sablefish fishermen and scientists from Alaska, participated in a depredation workshop focused on mitigating the effects of depredation. Workshop abstracts and summaries are available at: http://depredation.org. A second international depredation and bycatch mitigation workshop was held at the Woods Hole Oceanographic Institution in October 2013 (abstracts available at http://www.bycatch.org/node/796). A discussion of whale deterrent efforts can be found in the GOA Sablefish Pots Analysis from 2015 (NPFMC, 2016).

Figure 23 Depredation by whale species and sablefish management area based on NMFS longline survey, 1998-2011



Source: (Peterson and Carothers 2013)

Figure 24 NMFS observer data on depredation events counts by killer whales in western Alaska and sperm whales in the GOA



Source: (Peterson and Hanselman 2017)
Note: shown in 1/3-degree by 1/3-degree cells

Table 13 Count of stations where sperm (S) or killer whale (K) depredation occurred in the six sablefish management areas

	BS (16)		AI (14)		WG (10)		CG (16)		WY (8)		EY/SE (17)	
Year	S	K	S	K	S	K	S	K	S	K	S	K
1996			n/a	1	n/a	0	n/a	0	n/a	0	n/a	0
1997	n/a	2			n/a	0	n/a	0	n/a	0	n/a	0
1998			0	1	0	0	0	0	4	0		0
1999	0	7			0	0	3	0	6	0	4	0
2000			0	1	0	1	0	0	4	0	2	0
2001	0	5			0	0	3	0	2	0	2	0
2002			0	1	0	4	3	0	4	0	2	0
2003	0	7			0	3	2	0	1	0	2	0
2004			0	0	0	4	3	0	4	0	6	0
2005	0	2			0	4	0	0	2	0	8	0
2006			0	1	0	3	2	1	4	0	2	0
2007	0	7			0	5	1	1	5	0	6	0
2008			0	3	0	2	2	0	8	0	9	0
2009	0	10			0	2	5	1	3	0	2	0
2010			0	3	0	1	2	1	2	0	6	0
2011	0	7			0	5	1	1	4	0	9	0
2012			1	5	1	5	2	0	4	0	3	0
2013	0	11			0	2	2	2	3	0	7	0
2014			1	3	0	4	4	0	6	0	4	0
2015	0	9			0	5	6	0	6	0	7	0
2016			1	0	0	3	3	0	6	0	5	0
2017	0	11			1	2	4	0	3	0	9	0

Source: (Hanselman et al. 2017)
Note: The number of stations sampled that are used for relative population calculations are in parentheses. Areas not surveyed in a given year are left blank. If there were no whale depredation data taken, it is denoted with an "n/a."

More information exists on depredation of sablefish than of Pacific halibut, however, fishery participants in the BSAI report that the Pacific halibut commercial fisheries are heavily impacted by killer whale depredation. According to Peterson et al. (2013), the failure of models to show a significant effect on halibut catch rates in areas impacted by killer whale depredation may be a result of low sample size and lower Pacific halibut catches overall.

In a survey of Alaska longliners carried out by Peterson & Carothers (2013), the majority of respondents (70.7%) that reported interactions with killer whales (primarily western Alaska) estimated that depredation rates exceeded 40% of catch. In 2013, Peterson et al. used NMFS sablefish longline survey data to explore spatial and temporal trends in killer whale depredation and to quantify the effect of killer whale depredation on catches of groundfish species in the BS, AI, and WGOA. When killer whales were present during survey gear retrieval, whales removed an estimated 54% to 72% of sablefish, 41% to 84% of arrowtooth flounder and 73% of Greenland turbot. Overall sablefish catches (depredated and non-depredated sets) were lower by between 11% and 29% in all three management areas. During the study period from 1998-2011, the frequency of killer whale interactions remained stable in the BS while increasing in the AI and WG. The proportion of skates preyed upon significantly increased in the AI, and data in the BS showed no significant trend.

In follow-up studies by Peterson et al. (2014, 2017), the authors extended their analysis to evaluate the impacts of killer whale depredation on commercial longline fisheries in Western Alaska. Those studies applied a statistical modeling approach to NMFS observer data and fishermen-collected depredation data

to: (1) estimate the frequency of killer whale depredation of commercial longlines; (2) estimate depredation-related catch per unit effort reductions; and (3) assess direct costs and opportunity costs incurred by commercial longline fleets in Western Alaska as a result of killer whale interactions. The percentage of commercial fishery sets affected by killer whales was highest for sablefish in the BS (21%) and was relatively low in the AI and WGOA (approximately 2%).

In direct response to depressed CPUEs associated with killer whale depredation, commercial longliners reportedly react in two ways: dropping their gear back down to "wait the whales out," or moving to a different fishing site to avoid the whales (Peterson and Carothers 2013). Both avoidance measures result in reduced efficiency through increased operation costs and opportunity costs in lost time (extended soak times and distances traveled). Vessel operators in western Alaska reported waiting on average at least 12 hours and/or transiting 25 miles or more to avoid depredating killer whales (Peterson and Carothers 2013). These depredation avoidance measures can be costly for commercial longliners as they are forced to travel farther and stay on the grounds longer to catch the same amount of IFQ. In a study conducted with six longline vessels operating in Western Alaska in 2011 and 2012, killer whale depredation resulted in an estimated additional $1,016 per vessel-day for additional fuel, crew food and the opportunity cost of lost time (Peterson et al. 2014). Based on data from the observed commercial fishery, the additional cost associated with catching the same amount of fish on sets depredated by killer whales was estimated to be approximately $433 (± $147) per set for additional fuel alone. That estimate does not include additional crew time, bait or opportunity costs in other fishing or non-fishing activities (Peterson et al. 2014).

3.8.3 Effects on Marine Mammals

No beneficial impacts to marine mammals are likely with groundfish harvest. Generally, changes to the fisheries do not benefit marine mammals in relation to incidental take, prey availability, and disturbances; changes increase or decrease potential adverse impacts. The only exception to this may be in instances when marine mammals target prey from fishing gear, as described in Section 3.8.2. In this case, the prey availability is enhanced for these animals because they need less energy for foraging. However, that benefit may be offset by adverse effects from an increased potential for entanglement in the gear or other unknown risks from modified foraging behavior.

The following discussion focuses on the potential interaction of marine mammals with fishing gear currently used in the sablefish IFQ fishery in the BSAI. Specifically, this analysis focuses heavily on killer whales, which are known to depredate fish caught in the sablefish and halibut IFQ fisheries in the BSAI. These latter interactions reduce the efficiency of the fishery and may increase the likelihood of entanglement of these whales in fishing gear.

3.8.3.1 Alternative 1

Maintaining the current prohibition of the retention of legal-size halibut in (single or longline) pot gear in the BSAI is the status quo or No Action alternative. Continued use of currently allowed gear would not address the purpose and need statement for the action, which stresses the need to minimize fishery interactions with killer whales in the Bering Sea.

Under Alternative 1, there would be no expected changes in incidental take, prey availability, or disturbance effects.

Incidental Take Effects

Under the status quo in the BSAI, killer whales interfere with HAL fishing operations when they depredate longline gear. Due to this behavior, these species may be at greater risk of vessel strike and/or entanglement than marine mammals that do not interfere with these fishing operations.

Cetacean entanglements in longline fishing gear are rare. The likelihood of killer whale entanglements in longline gear is very low (Dalla Rosa and Sechi 2007). For killer whales, the minimum estimate of the total annual level of human-caused mortality and serious injury is not known to exceed the PBR, therefore we do not expect any significant population-level impacts from either alternative.

The BSAI halibut longline (HAL) and BSAI sablefish pot fisheries are listed in the List of Fisheries for 2017 as Category III,[31] with a remote likelihood of or no known interaction with any marine mammal species. In the last five years, no documented incidental takes of marine mammals have occurred in these fisheries. Based on the annual stock assessment reports, the potential take of marine mammals in the Alaska sablefish and halibut fisheries is well below the PBRs or a very small portion of the overall human caused mortality for those species for which a PBR has not been determined (Muto et al. 2017).

Under the status quo, there is potential for sablefish longliners to switch to pots even without a large increase in sablefish densities. All the above fisheries are Category III fisheries, and any shifting between gear types that occurs under Alternative 1 is not expected to have any significant effects on the incidental take of marine mammals.

Prey Availability Effects

Harvest of marine mammal prey species in the BSAI and GOA fisheries may limit foraging success through localized depletion, overall reduction in prey biomass, and dispersion of prey, making it more difficult for foraging marine mammals to obtain necessary prey. Overall reduction in prey biomass may be caused by removal of prey or disturbance of prey habitat. The timing and location of fisheries relative to foraging patterns of marine mammals and the abundance of prey species may be a more relevant management concern than total prey removals.

Diet data suggest that killer whales are not known to naturally forage for sablefish, likely due to the depth range of sablefish (Rice 1989). The impacts of altered foraging behavior, such as removing hooked fish from longline gear or preying upon fish discarded from fishing vessels, are unknown. Optimal foraging theory states that an animal wants to gain the most benefit (energy) for the lowest cost during foraging, so that it can maximize its fitness. Obtaining food provides the animal with energy, while searching for and capturing food require both energy and time. Depredation of fishing gear enables decreased energy expenditure required to forage for prey. Under Alternative 1, whale depredation is expected to continue as the status quo.

Several marine mammals may be impacted indirectly by effects that fishing gear may have on benthic habitat. Table 14 lists marine mammals that may depend on benthic prey and known depths of diving. Diving activity may be associated with foraging. The essential fish habitat (EFH) EIS states that very little information exists regarding the effects of HAL gear on benthic habitat, and published literature is essentially nonexistent (NMFS 2005). However, it is unlikely that the fishery would impact the benthic habitat enough to decrease marine mammal prey base to the extent that it would impact survival rates or reproductive success.

[31] The Proposed List of Fisheries for 2018 (82 FR 47424 October 10, 2017) would remove the Category III AK halibut longline/set line (state and Federal waters) fishery from the LOF as this fishery is covered by AK Gulf of Alaska halibut longline and AK BSAI halibut longline fisheries on the LOF, and the AK BSAI halibut longline fishery would be listed as a Category III fishery. This fishery is proposed for classification in Category III based on analogy to other halibut longline fisheries.

Overall, effects of Alternative 1 on prey availability for marine mammals are not likely to cause population level effects and are therefore not significant.

Table 14 Benthic dependent marine mammals, foraging locations, and diving depths

Species	Depth of diving and location
Ribbon seal	Mostly dive < 150 m on shelf, deeper off shore. Primarily in shelf and slope areas.
Harbor seal	Up to 183 m. Generally coastal.
Sperm whale	Up to 1,000 m, but generally in waters > 600 m.
Northern sea otter	Rocky nearshore < 75 m
Gray whale	Benthic invertebrates

Sources: Muto et al, 2017; Burns et al. 1981; http://www.adfg.state.ak.us/pubs/notebook/marine/rib-seal.php; http://www.afsc.noaa.gov/nmml/species/species_ribbon.php; http://www.adfg.state.ak.us/pubs/notebook/marine/harseal.php; http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/spermwhale.htm

Disturbance Effects

Disturbance effects from the groundfish fisheries described in the 2010 Biological Opinion include: disruption of normal foraging patterns by the presence and movements of vessels and gear in the water, abandonment of prime foraging areas because of fishing activities, and disruption of prey schools in a manner that reduces the effectiveness of marine mammals' foraging. The interaction of the BSAI groundfish fisheries with Steller sea lions, which potentially compete for prey, is comprehensively addressed in the Steller Sea Lion Protection Measures EIS and the 2010 Biological Opinion (NMFS 2014; NMFS 2010). NMFS concluded that status quo fisheries do not cause disturbance to marine mammals at a level that may cause population level effects, therefore Alternative 1 is not likely to have significant disturbance effects on marine mammals.

3.8.3.2 Alternative 2

Incidental Take Effects

As described in Alternative 1, the BSAI halibut longline (hook-and-line) and BSAI sablefish pots fisheries are listed as Category III [32]. In terms of Alternative 2, the potential magnitude and direction of impacts on marine mammals (specifically killer whales, since they are the predominant species associated with depredation of longlines in the BSAI) depends on not only changes in fishing behavior that are likely small but difficult to quantify, as well as how whales respond to any changes in fishery behavior. For example, if there is no or reduced incentive for the whales to be near fishing vessels because fewer halibut are being discarded, the likelihood of ship strike and entanglement would be expected to be reduced. However, we cannot predict whether whales may, in fact, remain longer with vessels that are still discarding halibut, or with those still catching halibut on longlines.

[32] The Proposed List of Fisheries for 2018 (82 FR 47424 October 10, 2017) would remove the Category III AK halibut longline/set line (state and Federal waters) fishery from the LOF as this fishery is covered by AK Gulf of Alaska halibut longline and AK BSAI halibut longline fisheries on the LOF, and the AK BSAI halibut longline fishery would be listed as a Category III fishery. This fishery is proposed for classification in Category III based on analogy to other halibut longline fisheries.

Under either alternative, we can continue to expect a small likelihood of interaction with marine mammals and sablefish pots. The likelihood of entanglement in any one line is the same, regardless of whether the line is part of a longline or attached to a pot. But if there is a shift in the amount of pots in the water due to a shift in fishery behavior, there could be more vertical lines in the water, which would mean an incremental and unknown increase in the probability of entanglement. Whales are more likely to be entangled in pot and line (single pots) than in longline pots due to the number of lines in the water, however, killer whales are not known to search for prey in pot gear, and Alternative 2 would reduce the opportunity for killer whales to take halibut from longlines or prey upon halibut discarded from sablefish pots. Therefore, Alternative 2 could reduce the risk of marine mammal entanglements in fishing gear, but it would depend on the behavior of fishery participants and the elements chosen by the Council. Shifts in fishing behavior are anticipated to be minimal, therefore changes in incidental take of marine mammals are not expected to have population level effects.

Given the very small population, any mortality or serious injury of North Pacific right whales incidental to commercial fisheries would be considered significant. Entanglement in fishing gear, including lobster pot and sink gillnet gear, is a significant source of mortality and serious injury for the North Atlantic right whale stock (Waring et al. 2004). There are no records of mortality or serious injury of Eastern North Pacific right whales in any U.S. fishery. Increases in the overlap of pot fisheries and right whale critical habitat would increase the likelihood of gear entanglement, but this potential exists even under Alternative 1, depending on fishing behavior. Given the information depicted in Figures 16 and 17, conversations with fishery participants of anticipated pot fishing ground, and the Area 4 IPHC closed area which partially overlaps with the Bering Sea Critical Habitat Area, we do not predict an increase in fishing activity in right whale critical habitat. Overall, given the remote nature of the known and likely habitats of North Pacific right whales discussed in section 3.8.1.2, it is very unlikely that any mortality in this population would be observed.

The BSAI currently does not have limits on the number of pots a vessel can set, nor is there a requirement that they must be longline pots. Elements 1 and 2, gear retrieval and the allowed use of both single and longline pots, should be considered regarding their potential effects on marine mammals. The length of time gear is left on fishing grounds and the type of pots used (and therefore the number of lines in the water) could have differing effects on the likelihood of marine mammal entanglement. The more vertical lines there are in the water, the higher potential there is for entanglement. Reducing the number of buoy lines in the water column by adding more pots per line may reduce risks to protected species. However, the fishery is still classified as a Category III fishery. While there is no limit on the number of pots a vessel can set at a time, vessels are limited by space on board, weight, and safety issues. We would only expect to see an increased number of pots/lines in the water if more people shift to pot gear, and particularly if fishery participants decide to use single pots rather than longline pots. Any shift towards increased use of pots is likely to be minimal, particularly if the action remains incidental to the sablefish fishery. For these reasons, we do not expect significant effects on marine mammals from any changes to these requirements.

No information in this analysis suggests that a temporal or seasonal shift in sablefish IFQ fishing is expected to occur under Alternative 2. In fact, a return to traditional fishing patterns might be expected, as shifts in fishing patterns to avoid whales would be discontinued by those who switch to pot longline gear. If some portion of the HAL fleet switches to longline pots, there will likely be decreased interactions between killer whales and the HAL fishery. This action would likely lead to reduced likelihood of entanglement.

Prey Availability Effects

Alternative 2 would reduce the opportunity for whales to depredate on longlines or on halibut discarded from sablefish pots. There would be a decrease in the potential to modify marine mammal foraging behavior, and this previously non-existent source of prey would not be as easily accessible. This is unlikely to have population-level impacts and therefore does not constitute a significant effect on marine mammals. Additionally, it is unlikely that any shift from longline to pot gear would impact benthic habitat enough to decrease marine mammal prey base to the extent that it would impact survival rates or reproductive success.

Table 14 lists marine mammals that may depend on benthic prey and known depths of diving. Diving activity may be associated with foraging. The essential fish habitat (EFH) EIS states that little research has been conducted on the effect of longline pot gear on benthic habitat (NMFS 2005). The area of seafloor contacted by each pot during retrieval is unknown and is expected to depend on vessel operations, weather, and current. However, it is unlikely that the fishery would impact the benthic habitat enough to decrease marine mammal prey base to the extent that it would impact survival rates or reproductive success.

Disturbance Effects

Alternative 2 could reduce the likelihood of any measures being taken to deter or evade whale depredation, described in Section 3.8.2. Additionally, if fishing behavior changes so that more vessels use pots than HAL gear, we would potentially see decreased interactions between whales and HAL gear/associated vessels because retention of halibut in pots as well as increased use of pots would decrease depredation opportunities. Under Alternative 2, there is likely no change in the potential for disturbance of marine mammals.

While decreased prey availability under Alternative 2 may negatively impact killer whales in the short term because they must return to natural predatory behavior, it benefits their survival in the long term due to decreased opportunities for entanglements and other fishery interactions such as ship strikes. Overall, Alternative 2 is expected to result in no significant population-level impacts to marine mammals. As compared to the status quo, Alternative 2 would likely produce an incremental reduction in the likelihood of the negative effects of commercial fisheries on killer whales.

3.8.3.3 Cumulative Effects on Marine Mammals

Based on the preceding analysis, the impacts of this proposed action and alternatives on marine mammals are either non-existent or *de minimus*; therefore, there is no need to conduct an additional cumulative impact analysis.

3.9 Seabirds

3.9.1 Status

Alaska's waters support extremely large concentrations of seabirds. Over 80 million seabirds are estimated to occur in Alaska annually, including 40 million to 50 million individuals from the numerous species that breed in Alaska (Table 15; USFWS 2009). An additional 40 million to 50 million individuals do not breed in Alaska but spend part of their life cycle there. These include short-tailed and sooty shearwaters and three albatross species: the black-footed albatross, the Laysan albatross, and the endangered short-tailed albatross (Table 15; USFWS 2009).

As noted in the PSEIS (NMFS 2004), seabird life history includes low reproductive rates, low adult mortality rates, long life span, and delayed sexual maturity. These traits make seabird populations extremely sensitive to changes in adult survival and less sensitive to fluctuations in reproductive effort. The problem with attributing population changes to specific impacts is that, because seabirds are long-lived animals, it may take years or decades before relatively small changes in survival rates result in observable impacts on the breeding population.

Table 15 Seabird species in Alaska

Type	Common name	Status
Albatrosses	Black-footed	
	Short-tailed	Endangered
	Laysan	
Fulmars	Northern fulmar	
Shearwaters	Short-tailed	
	Sooty	
Storm petrels	Leach's	
	Fork-tailed	
	Pelagic	
	Red-faced	
	Double-crested	
Gulls	Glaucous-winged	
	Glaucous	
	Herring	
	Mew	
	Bonaparte's	
	Slaty-backed	
Murres	Common	
	Thick-billed	
Jaegers	Long-tailed	
	Parasitic	
	Pomarine	

Type	Common name	Status
Guillemots	Black	
	Pigeon	
Eiders	Common	
	King	
	Spectacled	Threatened
	Steller's	Threatened
Murrelets	Marbled	
	Kittlitz's	
	Ancient	
Kittiwakes	Black-legged	
	Red-legged	
Auklets	Cassin's	
	Parakeet	
	Least	
	Whiskered	
	Crested	
Terns	Arctic	
Puffins	Horned	
	Tufted	

More information on seabirds in Alaska's EEZ may be found in several NMFS, Council, and USFWS documents:

- The URL for the USFWS Migratory Bird Management program is at http://alaska.fws.gov/mbsp/mbm/index.htm.
- Section 3.7 of the PSEIS (NMFS 2004) provides background on seabirds in the action area and their interactions with the fisheries. This may be accessed at https://alaskafisheries.noaa.gov/sites/default/files/pseis0604-chpt_3_7.pdf.
- The annual Ecosystems Considerations chapter of the SAFE reports has a chapter on seabirds. Back issues of the Ecosystem SAFE reports may be accessed at http://www.afsc.noaa.gov/REFM/REEM/Assess/Default.htm.
- The Seabird Fishery Interaction Research webpage of the Alaska Fisheries Science Center: http://www.afsc.noaa.gov/REFM/REEM/Seabirds/Default.php.
- The NMFS Alaska Region's Seabird Incidental Take Reduction webpage: https://alaskafisheries.noaa.gov/pr/seabird-bycatch.
- The BSAI and GOA groundfish FMPs each contain an "Appendix I" dealing with marine mammal and seabird populations that interact with the fisheries. The FMPs may be accessed from the Council's home page at http://www.alaskafisheries.noaa.gov/npfmc/default.htm.
- Washington Sea Grant has several publications on seabird takes, and technologies and practices for reducing them: https://wsg.washington.edu/seabird-bycatch-prevention-in-fisheries/.

- The seabird component of the environment affected by the groundfish FMPs is described in detail in Section 3.7 of the PSEIS (NMFS 2004), and updated in the PSEIS Supplemental Information Report (NPFMC and NMFS 2015).
- Seabirds and fishery impacts are also described in Chapter 9 of the Alaska Groundfish Harvest Specifications EIS (NMFS 2007).
- USFWS. 2015. Biological Opinion for 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. Anchorage, AK: 52 pp. Document available at: https://alaskafisheries.noaa.gov/sites/default/files/analyses/usfws-biop-122315.pdf
- NMFS. 2015. 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*). Document available at: https://alaskafisheries.noaa.gov/sites/default/files/analyses/seabirdba0815.pdf
- Seabird Bycatch and Mitigation Efforts in Alaska Fisheries Summary Report: 2007 through 2015 (Eich et al. 2016).
- Seabird Bycatch Estimates for Alaska Groundfish Fisheries Annual Report: 2015 (Eich et al. 2017).

3.9.2 Effects on Seabirds

Incidental Take

Pot gear remains the gear type with the least amount of seabird bycatch (Table 16), representing an overall average of 2% of the total from 2007 through 2015 (range 0.4% to 4%). Seabird bycatch in the pot fishery occurs primarily in the Bering Sea and GOA with very little bycatch attributed to the Aleutian Islands. In 2015, 85% (215 birds) of the seabird bycatch attributed to pot gear was in the Bering Sea and 15% (39 birds) were attributed to the GOA. No birds were estimated to have been taken as bycatch by pot gear in the Aleutian Islands in 2015 (Eich et al. 2017).

Table 16 Estimated seabird bycatch for pot vessels fishing groundfish in Alaska Federal waters, all fishery management plan areas combined.

Species/Species Group	2007	2008	2009	2010	2011	2012	2013	2014	2015
Northern Fulmar	371	34	125	69	37	0	20	11	195
Shearwaters	0	0	5	0	0	0	57	0	0
Gulls	0	60	0	0	0	0	0	0	0
Auklets	0	0	0	0	0	0	0	35	58
Other Alcids	0	0	0	0	0	0	0	39	0
Unidentified Birds	0	0	0	0	0	20	0	0	0
Grand Total	**371**	**94**	**130**	**69**	**37**	**20**	**77**	**85**	**254**

Source: Eich, A.M., S.M. Fitzgerald, and J. Mondragon. 2017. Seabird Bycatch Estimates for Alaska Groundfish Fisheries Annual Report: 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/AKR-13, 30 p.

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 2003). No change to that determination has been made in subsequent biological opinions (USFWS 2015).

Only Northern fulmar, shearwaters, gulls, and various alcid species have been taken in this fishery. It is most likely that the surface and near-surface foragers (procellarids and gulls) are actually "captured" in pots as a result of collisions with pots during bad weather, as reported by several fisheries observers. Although 2015 had the highest amount of bycatch since 2007 for this gear type, pot-fishing does not represent a conservation concern for Alaska seabirds.

Prey Availability

The status quo groundfish fisheries do not harvest seabird prey species in an amount that would decrease food availability enough to impact survival rates or reproductive success. Under the Status Quo alternative no substantive changes are expected, and impacts are expected to be negligible.

3.9.2.1 Alternative 1

Incidental Take

The current prohibition of the retention of halibut in pot gear is the status quo, or No Action, alternative. Alternative 1 would not introduce new gear or participants into the sablefish pot fishery and therefore have an insignificant impact on seabirds.

The effects of the status quo fisheries on incidental take of seabirds are described in PSEIS (NMFS 2004), which concluded that these fisheries are not likely to result in significantly adverse impacts to seabirds. It is reasonable to conclude that incidental take of seabirds would not change under the Status Quo alternative.

Prey Availability

Alternative 1 would not introduce new gear or participants into the sablefish pot fishery and therefore have an insignificant impact on seabird prey availability. Again, changes are not expected to be substantial, and any impacts are expected to be negligible.

3.9.2.2 Alternative 2

Incidental Take

Alternative 2 could introduce retention of halibut when pot fishing and has the potential to increase vessel participation. Pot gear has the lowest bycatch rates and it is assumed that the impact to seabirds is insignificant. Under increased retention of halibut in this scenario, there could be more fishing activity and potentially more incidental takes of seabirds which may be small compared to the reduction in seabirds that might occur from less HAL effort. However, pot gear has the lowest incidence of seabird incidental catch of all gear types. Overall effects on seabird takes are not likely to change substantially, and impacts are expected to be negligible.

Prey Availability

Alternative 2 introduces retention of halibut when pot fishing and has the potential to increase vessel participation. However, the impact to seabird prey availability is not expected to be significant. Again, changes are not expected to be substantial, and any impacts are expected to be negligible.

3.9.3 Cumulative Effects on Seabirds

Reasonably foreseeable future actions for seabirds include ecosystem-sensitive management; rationalization; traditional management tools; actions by other federal, state, and international agencies; and private actions, as described in Sections 8.4 and 9.3 of the Harvest Specifications EIS (NMFS 2007a). Ecosystem-sensitive management, rationalization, and traditional management tools are likely to increase

protection to seabirds by considering these species more in management decisions, and by improving the management of the non-pollock trawl fisheries through the restructured Observer Program, catch accounting, seabird avoidance measures, and vessel monitoring systems (VMS). Changes in the status of species listed under the ESA, the addition of new listed species or critical habitat, and results of future Section 7 consultations may require modifications to groundfish fishing practices to reduce the impacts of these fisheries on listed species and critical habitat. Additionally, since future TACs will be set with existing or enhanced protection measures, we expect that the effects of the fishery on the harvest of prey species and disturbance will not increase in future years.

Any action by other entities that may impact seabirds will likely be offset by additional protective measures for the federal fisheries to ensure ESA-listed seabirds are not likely to experience jeopardy or adverse modification of critical habitat. Direct mortality by subsistence harvest is likely to continue, but these harvests are tracked and considered in the assessment of seabirds. The cumulative effect of these impacts in combination with measures proposed under Alternative 2 is not likely to be significant.

Considering the direct and indirect impacts of the proposed action when added to the impacts of past and present actions previously analyzed in other documents that are incorporated by reference and the impacts of the reasonably foreseeable future actions listed above, the cumulative impacts of the proposed action are determined to be not significant.

4 Regulatory Impact Review

This Regulatory Impact Review (RIR) examines the benefits and costs of a proposed regulatory amendment to allow retention of legal-size halibut in pot gear used to fish sablefish IFQ and CDQ in the BSAI, provided the IFQ/CDQ holder also holds sufficient halibut IFQ/CDQ for that IPHC regulatory area. Acronyms

The preparation of an RIR is required under Presidential Executive Order (E.O.) 12866 (58 FR 51735, October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following Statement from the E.O.:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and Benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

4.1 Statutory Authority

Any action to allow halibut retention during the BSAI sablefish IFQ fishery involves the Council, NMFS, and the IPHC. The Pacific halibut fishery off Alaska is managed by the NMFS under the authority of the Northern Pacific Halibut Act of 1982, and in coordination with annual fishery management measures adopted by the IPHC under the Convention between the United States and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea. The IPHC develops regulations governing the Pacific halibut fishery under the Convention, which are promulgated domestically by NMFS. Additional regulations that are not in conflict with approved IPHC regulations may be recommended by the Council. Council action must be approved and implemented by the Secretary of Commerce (Secretary).

The groundfish fisheries in the U.S. exclusive economic zone of the BSAI, including the sablefish fishery, are managed by NMFS under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Under the authority of the MSA, the Council developed the Fishery

Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area and is authorized to prepare and submit to the Secretary for approval any necessary amendments to the BSAI FMP. Regulations implementing the BSAI FMP and general regulations governing groundfish are implemented by NMFS after Council review and Secretarial approval. Therefore, coordination between the IPHC, the Council, and NMFS is crucial when considering complementary regulatory amendments.

The Alaska Department of Fish and Game (ADF&G) has one primary regulation pertaining to commercial take of halibut: halibut may not be taken or possessed for commercial use in a way that is inconsistent with IPHC regulations. As long as the Council and NMFS coordinate to ensure that Federal-waters regulations are in line with IPHC regulation, then state-waters rules would also be aligned. ADF&G accomplishes this by adopting Federal rules through a global emergency order. For vessels fishing IFQ, neither a NMFS regulatory amendment to allow incidental halibut retention in BSAI sablefish pots, nor a coordinated NMFS/IPHC package to allow the targeting of BSAI halibut with pots would require complementary action on the part of ADF&G. Verification that a vessel possesses the necessary halibut IFQ for the fish it retains would occur through the normal channels.[33]

4.2 Purpose and Need for Action

The Council adopted the following problem statement to originate this action in October 2017.

> *Interactions with whales throughout the Bering Sea and Aleutian Islands affect the ability of sablefish and halibut quota share holders to harvest their IFQ by reducing catch per unit of effort and increasing fishing costs. Whale depredation on discarded halibut is increasing for vessels using pot gear in the sablefish IFQ fishery and vessels fishing halibut IFQ with longline gear in the BSAI. Research into developing technological solutions to deter whales and changes in fishing strategies has not resolved the problem. The problem may be addressed by revisions to current regulations that authorize pot gear as legal gear for retention of halibut in the BSAI. Allowing retention of halibut caught in pot gear in the BSAI could address the negative impacts of whale interactions on sablefish and halibut quota share holders by reducing the amount of halibut lost to whale depredation. The Council seeks to reduce the problems associated with whale depredation while minimizing gear conflicts. The Council seeks to reduce the amount of unaccounted mortality occurring due to whale depredation.*

4.3 Alternatives

The alternatives in this chapter were designed to accomplish the stated purpose and need for the action. The action alternative was designed to allow for more efficient harvest of the halibut resource by decreasing the wastage of legal-sized halibut discarded in the BSAI sablefish pot fishery. This action is also intended to allow for the possibility of reduced whale depredation of halibut off of hook-and-line gear, by allowing operators that hold both halibut and sablefish IFQ/CDQ the opportunity to retain halibut in pot gear.

The Council adopted the following alternatives for analysis in October 2017.

[33] Since IFQ are specific to a regulatory area and vessel size category, the amount of halibut retained and landed is crosschecked against the IFQ permit database to verify that the permit holder's IFQ balance is sufficient for the relevant area and vessel size category. In addition, OLE can reference information in NMFS and IPHC logbooks at the time of landing.

Alternative 1: No action

Alternative 2: Allow retention of legal-sized halibut in pot gear used to fish sablefish IFQ[34] in the BSAI, provided the IFQ holder also holds sufficient halibut IFQ for that IPHC regulatory area.

Element 1: Applies to both single pots and longline pots

Element 2: Gear retrieval

Option 1: No gear tending requirements (status quo)

Option 2: A vessel with unfished sablefish IFQ onboard cannot leave gear on the grounds untended for more than (sub-options 5-10 days)

Element 3: Limit of 9-inch maximum width of tunnel opening does not apply when vessel has unfished halibut IFQ onboard

Element 4: All vessels using pot gear to fish IFQ are required to use logbooks and VMS

NMFS will include pot gear effort and catch of IFQ species in its annual management report to the Council. The Council intends to review the effects of allowing retention of halibut in pot gear three years after implementation.

4.4 Methodology for analysis of impacts

This analysis was prepared using a combination of qualitative and quantitative sources. Qualitative data on harvest, harvesting vessels, and value is obtained from Alaska Department of Fish and Game (ADF&G)/ Commercial Fisheries Entry Commission (CFEC) fish tickets sourced through AKFIN using the Comprehensive Fish Ticket database and NMFS catch accounting system. Information about halibut allocation, QS holders, and weekly landings is derived from data provided by NMFS Restricted Access Management (RAM) Program (primarily accessible at https://alaskafisheries.noaa.gov). This analysis relies on a number of references for both qualitative and quantitative background information as well, notably the IFQ Program 20-year review (NPFMC/NMFS 2016), the analysis for the authorization of pot gear for use in the sablefish IFQ fishery in GOA (NPFMC 2016), and the BSAI sablefish chapter of the SAFE (NPFMC 2017c). For a full list of references, see Section 7. Qualitative and anecdotal information was provided by a number of representatives in management and enforcement, as well as fishery participants and processor representatives, as listed in Section 6.

4.5 Description of Fisheries

This section provides some background information on the harvesting, harvesters, processors, markets, and the communities that could be related to the proposed action. This baseline information is intended to provide a relevant reference for the subsequent discussion of impacts resulting from the proposed action to allow halibut retention in sablefish IFQ/ CDQ pots.

[34] In October 2017 the Council stated its intent that this action would also apply to the CDQ fishery as well. The analyst will replace all "IFQ" with "IFQ and CDQ" unless Council indicates otherwise. Thus, the analysis includes both categories of quota.

4.5.1 Description of Management and Allocation

4.5.1.1 Halibut and Sablefish IFQ

In 1991, the Council recommended an IFQ Program for the management of the fixed gear halibut and sablefish fisheries off of Alaska (NPFMC & NMFS 1992). The Secretary of Commerce approved the Council's IFQ Program as a regulatory amendment in 1993, and the program was implemented by NMFS for the fishing season in 1995. The fundamental component of the IFQ Program is QS, issued to participants as a percentage of the QS pool for a species-specific IFQ regulatory area, which is translated into annual IFQ allocations in the form of fishable pounds.

There are also many reference that can provide more comprehensive and extensive background data on the IFQ Program.[35] This section highlights only the most relevant elements of the IFQ management system to this current action.

One central management component of the IFQ Program is the catch limit or **total allowable catch** (TAC) established for the IFQ fisheries. In both the halibut and the sablefish fisheries, TACs are established for discrete management areas. The IPHC determines the TACs for the halibut fishery under the authority of the Halibut Act. There are eight halibut IFQ regulatory areas (Figure 1) in Alaska, inclusive of Areas 2C through Area 4E, although all of the Area 4E TAC is allocated to the CDQ Program. For the sablefish IFQ fishery, the Secretary of Commerce determines the TAC available for the directed sablefish fishery, based on the recommendations of the Council. There are two Fishery Management Plan areas (Figure 1), BSAI and GOA. Management areas are further broken out into the Bering Sea and the Aleutian Islands. All halibut and sablefish QS have **regulatory area designations,** which specify the area in which the IFQ derived from those shares may be harvested.

Through an amendment to the IFQ Program, some **harvest flexibility** has been built into the use of Area 4C halibut QS. All or part of the QS and IFQ specified for regulatory area 4C may be harvested in either Area 4C or Area 4D. The IPHC considers Areas 4C, 4D, and 4E to be one halibut stock, so using Area 4C, 4D, or 4E IFQ across areas does not interfere with the biological management of the stock. The intent of allowing the harvest of Area 4C IFQ in Area 4D was to provide for increased harvesting opportunities for small boat halibut IFQ fishermen, in response to localized stock depletion around Area 4C.

In addition to area specifications, halibut and sablefish QS retain a **QS class designation**, which represent the size of vessel that is permitted to harvest that IFQ. There are four vessel classes in the halibut IFQ fishery (A through D) and three in the sablefish IFQ fishery (A through C). After several amendments to the original QS categories, the current vessel lengths associated with each QS class categories are depicted in Table 17.

Class A shares in both fisheries are designated for vessels of any size and also provide for the opportunity to process at sea on catcher-processors (i.e., for the directed sablefish and halibut fisheries, these constitute freezer longline vessels). In both fisheries, Class B shares are also able to be fished on any size vessel. Class C shares are designated to be fished on vessels equal to or less than 60 feet LOA. In the halibut fishery, Class D shares are designated to be fished on vessels less than or equal to 35 feet LOA

[35] For example, the IFQ Program Review presented at the October 2016 Council meeting provides a comprehensive assessment of the procession of the program, framed around the 10 objectives identified by the Council when it developed the program (NPFMC/NMFS 2016). Additionally, QS transfer data, disaggregated in many ways, can also be found in the NOAA Fisheries Alaska Region Restricted Access Management (RAM) Transfer Report (NMFS 2015a), and choice statistics about the fishery were provided in the RAM Report to the Fleet (NMFS 2014), which was produced annually up until 2012.

(with some exceptions). Class D vessels had not historically operated in the sablefish fishery, due to the fact that this fishery is primarily prosecuted in offshore and deeper waters. These vessel class designations were intended to maintain the diversity of the IFQ fleets, and the Council intended for the Class D QS to be the most likely entry-level opportunity.

Table 17 Vessel length associations by QS class category

IFQ Species	QS Class	Vessel Length Designation
Halibut	A	Any length (also allows for onboard processing)
	B	Any length
	C	≤ 60 feet
	D	≤ 35 feet (except in halibut Areas 3B, 4B, and 4C where Class D IFQ may be harvested on a vessel ≤ 60 feet)
Sablefish	A	Any length (also allows for onboard processing)
	B	Any length
	C	≤ 60 feet

In recent years, approximately 30% of vessels eligible to fish in the IFQ fishery participate in both the halibut and sablefish fisheries and approximately 40% of vessels fish in more than one management area. Sablefish and halibut IFQ seasons are typically set simultaneously to reduce waste and discards. The season dates have varied by several weeks since 1995, but the monthly pattern for both fisheries is has been from March to November.

4.5.1.2 Halibut and Sablefish CDQ

The large-scale commercial fisheries of the BSAI developed in the eastern Bering Sea without participation from rural western Alaska communities. These fisheries are capital-intensive and require large investments in vessels, infrastructure, processing capacity, and specialized gear. The Community Development Program (CDQ) was developed to redistribute some of the BSAI fisheries' economic benefits to communities adjacent to the Bering Sea, by allocating a portion of commercially important BSAI species, including pollock, Pacific cod, crab, halibut, and various groundfish, to such communities.

The CDQ Program is an economic development program associated with federally managed fisheries in the BSAI. NMFS, the State of Alaska, and the Western Alaska Community Development Association (WACDA) administer the CDQ Program. Its purpose, as specified in the MSA, is to provide western Alaska communities the opportunity to participate and invest in BSAI fisheries, to support economic development in western Alaska, to alleviate poverty and provide economic and social benefits for residents of western Alaska, and to achieve sustainable and diversified local economies in western Alaska.

In fitting with these goals, NMFS allocates a portion of the annual catch limits for a variety of commercially valuable marine species in the BSAI to the CDQ Program. The percentage of each annual BSAI catch limit allocated to the CDQ Program varies by both species and management area. These apportionments are, in turn, allocated among six different non-profit managing organizations representing different affiliations of communities (CDQ groups), as dictated under the MSA. Eligibility requirements for a community to participate in the western Alaska Community Development Program are identified in the MSA at section 305(i)(1)(D).

There are 65 coastal Alaska communities[36] currently eligible to participate in the CDQ Program, representing a population of 27,702 residents (U.S. Census 2010). The CDQ-qualifying communities have organized themselves into six non-profit groups, with between 1 and 20 communities in each group. The CDQ communities are geographically dispersed, extending from Atka, on the Aleutian chain, along the Bering Sea coast, to the village of Wales, near the Arctic Circle. The current CDQ groups include:

Aleutian Pribilof Island Community Development Association (APICDA)

Bristol Bay Economic Development Corporation (BBEDC)

Central Bering Sea Fishermen's Association (CBSFA)

Coastal Villages Region Fund (CVRF)

Norton Sound Economic Development Corporation (NSEDC)

Yukon Delta Fisheries Development Association (YDFDA)

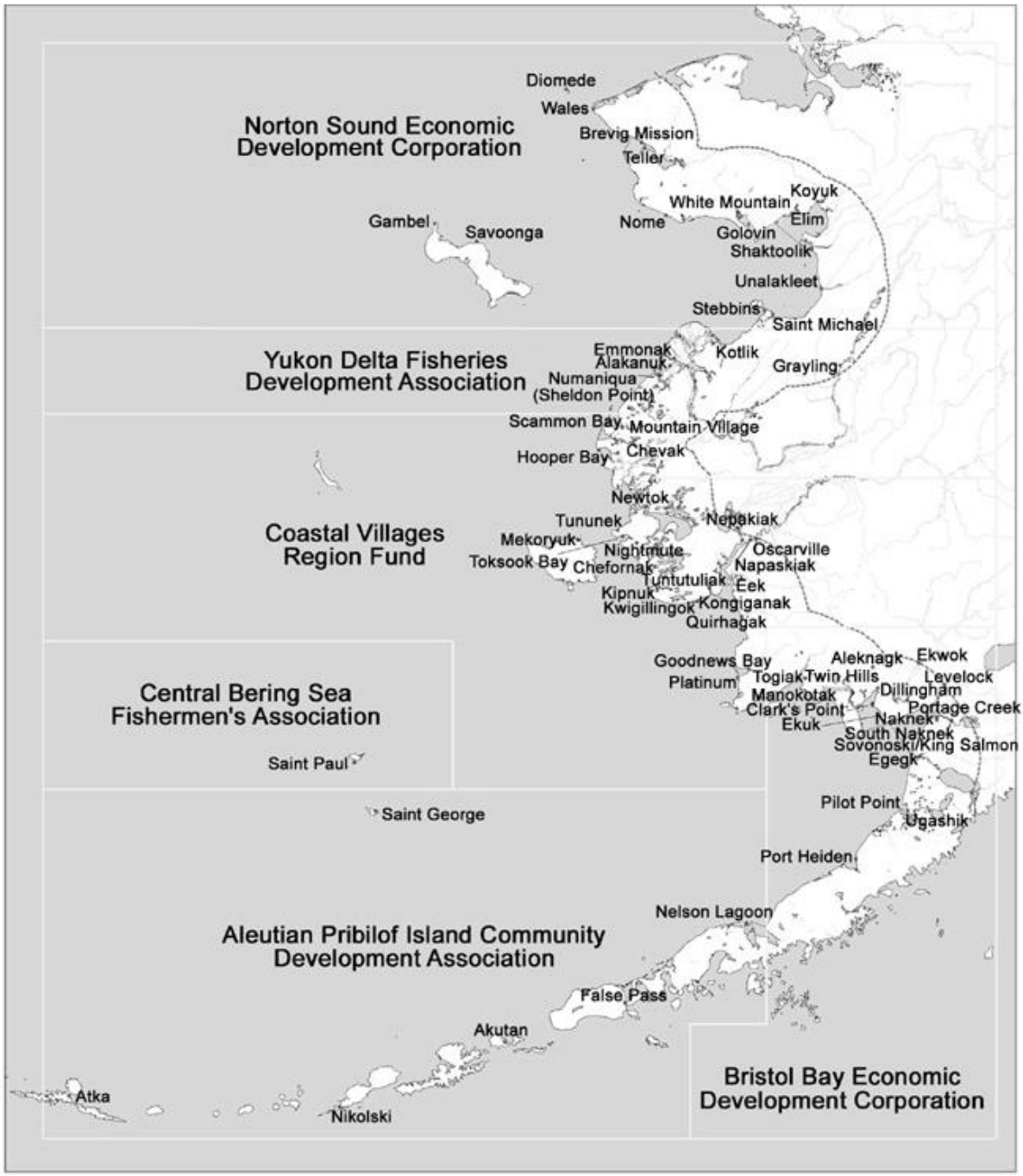
CDQ groups use the revenue derived from the harvest of their fisheries allocations as a basis for funding economic development activities and for providing employment opportunities. Therefore, the successful harvest of CDQ Program allocations is integral to achieving the goals of the program. Annual CDQ allocations provide a revenue stream for CDQ groups through various channels, including the direct catch and sale of some species, leasing quota to various harvesting partners, and income from a variety of investments.

One of the most tangible direct benefits of the CDQ Program has been employment opportunities for western Alaska community residents. CDQ groups have had some success in securing career track employment for many residents of qualifying communities and have opened opportunities for non-CDQ Alaskan residents as well. Jobs generated by the CDQ Program include work aboard a wide range of fishing vessels, internships with the business partners or with government agencies, employment at processing plants, and administrative positions. CDQ groups continue to explore the means to provide continuing and additional employment opportunities for local residents.

Figure 25 identifies the names and relative locations of the CDQ groups and the communities they represent.

[36] For a full list of the participating communities and the names of their associated group, see Table 7 in 50 CFR Part 679.

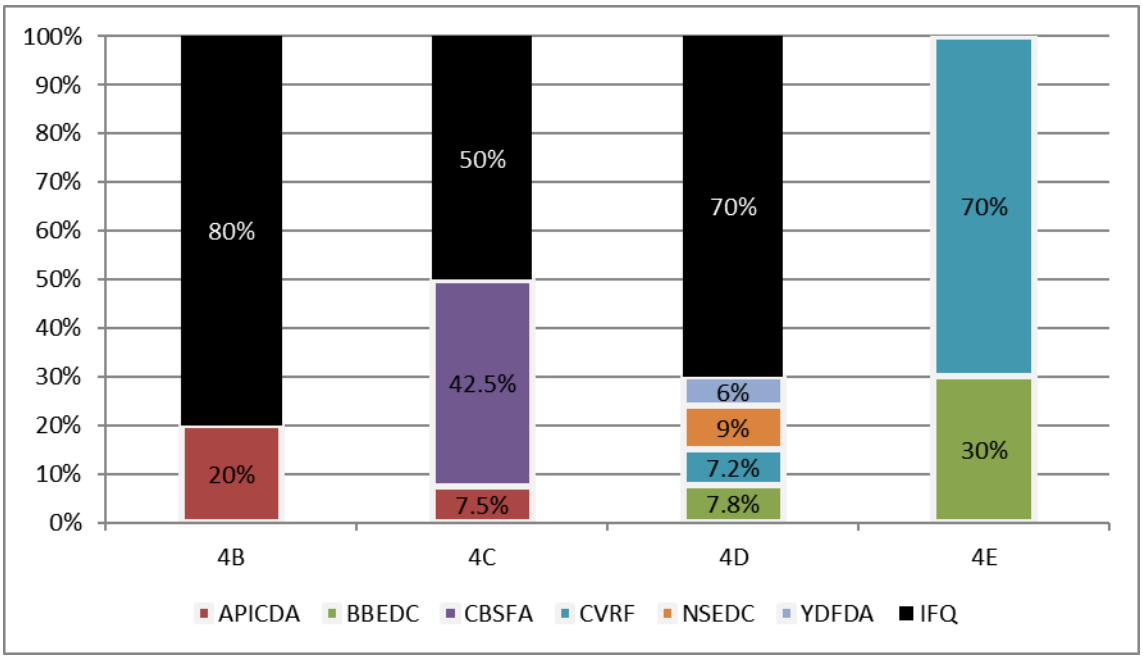
Figure 25 Western Alaska CDQ communities and groups



Source: NOAA, Alaska Fisheries Science Center

Among the species CDQ groups are allocated for commercial fishing, Pacific halibut is an important species for resident employment and income in many of the groups. Halibut is allocated to CDQ groups for commercial fisheries in four IPHC regulatory areas: 4B, 4C, 4D, and 4E (see Figure 26 and Table 18).

Figure 26 Halibut CDQ/ IFQ allocation in the regulatory Areas 4B, 4C, 4D and 4E



Source: 2016 CDQ program quota categories, target and non-target CDQ reserves, allocation percentages, and group quotas: https://alaskafisheries.noaa.gov/sites/default/files/reports/annualmatrix2016.pdf

Allocations of halibut quota are expected to provide CDQ groups real opportunities for small vessel fishing for their fleets, and, as such, area allocations of halibut CDQ are generally correlated with the location of the groups (refer to Figure 25 and Figure 26). For instance, Area 4B is located in the Aleutian Islands where the full CDQ allocation is held by APICDA. Area 4C surrounds the Pribilof Islands and the CDQ portion of the TAC is split 85% to St. Paul Island's CBSFA and 15% to APICDA, which includes St. George Island as a member. The CDQ portion of Area 4D is split 20% to YDFDA, 30% to NSEDC, 24% to CVRF, and 26% to BBEDC. Of the final Area 4E halibut CDQ, 70% is allocated to CVRF and 30% to BBEDC. Table 18 demonstrates the pounds that these percentages have represented over time (2010 through 2017).

Table 18 Annual halibut CDQ allocation by regulatory area (all units in net headed and gutted pounds), 2010 through 2017

Area	Year	TAC	Program Allocations	APICDA	BBEDC	CBSFA	CVRF	NSEDC	YDFDA
4B	2010	2,160,000	20%	432,000	0	0	0	0	0
	2011	2,180,000		436,000	0	0	0	0	0
	2012	1,869,000		373,800	0	0	0	0	0
	2013	1,450,000		290,000	0	0	0	0	0
	2014	1,140,000		228,000	0	0	0	0	0
	2015	1,140,000		228,000	0	0	0	0	0
	2016	1,140,000		228,000	0	0	0	0	0
	2017	1,140,000		228,000	0	0	0	0	0
4C	2010	1,625,000	50%	121,875	0	690,625	0	0	0
	2011	1,690,000		126,750	0	718,250	0	0	0
	2012	1,107,356		83,052	0	470,626	0	0	0
	2013	859,000		64,425	0	365,075	0	0	0
	2014	596,600		44,745	0	253,555	0	0	0
	2015	596,600		44,745	0	253,555	0	0	0
	2016	733,600		55,020	0	311,780	0	0	0
	2017	752,000		56,400	0	319,600	0	0	0
4D	2010	1,625,000	30%	0	126,750	0	117,000	146,250	97,500
	2011	1,690,000		0	131,820	0	121,680	152,100	101,400
	2012	1,107,356		0	86,374	0	79,730	99,662	66,441
	2013	859,000		0	67,002	0	61,848	77,310	51,540
	2014	596,600		0	46,535	0	42,955	53,694	35,796
	2015	596,600		0	46,535	0	42,955	53,694	35,796
	2016	733,600		0	57,221	0	52,819	66,024	44,016
	2017	752,000		0	58,656	0	54,144	67,680	45,120
4E	2010	330,000	100%	0	99,000	0	231,000	0	0
	2011	340,000		0	102,000	0	238,000	0	0
	2012	250,290		0	75,087	0	175,203	0	0
	2013	212,000		0	63,600	0	148,400	0	0
	2014	91,800		0	27,540	0	64,260	0	0
	2015	91,800		0	27,540	0	64,260	0	0
	2016	192,800		0	57,840	0	134,960	0	0
	2017	196,000		0	58,800	0	137,200	0	0
4CDE	2010	3,580,000		121,875	225,750	690,625	348,000	146,250	97,500
	2011	3,720,000		126,750	233,820	718,250	359,680	152,100	101,400
	2012	2,465,002		83,052	161,461	470,626	254,933	99,662	66,441
	2013	1,930,000		64,425	130,602	365,075	210,248	77,310	51,540
	2014	1,285,000		44,745	74,075	253,555	107,215	53,694	35,796
	2015	1,285,000		44,745	74,075	253,555	107,215	53,694	35,796
	2016	1,660,000		55,020	115,061	311,780	187,779	66,024	44,016
	2017	1,700,000		56,400	117,456	319,600	191,344	67,680	45,120

Source: CDQ program quota categories, target and non-target CDQ reserves, allocation percentages, and group quotas (2010 through 2017): https://alaskafisheries.noaa.gov/sites/default/files/reports/annualmatrix2016.pdf

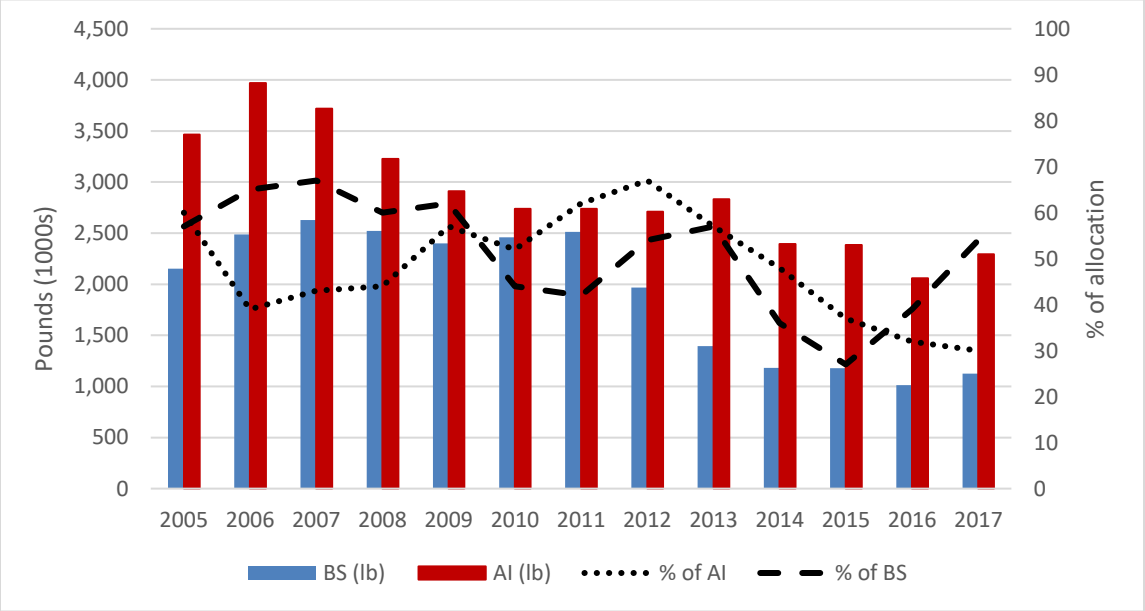
4.5.2 Sablefish IFQ/ CDQ Fishery

4.5.2.1 BSAI Harvest

The BS and AI sablefish allocations are the least fully harvested in the IFQ Program. Compared to the other IFQ regulatory areas, which typically harvest between 90 to 100% of their allocation (with the exception of Western Gulf, in some years), Figure 27 demonstrates a much lower harvest rate in the BS and AI. A low of only 30% of the AI sablefish IFQ was harvested in 2017. In 2015, the BS had a low of 27% of the total IFQ harvested. The most recent year when either area took more than half of its sablefish catch limit was 2013, when both areas landed 57% of their allocation. Neither area has caught over 67% of its allocation dating back to 2000, which is the earliest year available on NMFS's catch and landing report website.[37] This under-harvest is the result of many factors, chiefly the cost it takes to prosecute (financial as well as the opportunity cost), given the broad distribution of the stock and the remoteness of the region.

This figure also demonstrates that every year, a larger volume of sablefish IFQ is harvested in the Aleutian Islands, relative to the Bering Sea. However, in the last two years (2016 and 2017), a larger percentage of the sablefish IFQ allocation has been harvested in the Bering Sea.

Figure 27 Sablefish IFQ catch and percent catch relative to IFQ allocation, by sub-area (BSAI), 2005-2017



Source: http://alaskafisheries.noaa.gov/ram/ifqreports.htm

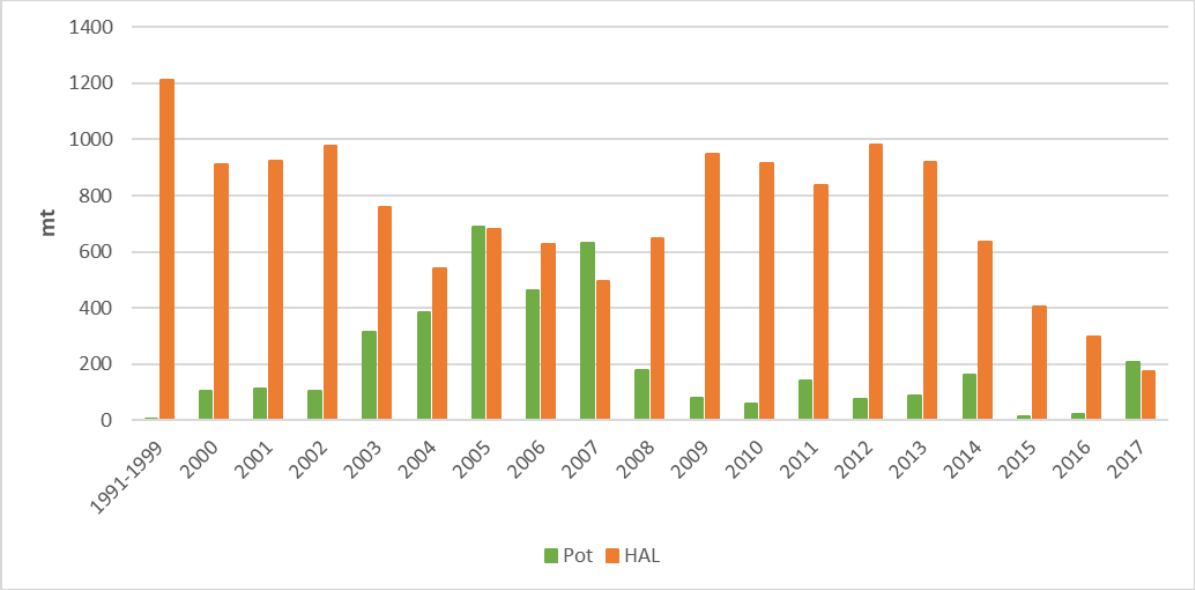
BSAI sablefish harvest data dating back to 1991 demonstrates a reliance on a mix of fishing gear types (Figure 28 and Figure 29). Hook-and-line gear (HAL) has typically been the prominent gear type prosecuting the sablefish fishery in the AI; however, there have been some years of increased reliance on pot gear (2003 through 2007). In 2007, pot gear harvest of AI sablefish represented 56% of the total fixed gear harvest. Most recently, in 2017, pot gear harvested 54% of the sablefish in the AI. However, overall harvest of sablefish in AI using fixed gear has dropped, particularly in the last 5 years, harvesting a total of 385 mt in 2017.

[37] https://alaskafisheries.noaa.gov/fisheries-catch-landings

Overall harvest of sablefish using fixed gear has typically been less in the BS compared to the AI, although some years are expectations (2008 and 2017). Compared to the AI, pot gear has been much more pervasive in the BS. From the 1990s to 2017, sablefish harvest with pot gear in the BS has experienced an increasing and then decreasing trend. The use of pot gear in the BS peaked in 2007 with 81% of the total fixed gear catch harvested with pots. In 2017, relative use of pots compared to HAL gear rose again, with 78% of the BS fixed gear harvest caught in pot gear.

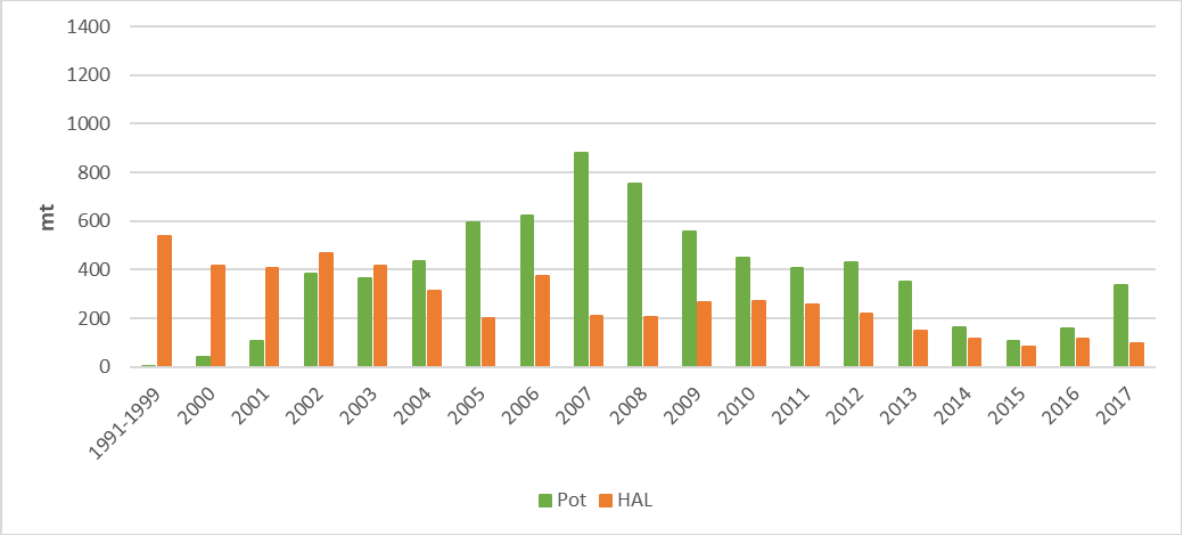
Note that Section 4.5.2.2 demonstrates that there are substantially more HAL vessels that have participated in the sablefish IFQ or CDQ fishery in the BSAI compared to vessels using pot gear. The overall percentage of sablefish harvested with pot gear (particularly in years with high rates of sablefish harvested in pots) means that these few vessels are responsible for a large amount of harvest. If even one of these vessels chooses not to participate it can contribute large variability in gear trends.

Figure 28 Sablefish catch in the Aleutian Islands by gear type, including CDQ and non-CDQ, 1991-2017



Source: Assessment of Sablefish stock in Alaska (NPFMC 2017c)
Notes: Catches from 1991-1999 are averages. Catch as of October 1, 2017.

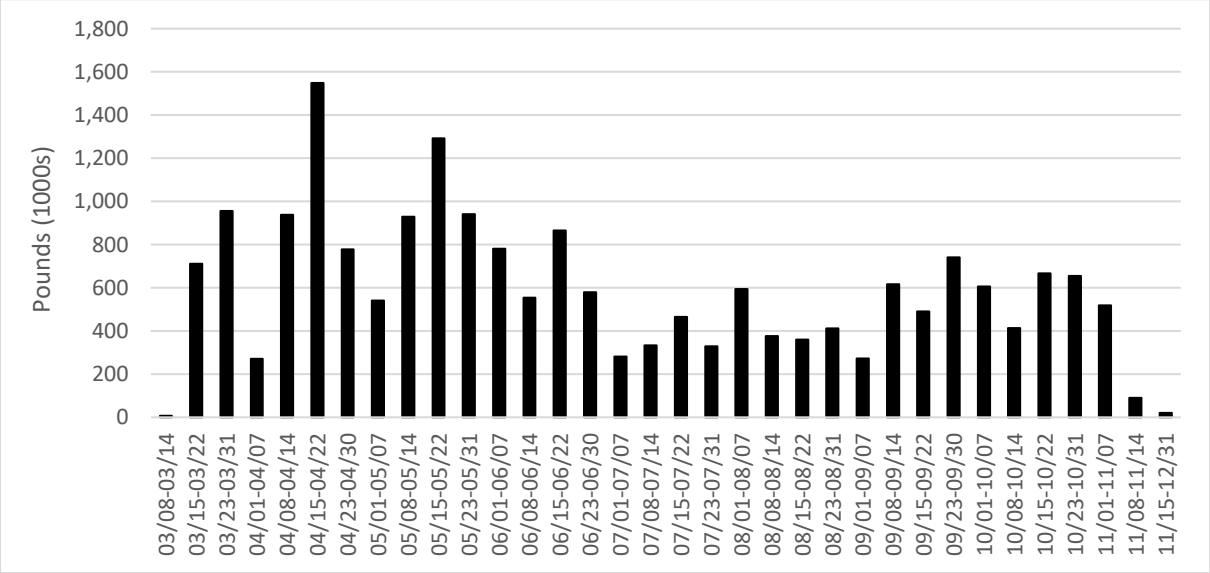
Figure 29 Sablefish catch in the Bering Sea by gear type, including CDQ and non-CDQ, 1991-2017



Source: Assessment of Sablefish stock in Alaska (NPFMC 2017c)
Notes: Catches from 1991-1999 are averages. Catch as of October 1, 2017.

Sablefish IFQ seasons are typical set simultaneously with the halibut season to reduce waste and discards. The halibut season is set by the IPHC and published in the annual regulations under the authority of the Halibut Act. As demonstrated in Figure 30, the greatest volume of sablefish landings occurs in April and May.

Figure 30 Weekly sablefish IFQ landings, 2017



Source: https://alaskafisheries.noaa.gov/sites/default/files/reports/17ifqsweekly.htm
Notes: Includes both BSAI and GOA

4.5.2.2 BSAI Harvesters

Table 19 and Table 20 captures all vessels that participated in the BSAI sablefish IFQ and/ or CDQ fisheries using fixed gear during the 2011 through 2016 period. Table 19 demonstrates the relative scale of fisheries. It splits up the vessel count by sector catcher processor (CP) or catcher vessel (CV). For both

pot vessels and HAL vessels, the majority of participating vessels are CV, but both gear types having included some participating CPs. There are 11 unique vessels that have fished BSAI sablefish IFQ or CDQ with pot gear from 2011 to 2016. All the vessels that fished sablefish CDQ with pot gear also fished sablefish IFQ with pot gear during that time period. There are 102 unique vessels that participated in the sablefish IFQ fishery using HAL gear during this time period.

Table 20 demonstrates the participating vessels by length overall (LOA). This table demonstrates that almost all vessels participating in the BSAI sablefish pot fishery are greater than or equal to 60 ft LOA. The only one vessel participating in the BSAI sablefish pot fishery between 2011 and 2016 that was less than 60 ft LOA, at least 50 ft LOA. This tables uses 60 ft LOA as a cut off because vessels 60 ft LOA or greater using fixed gear to harvest sablefish or halibut IFQ must maintain a daily fishing logbook (DFL), as explained in Section 4.7.6.3. Smaller vessels, less than 50 LOA may not have the space required to storage sablefish pot gear and may present safety concerns, particularly in the BSAI.

Table 19 Count of vessels that fished BSAI sablefish IFQ/ CDQ, by gear type and sector, 2011-2016

Sector	Year	Pot gear		HAL gear	
		BSAI sablefish (IFQ)	BSAI sablefish (CDQ)	BSAI sablefish (IFQ)	BSAI sablefish (CDQ)
CP	2011	2		10	3
	2012	1	1	12	1
	2013			7	3
	2014			8	2
	2015			7	
	2016			8	3
CV	2011	7	3	52	7
	2012	4	2	42	5
	2013	4	3	38	4
	2014	4	2	36	6
	2015	3	2	38	3
	2016	4	2	36	9
Total unique vessels		11	6	97	26
Total unique vessels between IFQ and CDQ		11		102	

Source: ADF&G/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Table 20 Count of vessels that fished BSAI sablefish IFQ/ CDQ, by gear type and LOA, 2011-2016

Year	LOA category	Pot gear		HAL gear	
		BSAI sablefish (IFQ)	BSAI sablefish (CDQ)	BSAI sablefish (IFQ)	BSAI sablefish (CDQ)
2011	<50ft			10	
	≥ 50ft and < 60ft			28	4
	≥ 60ft	9	3	24	6
2012	<50ft			7	
	≥ 50ft and < 60ft			20	4
	≥ 60ft	5	3	27	2
2013	<50ft			6	
	≥ 50ft and < 60ft			20	3
	≥ 60ft	4	3	19	4
2014	<50ft			10	1
	≥ 50ft and < 60ft			16	4
	≥ 60ft	4	2	18	3
2015	<50ft			7	
	≥ 50ft and < 60ft	1	1	20	3
	≥ 60ft	2	1	18	
2016	<50ft			8	3
	≥ 50ft and < 60ft			18	5
	≥ 60ft	4	2	18	4

Source: ADF&G/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

For purposes of comparing the relative scale of the fisheries and the size of the participating vessels, Table 21 presents counts of vessels in the BSAI Pacific cod fixed gear fisheries, including the State of Alaska BSAI Guideline Harvest Level (GHL) Pacific cod fishery, by LOA. The BSAI Pacific cod pot fishery in particular includes more participating vessels than the BSAI sablefish pot fishery. Between 2011 and 2016 there were 88 unique vessels in the BSAI Pacific cod pot fishery, and 59 unique vessels in the BSAI Pacific cod fishery using HAL gear. The majority of these vessels, particularly for the pot fishery, are greater than or equal to 50 ft LOA. As later discussed in Section 4.7.1, these vessels may be equipped to deploy pot gear safely in the BSAI; however, the participants onboard would also need to hold both halibut and sablefish quota in order to participate in the proposed action.

Table 21 Count of vessels that fished BSAI Pacific cod, by gear type and LOA, 2011-2016

Year	LOA category	Pot gear	HAL gear
2011	<50ft		3
	≥ 50ft and < 60ft	15	7
	≥ 60ft	37	30
2012	<50ft	2	6
	≥ 50ft and < 60ft	18	4
	≥ 60ft	34	29
2013	<50ft	2	10
	≥ 50ft and < 60ft	23	5
	≥ 60ft	34	29
2014	<50ft		5
	≥ 50ft and < 60ft	20	3
	≥ 60ft	35	28
2015	<50ft	1	4
	≥ 50ft and < 60ft	21	3
	≥ 60ft	27	28
2016	<50ft	1	1
	≥ 50ft and < 60ft	27	1
	≥ 60ft	28	28

Source: ADF&G/CFEF Fish Tickets, data compiled by AKFIN in Comprehensive_FT

To understand more about the small pool of vessels that have participated in the BSAI sablefish IFQ fishery using pot gear in the recent past, Table 22 demonstrates the diversification in other fisheries. Note that value or volume of landings in other fisheries could not be presented in a meaningful way due to the small sample size of vessel and confidential data; however, Table 22 captures vessel counts. For example, of the four vessels that participated in the BSAI sablefish IFQ fishery using pot gear in 2016, two of them also fished sablefish CDQ with pot gear, one fished sablefish IFQ with HAL gear, all four fished halibut IFQ with HAL gear, and one participated in the Pacific cod pot fishery. None of these vessels participated in the sablefish or halibut CDQ fisheries with HAL gear in 2016. In general, this table demonstrates the most overlap with the sablefish CDQ pot fishery and the BSAI halibut IFQ HAL fishery.

Table 22 Diversification of vessels that participated in the BSAI sablefish IFQ fishery using pot gear

Year	Count of vessels in the BSAI sablefish IFQ fishery using pot fishery	Of the vessel that fished BSAI sablefish IFQ with pot gear, number of vessels that also fished BSAI…					
		Sablefish with pot gear (CDQ)	Sablefish with HAL gear (IFQ)	Sablefish with HAL gear (CDQ)	Halibut with HAL gear (IFQ)	Halibut with HAL gear (CDQ)	Pcod with pot gear
2011	9	3	3	0	4	3	3
2012	5	3	3	0	3	1	2
2013	4	3	0	0	0	1	1
2014	4	2	0	0	1	0	1
2015	3	2	0	0	2	1	0
2016	4	2	1	0	4	0	1

Source: ADF&G/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Another way to think about diversification and access to a portfolio of fisheries is by the overlap in QS holdings by an individual QS holder. Table 23 demonstrates the overlap in the sablefish QS by regulatory area. For example, of the 84 sablefish QS holders who hold AI sablefish QS, 35 of them also hold sablefish QS in the WG. These types of connections may be important as Amendment 101 recently permitted pot gear as an authorized gear type for the harvest of sablefish IFQ in GOA, as well as retention of halibut in sablefish pot gear. This new gear type in GOA may affect the number of vessels participating in the BSAI sablefish pot fishery, if QS holders with sablefish QS in both the BSAI and GOA reconfigure their vessel to fish with pot gear in both areas.

Table 23 Overlap in QS holders regulatory areas, as of 2/23/18

	AI	BS	CG	SE	WG	WY	Total Unique
AI	84	37	34	17	35	26	
BS		93	37	18	36	28	
CG			339	76	81	138	
SE				347	30	93	
WG					140	50	
WY						210	
Total Unique							771

Source: NMFS RAM, QS holders

4.5.2.3 The GOA Sablefish Pot Fishery in 2017[38]

In 2017, 277 catcher vessels fished GOA IFQ sablefish, 245 using only HAL gear (7,364mt), 5 using only pot gear (240mt), and 17 using both (889mt; with 238mt from HAL gear and 652mt from pot gear). In 2017, there were no CPs that participated in sablefish pot fishing in GOA. Table 24 demonstrates GOA sablefish IFQ landings by pot gear GOA sub-area.

[38] This section provides an updated version of the NMFS letter to the IFQ committee: http://npfmc.legistar.com/gateway.aspx?M=F&ID=cebf7f73-10e9-4006-b483-271550d39365.pdf

Table 24 GOA sablefish IFQ pot effort in 2017, as of 2/22/18

Area	# of vessels	sablefish (mt)
610	6	225.9
620	17	396.1
630	3	40.4
640	10	92.2
650	10	137.2
Total	22	891.7

Source: NMFS Catch Accounting, sourced through AKFIN

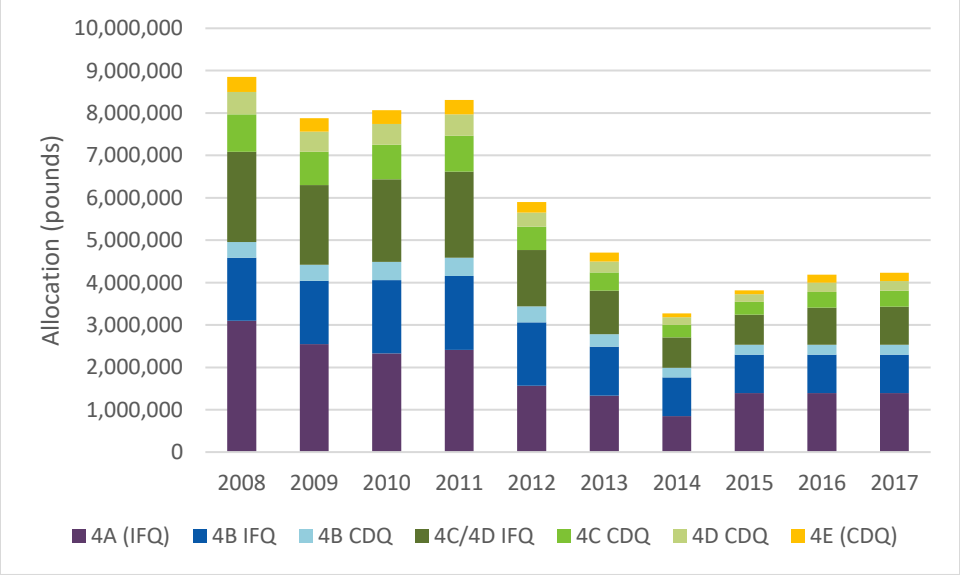
Of the 22 vessels that reported harvest of sablefish in pot gear, 14 of the vessels retained halibut, totaling 18.6mt of halibut. By vessel, their retention ranged from 0.2% to 43.3% of the sablefish catch by weight, or 3% overall for vessels that reported both sablefish and halibut.

4.5.3 Halibut IFQ/ CDQ Fishery

4.5.3.1 Area 4 Harvest

As described in Section 3.5.5, halibut in Area 4 are harvested with HAL longlines. Figure 32 shows the commercial catch limits recommended by the IPHC and quotas implemented by NMFS in each regulatory area from 2008 through 2017. Significantly less (over 3x less) halibut quota is apportioned in Area 4 than in Area 2C and 3 (Table 25). Total Area 4 halibut catch limits are generally over 90% harvested, with the lowest percent harvested since 2004 at 88.4% in 2013 (Figure 32). The percent harvested in Area 4 does not vary significantly across sub-areas (Figure 33).

Figure 31 Halibut IFQ & CDQ allocations by year, 2008-2017



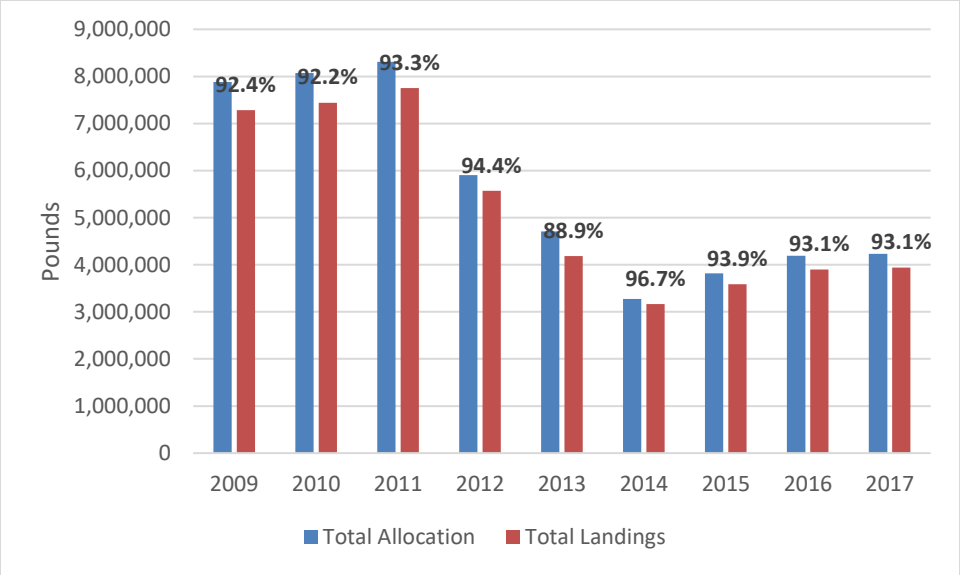
Source: NMFS RAM program
Note: 4A quota is all allocated as IFQ, 4E is all allocated as CDQ.

Table 25 Halibut IFQ/CDQ (combined) allocations in Areas 2C & 3 versus Area 4 in millions of pounds, 2008-2017.

Year	Area 2C & 3	Area 4
2008	41.3	8.9
2009	37.6	7.9
2010	34.3	8.1
2011	23.9	8.3
2012	19.6	5.9
2013	18.3	4.7
2014	13.5	3.3
2015	14.1	3.8
2016	14.0	4.2
2017	15.1	4.2

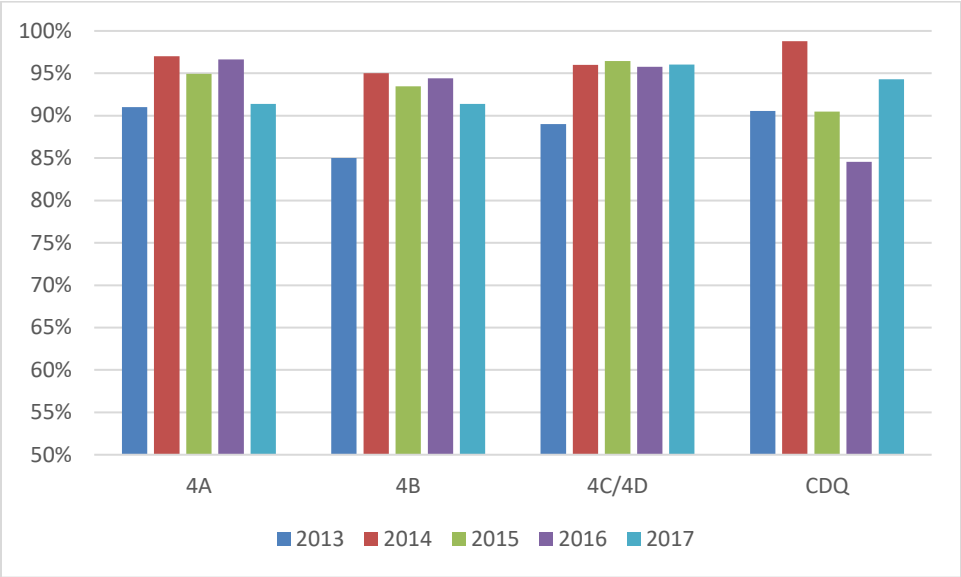
Source: IPHC Pacific Halibut Regulations 2008-2017
Note: Area 2C and 3 do not line up with GOA and Area 4 does not line up with BSAI because area 4A is split.

Figure 32 Commercial halibut catch limits and amount harvested in Area 4, 2004-2017



Source: NMFS Alaska Region (RAM) division IFQ landings database sourced through AKFIN
Note: Includes both IFQ and CDQ

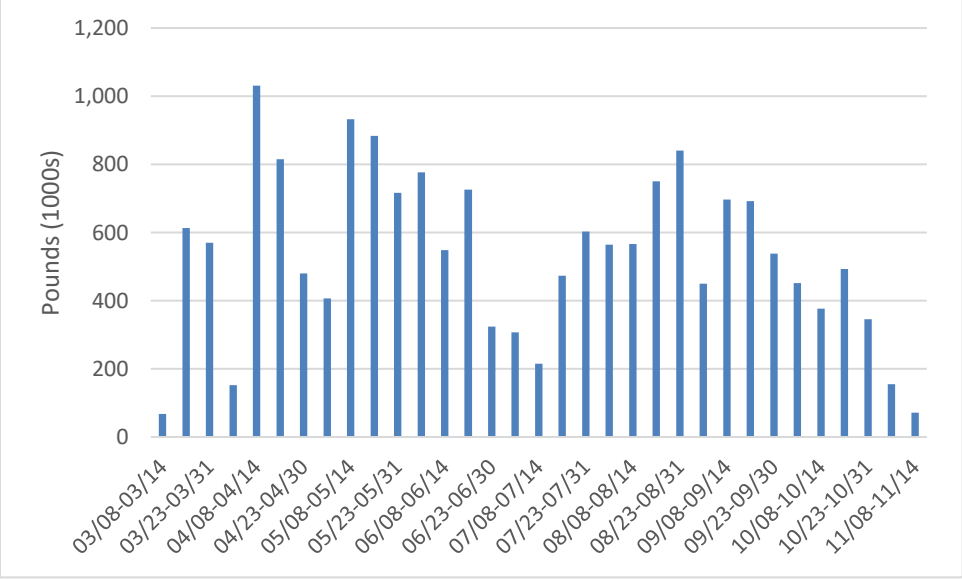
Figure 33 Percent of commercial halibut catch limits harvested in Area 4, 2013-2017



Source: NMFS Alaska Region (RAM) division IFQ landings database sourced through AKFIN

Halibut IFQ season is set by the IPHC and published in the annual regulations under the authority of the Halibut Act. As shown in Figure 34, the greatest volume of landings in April and May. The temporal distribution of these landings is bimodal, with a decrease in halibut harvest around July. This is likely due to the overlap with salmon season and is particularly influenced by the large GOA salmon fishery.

Figure 34 Weekly halibut IFQ landings, 2017

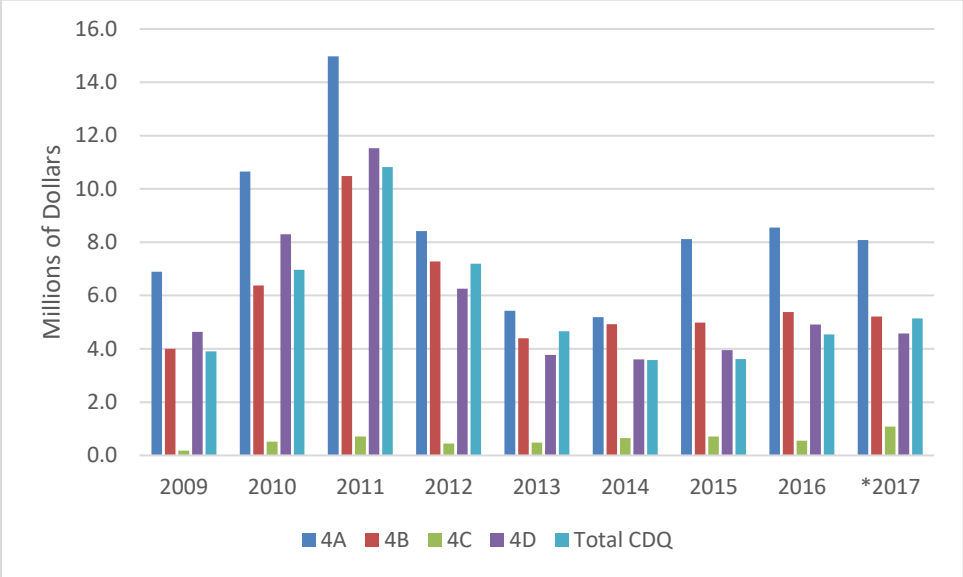


Source: https://alaskafisheries.noaa.gov/sites/default/files/reports/17ifqhweekly.htm
Notes: Weights are reported in net (headed and gutted) pounds. This report summarizes fixed gear IFQ landings reported by Registered Buyers. At sea discards are not included. Dates reflect dates that IFQ landings were reported, not necessarily when fish were harvested. Data are derived from initial data entry procedures and are preliminary. Future review and editing may result in minor changes. Dates without landings do not appear in the table. This table includes landings in both the GOA and BSAI

Bycatch in the halibut fishery is described in Section 3.7. Primary non-halibut species caught in HAL gear include skates, Pacific cod, sablefish, sculpins, several types of rockfish, arrowtooth/Kamchatka flounder, giant grenadier, and sea stars (Table 7, Table 9). The fishery also has some crab PSC (primarily golden king crab, but also *C. bairdi*, red and blue king crab, Table 10). Bycatch of halibut in other fisheries is significantly higher than regulatory discards of halibut in the commercial halibut fishery (Figure 12). Almost half of all halibut mortality in Area 4A is associated with bycatch in non-halibut fisheries.

Figure 35 shows ex-vessel value of IFQ halibut by regulatory area. In total in Area 4, halibut ex-vessel value. Area 4A continuously has the highest ex-vessel value, and 4C the lowest. Using 2009-2017 data, CDQ halibut has received less per pound than IFQ halibut. On average, CDQ halibut has been valued at $4.31/lb, while Area 4 IFQ halibut has been valued at $5.42/lb. The tiered price structure of halibut is discussed further in Section 4.5.4.

Figure 35 Ex-Vessel Value of IFQ halibut by area



Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive FT. *2017 estimated based off 2016 prices. 4E not included due to confidentiality.

4.5.3.2 Area 4 Harvesters

Fifty individuals currently hold both Area 4 halibut IFQ and Bering Sea sablefish IFQ, and 46 individuals currently hold both Area 4 halibut IFQ and Aleutian Islands sablefish IFQ (Table 27). It is possible that there is also overlap in many of these vessels.

Table 26 Number of Area 4 Halibut IFQ holders by vessel LOA

Year	LOA category	HAL gear	
		BSAI halibut (IFQ)	BSAI halibut (CDQ)
2011	<50ft	42	228
	≥ 50ft and < 60ft	40	8
	≥ 60ft	41	19
2012	<50ft	38	228
	≥ 50ft and < 60ft	36	10
	≥ 60ft	33	16
2013	<50ft	33	236
	≥ 50ft and < 60ft	35	8
	≥ 60ft	31	19
2014	<50ft	39	89
	≥ 50ft and < 60ft	27	6
	≥ 60ft	28	18
2015	<50ft	34	56
	≥ 50ft and < 60ft	29	9
	≥ 60ft	26	18
2016	<50ft	31	57
	≥ 50ft and < 60ft	30	8
	≥ 60ft	25	13

Source: ADF&G/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

Table 27 Overlap in QS holder regulatory areas. AI & BS are sablefish IFQ, Area 4 is halibut IFQ. CDQ not included.

	AI	BS	Area 4A	Area 4B	Area 4C	Area 4D	Any Area 4
AI	84	37	30	31	14	17	46
BS		93	39	17	15	17	50
Area 4A			172	34	15	26	
Area 4B				80	10	18	
Area 4C					49	22	
Area 4D						43	
Any Area 4							252

Source:

4.5.4 Communities, Processors, and Tax Revenue

This section provides some relevant background information on communities, processors, and tax revenue associated with the Area 4 halibut IFQ and CDQ fisheries. This information is included as the proposed action may have an effect (albeit, likely minimal) on the distribution of halibut landings. It is not expected that the proposed action would impact the footprint of the sablefish fishery, thus it is not expected that the sablefish landing patterns would change. Note that Section 4.5.1.2 presents additional background on the CDQ communities and allocations. There are many additional resources that provide information on community-level commercial halibut and sablefish sector activities.[39] The limited scope of background

[39] Examples include AFSC Community Indices which provide commercial fisheries engagement indices, location quotient and regional quotient for the halibut and sablefish IFQ fisheries (Appendix 2.7A of the IFQ 20-year program

presented here is meant to frame available information that provides direct relevance to the proposed actions.

Communities are associated with the Area 4 halibut IFQ fisheries in a number of ways. One of the most direct ways is as a port of departure or landing for participating vessels. The harvesting activity can generate economic impacts for the departure and landing ports. This includes economic activity surrounding processing and secondary service providers. This includes patronizing businesses with bait, gear, and other provisions, businesses related to vessel maintenance, as well as businesses that are unrelated to fisheries, but impacted by more people coming through town (e.g., accommodations and restaurants).

In particular, communities can benefit from tax revenue associated with landings. The two primary landings taxes associated with the halibut IFQ fisheries are:

1. The Alaska Department of Revenue collects a **fisheries business tax** (also known as the "raw fish tax") from processors and persons who export unprocessed fishery resources from Alaska. Shore-based processors are assessed at a rate of 3% of the ex-vessel price paid to fishermen. The Division shares 50% of tax collected with the incorporated city and organized borough in which the processing took place. The remaining 50% of the revenue contributes to the State's General Fund.[40]

2. Both municipalities and boroughs are also authorized to levy a **raw fish tax** in addition to the state's fisheries business tax, which range from 1% to 3%. These rates and the associated annual revenues collected are available in Alaska Taxable.[41]

Communities can also benefit from the revenue generated from a borough or municipal sales tax, which are levied from anywhere between 1% and 7%. Revenues are collected through the sale of goods and services necessary in order to harvest IFQ on a commercial vessel (e.g., bait and gear). Sales tax percentages are listed by municipality or borough in Alaska Taxable.

Instead, Table 28 lists all the communities that received some amount of Area 4 halibut IFQ or CDQ landings in 2016. All the communities that received BSAI sablefish are also represented in this list, although some sablefish is also processed on CPs. From this list, the table also presents the percentage of

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review; NPFMC/ NMFS 2016), Section 2.7 of the IFQ 20-year program review (NPFMC/ NMFS 2016) and Appendix A to the EA/RIR/IRFA to the Catch Sharing Plan analysis (NPFMC 2013). This document includes as some basic statistical information on QS and CHP holdings by state and community as well as community profiles on Anchorage, Homer, Ketchikan, Kodiak, Petersburg, and Sitka.

Additionally, AFSC has produced an interactive map for recreational and commercial fishing, as well as subsistence fishing activities in the state of Alaska (http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php). The map displays statistics for on sportfishing licenses sold, sportfishing licenses held, charter guide licenses held, and active fishing business through 2011 (effort is current underway for an update of this information). This map links to individual community profiles produced by the science center.

[40] Alaska State taxes collected through The Alaska Department of Revenue are documented:
http://www.tax.alaska.gov/programs/programs/reports/AnnualReport.aspx?Year=2015#program60633

[41] Alaska Taxable (DOC 2016) details sales tax, bed tax, alcohol tax, car rental tax, raw fish tax, fish box tax, tobacco tax, and miscellaneous taxes by boroughs and municipalities:
https://www.commerce.alaska.gov/dcra/DCRARepoExt/RepoPubs/Taxable/2015%20Full.pdf

the total landings (in weight) represented by the Area 4 halibut IFQ and CDQ deliveries by port, as well as the percentage of the total landings (in weight) represented by the BSAI sablefish IFQ and CDQ deliveries in these communities for 2016. Table 28 demonstrates that for some communities, halibut is the primary species delivered. Note that Atka, Savoonga, and St. George are all CDQ communities and Adak is a CQE community. There are no communities for which sablefish makes up the majority of the landings.

Table 28 Communities that received deliveries of Area 4 halibut in 2016, and the percent of the total landings (in weight) that were Area 4 halibut compared to the percent of total landings (in weight) that were BSAI sablefish IFQ or CDQ

Port	% of total weight of landings halibut	% of total weight of landings sablefish
ADAK	62.4%	3.1%
AKUTAN	0.1%	0.0%
ATKA	95.6%	1.3%
DILLINGHAM	0.1%	0.0%
DUTCH HARBOR	0.3%	0.1%
HOMER	0.8%	0.0%
KING COVE	0.2%	0.0%
KODIAK	0.1%	0.0%
NAKNEK	0.0%	0.0%
NOME	9.8%	0.0%
SAND POINT	0.0%	0.0%
SAVOONGA	100.0%	0.0%
ST GEORGE ISLAND	100.0%	0.0%
ST PAUL ISLAND	4.0%	0.0%
TOGIAK	0.7%	0.0%

Source: ADF&G fish tickets sourced through AKFIN

As described in the 20-year IFQ Program Review (NMFPC/ NMFS 2016), the implementation of the IFQ Program fundamentally changed processing needs in the halibut IFQ fishery, with the market shift from a primarily frozen to a majority fresh market. This had extensive implications for existing halibut processors, many of which had previously invested in cold storage for the short, concentrated halibut seasons pre-IFQ. For processors previously active in the halibut fishery, this shift left them with excess capacity to make ice and freeze fish and increased competition for landings from new buyers, who did not need any infrastructure in the region. Many processors which were processing halibut or sablefish pre-IFQ, and have remained, have diversified into processing other species as well. There have been disparate impacts for processors that are off the road system (such as in Western Alaska and in the Aleutians), because this can make it more expensive to move fresh product. Thus, as can be seen in Table 28, many processors in BSAI coastal communities are diversified in other species as well. For additional information on halibut processors, refer to Section 2.4.2 of the 20-year IFQ Program Review (NPFMC/ NMFS 2016).

Some species are important for a community in terms of the processing employment and economic activity and tax revenue they generate. Some species are important to a community for harvest sector employment and the economic impacts that are generated from QS holders, vessel owners, and crew residing in and spending money in that community. Communities of residence for QS holders, vessel owners, and crew are not necessarily the communities near where the harvesting and processing activity takes place. Income generated from halibut fishing trips to a QS holder, vessel owner, and crew can also have a multiplier effect through the communities where they spend their money. This includes the impacts to CDQ residents and their communities (as described in Section 4.5.1.2).

4.5.5 Vessel Safety

The following describes only a few of the existing safety measures that apply to commercial fishing vessels in the BSAI, as informed by fishery representatives of the U.S. Coast Guard (USCG).

Commercial vessels that are greater than 79 ft LOA must have a "stability book", developed by a naval architect or another qualified individual, detailing the various loading conditions and capacities that pertain to that vessel. The USCG may conduct dockside exams to check that these larger vessels have documentation that stability tests were completed. Stability tests are reported to cost upwards of $5,000 and may vary depending upon the provider.[42]

All commercial vessels are subject to stability standards stating that vessels may not have instability resulting from overloading, improper loading, or lack of freeboard. A vessel's voyage may be terminated if any of those improprieties are found, before or after leaving port. A vessel with less than 6 inches of freeboard amidships may be considered to be operating in an especially hazardous condition and would not be allowed to leave port.

4.6 Analysis of Impacts: Alternative 1, No Action

If the Council adopts Alternative 1, No Action, Federal regulations at §679.2 would continue to require the discard of all halibut caught in pot gear in any BSAI reporting area, as described in Section 2.1. This alternative does not authorize pots as a legal gear type to harvest halibut in the BSAI.

Under the status quo, legal and sublegal-sized halibut discarded in the sablefish pot fishery in the BSAI would continue to constitute wastage (i.e., discards required by regulations). Participants that hold halibut quota would need to discard this halibut caught in the BSAI sablefish pot fishery and make a separate effort to catch their halibut IFQ or CDQ using HAL gear. This may generate additional costs for these participants.

Whale depredation would be expected to persist in the hook-and-line (HAL) halibut IFQ/ CDQ fishery under the no action alternative. Unlike sablefish QS holders, halibut QS holders currently do not have the ability to employ pot gear as a way to circumvent whale depredation on their target species. Instead, under status quo, a halibut QS holder's response would likely be continuing to employ techniques to avoid or mitigate the damages of such encounters. This may include dropping gear to "wait the whales out", moving to different fishing grounds, setting decoy sets to distract the whales, or leaving and returning at a later date. In addition to costs associated with damaged gear, measures taken to avoid depredation reduce fishing efficiency through variable operational costs (increased cost of fuel, labor, bait, crew provision) and through the opportunity cost of time lost that would have been available for additional fishing effort or dedicated to other fishing and non-fishing activities (NPFMC 2015). The cumulative costs associated with avoiding whale depredation will increase over time under Alternative 1, as participants incur these variable costs. Due to the types of costs it imposes on a vessel (financial as well as the opportunity cost of additional time spent in the fishing grounds), whale depredation often negatively affects crew moral (personal communication, J. Kaufman 2018; personal communication, Robert H. 2018).

Under the No Action alternative, there would be no changes to the current pot gear specifications in the sablefish fishery (i.e., both single and longline gear would continue to be permitted, 9-inch excluder

[42] See federal regulations at 46 CFR 28.500.

would be required on all pot gear used to harvest sablefish). In addition, there would continue to be no gear tending requirements. All vessels fishing IFQ sablefish would still need to possess a transmitting VMS consistent with §679.28(f)(3), (f)(4), and (f)(5). Some of the participants fishing sablefish CDQ also are required to have a transmitting VMS. Logbook requirements would stay the same; meaning all vessels using longline pot gear to harvest groundfish (such as sablefish) would continue to use logbooks. For a full comparison of regulations of Alternative 1 compared to Alternative 2, see Table 1.

In addition to not having the opportunity to retain halibut in pot gear in the BSAI, under Alternative 1 there would be no *required retention* of halibut IFQ or CDQ even if someone onboard the vessel has available halibut IFQ or CDQ designated for that area. As discussed further in Section 4.7.1, under Alternative 2 there may be some instances where the retention of halibut caught in pot gear may impose a cost (e.g., be an inconvenience) to the vessel operator, in particular in a circumstance where few halibut are caught and/ or the processor does not accept halibut.

4.7 Analysis of Impacts: Alternative 2, Allow Halibut Retention in Sablefish Pot Gear in the BSAI

The action alternative would allow (and require) the retention of legal-size halibut in pot gear used to fish BSAI sablefish IFQ or CDQ, provided the vessel possesses halibut IFQ or CDQ to account for the catch. The IFQ or CDQ used to account for the harvested halibut would need to correspond to the appropriate IPHC regulatory area.

As described in Section 2.2, the analysts assume that the language of Alternative 2 (allowing retention *in sablefish pot gear*) links the ability and requirement to retain halibut in pot gear in the BSAI to the presence of sablefish IFQ or CDQ, as well as the appropriate halibut IFQ or CDQ. The motion does not state that a minimum *amount* of sablefish quota is needed to retain halibut in pot gear. Section 4.7.6.1includes a discussion on the challenges with enforcing this type of link between the sablefish and halibut pot fisheries.

Section 2.2 also clarifies that the terms “incidental”, “targeted”, and “directed” are not used in the Federal regulations for the halibut IFQ/CDQ fishery. Nor do Federal regulations define a “sablefish pot”. Halibut is an IFQ species and retention is only allowed by those who hold the appropriate IFQ or are authorized to harvest halibut CDQ on behalf of a CDQ group. When IFQ/CDQ is not available, halibut is a prohibited species and must be discarded. While regulations do not refer to incidentally caught, or “non-targeted” halibut, this section highlights this distinction. This distinction can be important in describing the scope of expected socio-economic impacts.

4.7.1 Socio-economic Impacts of Alternative 2

There are two primary economic benefits from the adoption of Alternative 2. The first is in providing greater flexibility for IFQ and CDQ participants in the BSAI; allowing them options to fish their quota opportunistically and minimize variable costs. The second is in providing positive impacts to halibut user groups from increased efficiency in the use of the resource.

Decrease in Variable Costs for Participants

This action could provide greater flexibility for IFQ and CDQ participants in the BSAI. The BSAI sablefish fishery is widely dispersed and has a fraction of the CPUE to that of the Central GOA (personal communication, D. Hanselman, 2018). This fishery is typically not fully prosecuted, likely due to the costs associated with harvest (see Section 4.5.2.1). Alternative 2 could allow vessels the opportunity to minimize the variable costs associated with mitigating whale depredation, as listed in Section 3.8.2 (e.g., increased

fuel and bait, as well as the opportunity cost), by allowing participants the chance to opportunistically fish either sablefish or halibut quota in pot gear. For instance, additional revenue from halibut IFQ caught in a pot set, could make a trip out to Area 4D more economically feasible.

The extent to which halibut IFQ and CDQ participants would seek to take advantage of this opportunity, and the magnitude of halibut quota harvested in pot gear depends on several factors. First, it depends on whether the Council adopts elements that allow for a more targeted effort of halibut fishing in pot gear (i.e., Element 1 and Element 3) or whether the regulations and practical obstacles only allow for a more incidental harvest of halibut. The ability to target halibut, even within the same trip that sablefish is targeted on, may make this opportunity look more financially appealing to quota holders. A small amount of halibut, required to be retained incidentally in the sablefish pot fishery, may be inconsequential to the vessel's net revenue or even be considered a burden to some quota holders (as discussed below).

If they were able to target halibut more directly, participants may invest in new gear. Stakeholders have suggested that pots more similar to crab pots or pots used in the Pacific cod fishery may be more conducive to halibut fishing than the collapsible groundfish pots used in the sablefish pot fishery. Because crab pots may weight up to 800 pounds each, deploying single pots may be safer and make it less likely to lose gear. Stakeholders also suggested this opportunity could be most useful when fishing in Area 4A or 4D (personal communication, R. Hanson 2018; personal communication, J. Kauffman 2018).

Secondly, while whale depredation may increase the cost and resources it requires to prosecute the HAL halibut fisheries in the BSAI, nonetheless as demonstrated in Figure 32 and Figure 33, most of the quota in Area 4 is harvested on HAL gear every year. Even with the challenges associated with whale depredation, the gross revenues appear to outweigh the costs to prosecute the fishery, even if this includes moving to different fishing grounds. Thus, the amount of halibut IFQ/ CDQ harvested with pot gear also depends on an individual's marginal costs associated with harvesting halibut with pots and the expected returns (i.e., how effective pot gear is at prosecuting the halibut fishery in the BSAI). For many halibut quota holders, it may not be cost effective to switch to pot gear, even if there was more of a targeted opportunity available.

Based on the analysts' assumptions, being able to benefit from this action would require sablefish quota designated for the appropriate area as well as halibut quota designated for the appropriate area, and a vessel equipped to deploy pot gear in the BSAI. Thus, many halibut quota holders would experience large fixed costs in order to access this opportunity. The operators most likely to use the increased flexibility proposed in this amendment are those that are already fish sablefish quota with pot gear and who also hold halibut quota in the appropriate regulatory area. If the Council adopts Elements 1 and 3, and pot gear is shown to be a cost-effective way to harvest halibut quota relative to fishing HAL with whale predation, this may motivate more than just the small number of sablefish pot vessels to participate in this additional opportunity. Candidates for operators that may begin to land halibut quota that was harvested with pot gear include:

1. **BSAI sablefish IFQ/ CDQ holders that have previously fished with pot gear**

   → Would need access to halibut IFQ or CDQ for the appropriate area[43]

2. **Area 4 halibut IFQ/ CDQ holders that have previously fished with HAL gear**

   → Would need access to sablefish IFQ or CDQ for the appropriate area

[43] "Access" to halibut quota meaning, the individual would either need to purchase additional IFQ, lease CDQ from a CDQ group, or they would need to collaborate with someone who had the appropriate IFQ

→ May need to reconfigure their vessel or identify a vessel that could deploy pot gear

3. **Operators of BSAI Pacific cod pot vessels – *particularly due to the decline in Pacific cod TAC for 2018 which could drastically shorten the season for some participants***
   → Would need access to sablefish IFQ or CDQ for the appropriate area
   → Would need access to halibut IFQ or CDQ for the appropriate area
4. **Operators of GOA sablefish IFQ vessels that have recently fished with pot gear**
   → Would need access to sablefish IFQ or CDQ for the appropriate area
   → Would need access to halibut IFQ or CDQ for the appropriate area
5. **Other new entrants**
   → Would need access to sablefish IFQ or CDQ for the appropriate area
   → Would need access to halibut IFQ or CDQ for the appropriate area
   → Would need a vessel that could deploy pot gear

This list demonstrates some of the barriers to entry that will likely limit the participation and the impacts of the proposed action. For many vessels, this would be a difficult transition due to the required presence of quota and vessel configured for pot gear, but also the ocean conditions and weather challenges of prosecuting the BSAI can significantly increase the costs. Thus, while Table 19, Table 21, and Table 26 describe the number of vessels participating in the BSAI sablefish fishery, the BSAI Pacific cod fishery (including State waters GHL fishery), and the Area 4 halibut HAL fishery, respectively, even under regulations that allow for a more targeted effort of halibut in pot gear, it is not realistic that all of these participants would be impacted by this action. The number of IFQ/ CDQ participants taking advantage of this opportunity is not expected to be large. Note that if the Council chose not to tie the ability to retain halibut in the BSAI pot fishery to the sablefish fishery (i.e., allow a new gear type for halibut fishing on its own; not currently a proposed option), this would lower the barriers to entry and increase the overall expected impact of action. This action may directly affect more individuals that hold Area 4 halibut, allowing (and requiring) retention in any pot gear.

Alternative 2 includes a statement that NMFS would be monitoring this catch. A three-year review could identify targeted effort as the ratio of halibut and sablefish being harvested together and independently on one vessel. It could also track the magnitude of halibut shifting from HAL gear to the pot fishery.

Efficient Use of the Resource

Although sablefish pots in the BSAI typically catch low levels of legal-size halibut (see Table 5), some level of mortality is associated with the required discard of that catch (both from the discard process, as well as potentially whale depredation of discarded halibut). For 2018, discard mortality for halibut in the sablefish pot fishery is estimated at 9% for both CPs and CVs. For vessels with available halibut quota, allowing for increased efficiency through retention of halibut incidentally caught in the sablefish pot fishery could decrease total fishing mortality. If commercial discard mortality decreases, this could benefit all halibut users under a fixed allocation (commercial sector and Area 2C/ 3A charter sector). Moreover, to the extent that halibut from whale depredation goes unaccounted for, greater retention may benefit all users through greater accountability.

If the retention of halibut in pot gear remains incidental to the sablefish fishery and fishing behavior does not change (e.g., the vessel does not move to depths more likely to catch halibut), the benefits to the resource (and in turn, to the halibut users) are expected to be *de minimis*. If the Council adopts elements that allow for a more targeted effort of halibut IFQ/ CDQ fishing in pot gear (i.e., Element 1, allow the

use of single and longline pots and Element 3, exemption from the 9-inch tunnel opening), and/ or if participants change their fishing behavior to target halibut more directly with pots (e.g., move to depths more suitable for halibut), there may be a greater catch and retention of halibut in pot gear. This may provide resource benefits by reducing the halibut mortality from whale depredation in the halibut HAL fishery and the wastage associated with whale depredation of halibut discards from the pot fishery. Overall the shift of halibut IFQ/ CDQ caught in pot gear instead of HAL is not expected to be large.

Processor Impacts and the Value of the Fisheries

Because this action is not expected to impact the amount of sablefish harvested and will not change the gear types available for sablefish, it is not expected that the value of the sablefish fishery will change. Sablefish has a multitiered ex-vessel price based on size of fish and market conditions. Processor representatives state that sablefish harvested in pot gear versus on HAL generally render the same value, with several nuances. Sablefish from pot gear may be, on average, smaller. However, if sablefish caught on HAL have gaff holes or sand fleas, this can bring the value down (personal communication, J. Scoblic 2018; personal communication, S. Wilt 2018).

The overall amount of halibut IFQ/ CDQ is also not expected to change, since Area 4 generally prosecutes the full catch limits (see Figure 32 and Figure 33). There could be a change in value if the halibut IFQ/ CDQ that had previously been landed as fresh, is now landed as frozen. There may also be some changes in value due to the size selectivity of pot gear. Processors will often pay more for a larger sized halibut; thus, the harvester may receive lower returns per pound of quota for more, smaller fish (personal communication, J. Scoblic 2018; personal communication, S. Wilt 2018). Overall, the value of the halibut fishery is expected to stay the same or decrease slightly.

Section 4.5.4 lists the ports that have received Area 4 halibut IFQ/ CDQ in 2016. There could be some distributional changes in halibut landings; however, given the expected scope of halibut shifting from HAL to pot gear, and the limited number of halibut IFQ registered buyers/ processors any shift is expected to be minor. Thus, this action is not expected to affect communities through changes in distribution of landings or in tax revenues.

Impacts to CDQ Groups

The proposed action is not likely to directly affect residents of the CDQ communities. CDQ groups are responsible for determining how to use their allocations of CDQ to generate the maximum economic opportunity for their residents. This can include fishing opportunity, as well as other type of economic development. In some cases, when a species is accessible to residents in nearshore waters, the group will make the CDQ available to the residents that commercially fish. Most of these vessels are small. All of these vessels are smaller than 57 ft LOA, and the majority are under 32 ft LOA (NPFMC 2017d). In additional to needing sablefish quota as well, due to their size, it is unlikely that these vessels would attempt to use pot gear to harvest halibut CDQ.

In some cases, CDQ groups lease their halibut CDQ out to larger vessels for a fee. The groups will use the returns from that leased halibut quota to fund other economic development projects within the communities. Halibut CDQ that is leased out to larger vessels would have the opportunity (and requirement) to account for legal-size halibut caught in pot gear in the sablefish fishery, just as proposed for halibut IFQ.

Possible Negative Impacts

Alternative 2 would not only create the ***opportunity*** to retain legal-size halibut in sablefish pot gear when the appropriate IFQ or CDQ is available, it would also create the ***requirement*** to retain halibut with any available halibut quota. Section 679.7(f)(11) specifies a prohibition against discarding halibut or sablefish caught with fixed gear from any catcher vessel when any IFQ permit holder aboard holds unused halibut or sablefish IFQ for that vessel category and the IFQ regulatory area in which the vessel is operating. This prohibition essentially makes high-grading for IFQ species illegal. It is not possible for an IFQ holder to "leave their IFQ at home"; an enforcement officer would have an electronic system of available IFQ tied to the individual's CFEC permit and NMFS IFQ permit. Due to the management structure of the IFQ Program, enforcement has not needed to know what IFQ species the vessel is "targeting", only what they have available quota for and what it is retaining (see Section 4.7.6.1).

For instance, if the opportunity to retain halibut was only as incidental to the sablefish pot fishery (due to regulations and/ or practical challenges), low PSC rates mean a vessel may be required to keep a very small amount of legal-size halibut. There may be cases where this is an inconvenience for vessels.

If the ability to retain halibut in pot gear is tied to the sablefish fishery, any additional burden to the vessel may not be large. The vessel would already need to be following the requirements of IFQ fishing, such as Prior Notice of Landing (PNOL) and delivering between 6am and 6pm. An IFQ PNOL means that the operator of any vessel making an IFQ landing must notify OLE, Juneau, AK, no fewer than three hours before landing IFQ halibut or IFQ sablefish, unless permission to commence an IFQ landing within three hours of notification is granted by a clearing officer. Moreover, processors that accept sablefish generally accept halibut (personal communication, S. Wilt 2018; personal communication, J. Scoblic 2018).

4.7.2 Element 1: Single and Longline Pots

The first element under Alternative 2 states that the ability to retain halibut IFQ/CDQ in pot gear would apply for both single pot and longline pot configurations. Currently, both single pots and longline pots are permitted for the harvest of IFQ sablefish in the BSAI.

This is in contrast to regulations for the sablefish pot fishery in GOA. For the GOA sablefish pot fishery, Amendment 101 only authorizes the use of longline pots (§679.2). In (re)authorizing[44] sablefish pot gear for the GOA, some IFQ holders were particularly concerned with the potential for gear conflicts and grounds preemption. When set, pot gear has the ability "reserve" productive fishing grounds. Moreover, longline gear that is set over the top of a poorly marked set or lost pots, can be damaged or tangled and lost. Smaller vessels that cannot convert to pot gear, due to deck space and/ or safety concerns may be at a disadvantage. These vessels may incur costs, such as having to travel further or to less productive fishing grounds, if pot gear is being fished or stored in productive fishing areas.

The GOA analysis could not explain with certainty the level of gear conflict that would occur under this action. However, particularly for Southeast and Western Yakutat, which have a large number of smaller vessels as well as more concentrated fishing grounds, the Council determined certain measures were necessary to further reduce the likelihood of gear conflicts and grounds preemption. The benefits of using pot longlines versus single pots to maximize fishing efficiency and ex-vessel value of the fishery were noted. The Council prohibited the use of single pots for sablefish IFQ fishing in GOA to limit the number of anchor lines and buoys that may cause entanglement issues. Longline pot strings, reportedly worth

[44] Pot gear had been a legal gear type for harvesting sablefish in GOA prior to 1985. Implementation of Amendment 101 marked the first time pot gear was authorized for the harvest of sablefish since pre-IFQ program.

$10,000 to $12,000 each, can be parted and rejoined if they become wrapped up with other gear. In addition, pots that are deployed in a single pot format are generally larger and heavier because a single pot is more likely to drift than pots deployed in a longline format. The GOA analysis states that, compared to single pots, longline pot gear could enhance safety and may make it feasible for smaller vessels that could not use single pots in the sablefish IFQ fishery to use longline pot gear.

This action would not introduce new gear or a new fishery in the BSAI, unlike GOA Amendment 101. Although the only information available is anecdotal, there does not appear to be the same types of gear conflicts and grounds preemption issues in the BSAI, which could be due to the locations of the fishing grounds and the very small pool of vessels fishing for sablefish IFQ in the BSAI. In general, the vessels that have prosecuted the BSAI IFQ halibut and sablefish fisheries are larger. There are fewer vessels fishing IFQ in the BSAI than in the GOA and productive fishing grounds are not as contained in the BSAI as they are in the GOA (see maps in Figure 18 and Figure 19 to see spatial overlap in these fisheries). In particular, the number of vessels that have fished sablefish IFQ and CDQ with pot gear in the BSAI in the past is low. In 2016 there were 4 unique vessels. This element of the proposal would benefit from further public testimony on possible pot gear conflicts in the BSAI under the status quo.

As currently stated, Element 1 means that in the BSAI, participants would have the flexibility to choose the type of pot configuration that best fits their fishing practice and vessel. Adopting this element would clarify that the status quo of gear flexibility would persist in the BSAI, even when halibut quota is being harvested.

The effect of this alternative is the possibility of allowing for more effective targeting of halibut IFQ or CDQ with pot gear. Under status quo, even though both single and longline pot configurations are available to be used to harvest sablefish in the BSAI, using longline pot gear is the prevailing industry practice. As described in Section 3.4.5, pots used for sablefish in fisheries in waters off Alaska are medium-sized pots which are smaller than crab pots, but bigger than those used to target shrimp. While there is no regulatory definition for the shape of a “sablefish pot”, they are generally conical, trapezoidal, or rectangular.

In order to more effectively catch halibut, quota holders may wish to use larger, heavier pots that allow up to 100 lb halibut to more easily enter (personal communication, R. Hanson 2018). This pot design may be more like a crab pot and may be more suited to a single pot configuration. If the pots are too heavy and they are required to be longlined together, there may be a greater likelihood of lost gear. The avoidance of gear conflict between individuals and lost gear has both a private and a social benefit.

4.7.3 Element 2: Gear retrieval

The second element of the action alternative proposes the requirement of removing pot gear from the fishing grounds after five to ten days (sub-options), if the vessel has unfished sablefish IFQ (or CDQ) onboard. **No gear tending requirements currently exist in the BSAI sablefish pot fisheries.**

Amendment 101, which authorized the use of pot gear for sablefish IFQ fishing in GOA includes several gear redeployment and removal requirements. As demonstrated in Table 1 in Section 2.3, this includes the following, requirements differentiated by sablefish regulatory area.

- In the SEO sablefish area, a CV operator is required to remove longline pot gear from the fishing grounds when the vessel leaves the fishing grounds to make a landing.

- In the SEO sablefish area, a CP operator is required to redeploy or remove longline pot gear from the fishing grounds within five days after deploying the gear.

- In the WY and CGOA sablefish areas a CV or CP operator is required to redeploy or remove longline pot gear from the fishing grounds within five days after deploying the gear.

- In the WGOA sablefish areas a CV or CP operator is required to redeploy or remove longline pot gear from the fishing grounds within seven days after deploying the gear.

Similar to the prohibition against single pot configurations, the intention of these gear retrieval requirements in GOA are to avoid gear conflicts and grounds preemption. The proposed rule explains that due to the different characteristics of the sablefish areas and IFQ fleets, different gear redeployment and removal requirements were appropriate (81 FR 55408, August 19, 2016).

The proposed rule for Amendment 101 also stated that public testimony described that these gear conflict and grounds preemption issues that were a concern for GOA, had not been experienced in the BSAI. These operators noted that these concerns were likely greater in the GOA sablefish IFQ fishery than the BSAI sablefish IFQ fishery because some GOA sablefish areas have more constrained fishing grounds due to a smaller overall area and a larger number of participating vessels than in the BSAI. As shown in Figure 18 and Figure 19, historical sablefish pot gear fishing grounds generally do not overlap with historical halibut longline fishing grounds. This element of the proposal would benefit from further public testimony on possible pot gear conflicts in the BSAI under the status quo.

The proposed gear retrieval element for the BSAI sablefish fishery is different to the requirements adopted in the GOA. The GOA regulations are all based around a certain number of days gear can be left on the grounds before being redeployed or removed. The proposed action for the BSAI is based around a certain number of days gear can be left on the grounds before being removed, *if the vessel has unfished sablefish IFQ*. This qualifier makes a distinction to vessels that still have sablefish quota available, as opposed to a vessel that did not have access to any more sablefish quota. This leads the analysts to assume that the primary concern this element is set to address is the soak time of the pots. For instance, under Element 2 if a vessel chose to leave their pot gear on the fishing grounds after they were done fishing for the year, this element would not affect them. However, if the vessel was "still fishing" (i.e., the vessel still had access to available sablefish quota) gear would need to be removed. It is possible that this element is also meant to address gear conflicts or grounds preemption issues that may exist during the fishing season, but it is not clear. Again, this element would benefit from further testimony.

The analysts note that very rarely would a quota holder fish to their last pound of quota. Thus, the Council may wish to clarify what is meant to possess "unfished" sablefish IFQ and if that would include *de minimis* amounts.

As written, this element of the package would add a new requirement to all BSAI sablefish pot participants, regardless of whether the vessel intended to retain halibut IFQ/ CDQ. This new regulation would limit the time pot gear could be set in the BSAI pot fishery for sablefish fishing. As halibut retention would presumably be connected to the presence of sablefish quota, this rule would also dictate soak time for the incidental or targeted retention of halibut in pot gear as well. Halibut mortality is positively correlated with longer pot soak time; the length of the soak time can exacerbate the mortality caused by hooking injuries and increase the potential for amphipod predation. However, in addition to the public benefit of decreased halibut and sablefish wastage due to longer soak times, there is also a private benefit to delivering marketable product to the processors.

Implementation of a gear retrieval regulation based on available sablefish quota would add some practical challenges as well. For an enforcement officer to know if a vessel had unfished sablefish quota when the vessel was not near the gear, the officer would need a way to link the gear with the quota holder(s) NMFS IFQ ID. If the requirement included marking buoys with this ID number for every quota holder harvesting

with that gear, it would need to be updated every time there is a change in the quota holder(s) actively using that gear. Often, quota holders will consolidate quota from more than one quota holder on one vessel in order to share variable cost. As the quota holders harvesting on a particular vessel may change slightly from year to year, or even at different parts of the season, the vessel operators would need to update buoy identification to represent the active quota holder using that vessel. This may be impractical and costly to the participants. Note that enforcement representatives have expressed the difficulty of enforcing the current gear tending requirements in the GOA as well (Section 4.7.6.1).

4.7.4 Element 3: Tunnel Opening

The third element of the action alternative would create an exemption to an existing gear specification. According to §679.2 under authorized gear, each pot used to fish for groundfish must be equipped with rigid tunnel openings that are no wider than 9 inches and no higher than 9 inches, or soft tunnel openings with dimensions that are no wider than 9 inches. This element considers an exemption to this requirement for vessels that have unfished halibut IFQ (or CDQ) onboard.

Similar to the use of a single pot configuration, the intent of this alternative would be to allow for more effective harvest of halibut IFQ or CDQ with pot gear. As stated in several other places in this analysis, this type of exemption could expand both the environmental and socio-economic impacts of the action. In terms of environmental impacts, Section 3.5.6.2 of this analysis discusses the potential changes in size selectivity, magnitude, and possibly even catch composition of bycatch in pots that have a tunnel opening wider than 9-inches.

In terms of potential socio-economic impacts, adoption of this element would be expected to allow for greater flexibility for IFQ and CDQ participants (that hold both sablefish and halibut quota) to use their quota opportunistically and minimize variable costs. As described in Section 4.7.1, the ability to participate in a mixed-trip, harvesting both halibut and sablefish quota, may make this opportunity more viable for some sablefish quota holders.

Moreover, if there is a shift in some of the halibut IFQ/CDQ from HAL gear to pot gear, this may reduce some mortality resulting from whale depredation of HAL gear that may be unobserved. This could potentially provide positive impacts to halibut user groups from increased efficiency in the harvesting of the resource.

4.7.5 Element 4: Monitoring

Alternative 2, Element 4 states that all vessels using pot gear to fish IFQ would be required to use logbooks and VMS under the proposed action. Section 4.7.6.3 estimates the impact of this requirement by comparing it to the status quo for vessels participating in the sablefish IFQ/CDQ fisheries.

4.7.6 Management Considerations

4.7.6.1 Enforcement

The following describes enforcement challenges and recommendations, as informed by OLE (Office of Law Enforcement) representatives for NMFS Fisheries Enforcement. In general, OLE noted challenges regarding consistency with GOA regulations, and that their priority would be maintaining consistency across the GOA and BSAI where possible, while balancing maximum flexibility for fishermen. As in the GOA, this action poses some enforcement challenges that are not easily solved.

Currently, legal-size, incidentally-caught halibut are required to be retained in the BSAI HAL sablefish fishery if any permit holder on the vessel has unharvested halibut IFQ. The procedures NMFS uses to

verify that sufficient halibut IFQ are held by permit holders onboard a HAL vessel fishing sablefish could be used for a vessel using pot gear to fish a mix of sablefish and halibut IFQ (as is already done with solely sablefish IFQ in pots). Since IFQ are specific to regulatory area and vessel size category, the amount of halibut retained and landed by a vessel is crosschecked against the IFQ permit database to verify that the permit holder's IFQ balance is sufficient for that area and vessel size category. In addition, OLE can reference information in NMFS logbooks and IPHC logbooks at the time of landing.

Regarding Alternative 2:
OLE recommends allowing and requiring the retention of legal-size halibut, for consistency with GOA regulations.

However, OLE also described the difficulty in ensuring that these fisheries were linked. Under Amendment 101 in GOA, the ability to retain halibut in pot gear is also dependent on the availability of sablefish IFQ (in addition to following all the regulations under for sablefish IFQ fishing with pot gear described in §679.42(l)). Since there is no requirement or regulatory definition that an IFQ species be a certain proportion of the vessel's total catch, Enforcement representatives stated that, particularly in the field, it can be very difficult to prove what a vessel is "fishing for". Participants with appropriate IFQ for both species could make the claim that they were fishing sablefish, but only happened to catch halibut. Enforcement is able to identify that participants have IFQ for the species they are retaining.

Element 1: Single/longline pots
While the regulations for the GOA prohibit use of single pots, *OLE did not provide a specific recommendation regarding use of single and/or longline pots.*

Element 2: Gear retrieval
OLE recommends the BSAI remains consistent with Western Gulf regulations by adopting the requirement that a vessel operator must redeploy or remove all [longline] pot gear that is assigned to the vessel and deployed to fish IFQ sablefish within seven days of deploying the gear. (§679.42(k)(5)(iii)(D)).

Element 3: Tunnel opening
OLE recommends keeping the existing 9-inch maximum tunnel opening requirement for all areas for consistency. A different requirement could make enforcement difficult in GOA locations near the BSAI. Additionally, having different applicability of the 9-inch requirement could make general enforcement difficult.

Element 4: Logbooks and VMS
VMS is already required for federal waters (§679.42(k)(1)(i)). However, state AI sablefish requirements do not require VMS. *OLE recommends that if the state adopts these rules, a VMS requirement be adopted as well. OLE recommends requiring the use of Daily Fishing Logbook (DFL) for consistency with GOA requirements (§679.42(k)(7)(i)).*

OLE noted that all the above proposed requirements (with exception of single/longline pot and logbook & VMS) are difficult to enforce. They also noted that consistency across all areas makes enforcement easier, even in GOA areas that are not part of this proposal.

4.7.6.2 In-season Management

In-season management closely monitors fishing activity in the BSAI and closes groundfish fisheries when the total allowable catch is reached. In-season management actively manages both groundfish harvest by pot gear vessels and incidental catch of non-target species in these fisheries. If an Overfishing Level (OFL) is at risk of being met or exceeded, under §679.20, specific fisheries identified by gear and area

that incur the greatest incidental catch of that species are closed. If the rate of catch is not sufficiently slowed, then closures expand to other fisheries. Overfishing level closures are rare. Also, under §679.25, NMFS has the authority to conduct in-season adjustments, including: closures, modification of the allowable gear to be used in all or part of a managements area, adjustments of TAC and PSC limits, and interim closures for groundfish species. This authority provides flexibility for in-season management to make adjustments to the fishery in order to prevent reaching or exceeding an OFL.

Under §679.25, NMFS can close groundfish fisheries, including sablefish IFQ, but does not have the authority to close the halibut IFQ fishery, which is under the authority of the Halibut Act. NMFS has cited concerns that if pot gear use in the PIHCZ increases, it could result in the increased incidental catch of PIBKC. This will likely result in in-season actions to prevent meeting or exceeding the PIBKC OFL. These closures may not be limited to pot gear and could impact other fisheries in the BSAI.

4.7.6.3 Monitoring Requirements and Reporting

If the Council proceeds with Alternative 2, NMFS has expressed concern over any additional pot fishing activity not only in the PIHCZ, but also in the PIBKC stock boundary area. NMFS recommends that the Council also adopt Element 4, the requirement that all vessels retaining an IFQ species in pot gear use logbooks and VMS to ensure consistency in monitoring fishery behavior, particularly in these areas. These requirements would also be consistent with the regulations in the GOA under Amendment 101.

The IFQ and CDQ Programs already include requirements for participants to report specific information to NMFS and other management agencies for management, monitoring, and enforcement purposes. The IFQ Program Review provides a comprehensive overview of the recordkeeping and reporting requirements in this Program (NPFMC 2016). In general, vessels that fish halibut and sablefish CDQ must adhere to many of the same requirements, although there are some differences. There is overlap in vessels that fish for halibut and sablefish IFQ and vessels that fish halibut and sablefish CDQ, particularly among the larger vessel. A vessel can retain both CDQ and IFQ species on the same trip.

All vessels that participated in the BSAI sablefish IFQ or CDQ pot fishery in 2016 likely had VMS and maintained a Daily Fishing Logbook (DFL) already. However, under Alternative 2, some vessels that may be impacted by this action may need to install VMS or begin maintaining a DFL. The following sub-sections describe the qualification for both VMS and DFL and the number of vessels that might be impacted by these additional requirements.

VMS

NMFS requires the owners and operators of selected vessels participating in federally managed groundfish and crab fisheries off Alaska to obtain, install, and maintain an operational, NMFS-approved VMS. Tracking of vessel location using VMS is required to monitor compliance with complicated time and area closures in the GOA and BSAI designed to protect Steller sea lions or essential fish habitat, to monitor compliance with area-specific catch allocations, and to monitor compliance with requirements to redeploy or remove fishing gear from commercial fishing grounds.

The VMS units integrate global positioning system and communications electronics in a single, tamper-resistant package to automatically determine the vessel's position several times per hour. The units can be set to transmit a vessel's location periodically and automatically to an overhead satellite in real time. The VMS unit is passive and automatic, requiring no reporting effort by the vessel operator.

Vessels fishing for IFQ sablefish in the BSAI are required to have a transmitting VMS on board, as are any vessels with a FFP fishing in the Aleutian Islands.[45] Vessels fishing for CDQ sablefish and vessels fishing for IFQ or CDQ halibut in the Bering Sea are not required to have VMS. However, any vessel that carries a transmitting VMS while fishing for halibut in Area 4A, 4B, 4C, or 4D is exempt from vessel clearance requirements in the halibut annual management measures.

VMS is a tamperproof system, set to report a vessel identification and location to OLE at fixed 30-minute intervals. VMS is required in some fisheries to ensure that vessels comply with area restrictions and to provide enforcement a tool to monitor compliance. The basic function of a VMS is to determine a vessel's location at a given time and periodically transmit this information to an onshore monitoring system. A communications service provider receives the transmission and relays it to NMFS, Office for Law Enforcement (OLE) who then provides VMS data access through vTrack to other government users after they sign a non-disclosure agreement. Vessel owners and operators also may have their vessel VMS data relayed to a third-party designee such as Marine Exchange of Alaska so that vessel owners can track their vessels and fleets.

There are both fixed and variable costs associated with the installation and operation of a new VMS. Average fixed cost for installation and activation is about $3,500.[46] The NOAA funded, Pacific States Marine Fisheries Commission administered, reimbursement program will aid eligible users up to $3,100 of that initial cost.[47] Variable costs may include transmission costs ranging from $40 to $55 per month depending on the unit installed and potential maintenance and repairs averaging to $77 per year.

At this time, Alternative 2 is anticipated to provide an opportunity to an existing fishing fleet and the number of vessels estimated to enter the sablefish IFQ pot fishery is limited. NMFS estimates that there are three vessels that have been involved in the sablefish CDQ or IFQ fishery within the last five years (2012 through 2016) that would fall under these requirements.

NMFS does not anticipate an increase in sablefish IFQ fishing from this action. The concern is from vessels that typically target halibut with HAL that want to use pot gear. There are no regulations against this and OLE does not differentiate between fishing for sablefish IFQ and halibut IFQ as long as IFQ pounds are onboard. NMFS anticipates that halibut pot fishing could occur in the PIHCZ unless the Council adds an element to close all pot fishing within this area (see recommendations in Section 3.6.3.2). Additionally, pot fishing could still occur in the PIBKC stock boundary. Careful monitoring, in addition to pot gear closures in the PIHCZ, would reduce concerns about overfishing of PIBKC, Alaska's only species subject to overfishing.

Logbook Reporting

The operator of a catcher vessel 60 ft or greater LOA, using fixed gear, setline, or pot gear to harvest IFQ sablefish or IFQ halibut must maintain a longline and pot gear Federal daily fishing logbook (DFL). All catcher processors must maintain also maintain a daily catcher processor logbook (DCPL). DFLs are available to catcher vessels free of charge from NMFS Sustainable Fisheries Division. The DFL includes information on set number, time and date gear was set and hauled, beginning and end positions, permit numbers, and estimated total hail weight for each set. The DFL also requires the operator to record the discard and disposition information of the trip, including recording of discard quantities over the maximum retainable amount for Pacific cod or rockfish when closed to directed fishing. The operator

[45] https://alaskafisheries.noaa.gov/fisheries/cwm
[46] http://www.cio.noaa.gov/itmanagement/pdfs/0445Rev_BF42.pdf
[47] For more information on the reimbursement program see http://www.psmfc.org/program/vessel-monitoring-systemreimbursement-program-vms.

may use an electronic reporting option, eLogbooks, if they choose, with some exceptions. Few, if any, IFQ catcher vessels utilize the eLogbook option, which was originally developed for trawl catcher processors. NMFS plans to better customize the eLogbook option for catcher vessels so it is a more viable option for participants.

In addition to federal regulations, the IPHC requires that any operator of any US vessel fishing for halibut that has an overall length of 26 ft or greater must maintain an accurate log of halibut fishing operations.[48]

Table 29 shows which vessels must maintain a DFL, DCPL, or electronic logbook (elog) under current regulations. No catcher vessels under 60 ft LOA using longline gear have to fill out a daily logbook under the status quo.

Table 29 Logbook Requirements for Federal Fisheries Permit Holders

Vessel Category	Gear	Vessel size	Fisheries	Paper logbook requirement & logbook type	Electronic Logbook (elog) requirement
Catcher Vessel	Other (Jig)	<60ft LOA	Groundfish	No	No
	Longline	<26 ft LOA	IFQ halibut	No	No
		26-59 ft LOA	Groundfish	No	No
			IFQ halibut	CV LL/Pot DFL or IPHC logbook	No
		>60ft LOA	Groundfish, IFQ sablefish, IFQ halibut	CV LL/Pot DFL	No
	Longline Pot	All lengths in GOA	Groundfish, IFQ sablefish, IFQ halibut	CV LL/Pot DFL	No
	Pot	<60ft LOA	Groundfish	CV LL/Pot DFL	No
		>60ft LOA	Groundfish, CR Crab	CV LL/Pot DFL	No
	Trawl	<60ft LOA	Groundfish	No	No
		>60ft LOA	Groundfish	CV Trawl DFL	No, but some use it voluntarily
Catcher Processor	Longline	All lengths	Groundfish, IQF sablefish, IFQ PHLB, CDQ PHLB	CP LL/Pot DCFL	Yes – if required to use flow scale
	Longline Pot	All lengths	Groundfish, IQF sablefish, IFQ PHLB, CDQ PHLB	CP LL/Pot DCFL	Yes – if required to use flow scale
	Pot	All lengths	Groundfish, IQF sablefish, IFQ PHLB, CDQ PHLB, CR Crab	CP LL/Pot DCFL	Yes – if required to use flow scale
	Trawl	All lengths	Groundfish	CP Trawl DCFL	Yes – if required to use flow scale
Mothership	All gear types	All lengths	Groundfish	No	Yes

Under Alternative 2, all CVs or CPs using pot gear to fish IFQ would be required to use logbooks. The analysts assume that the Council is referring to DFL in this element of Alternative 2. Many of the vessels that have previously participated in the sablefish CDQ or IFQ fishery (with pot or HAL gear) within the last five years (2012 through 2016) are at least 60 ft LOA, and therefore already required to maintain a DFL. In addition, there are safety issues for vessels under 50 ft LOA deploying pot gear in the BSAI, thus vessels less than 50 ft LOA are uncommon. Therefore, the universe of participants considered as potentially retaining halibut IFQ or CDQ in pot gear and falling under these new DFL requirements, includes vessels 50 ft or greater but less than 60 ft LOA that participated in the sablefish CDQ or IFQ

[48] https://www.iphc.int/uploads/pdf/2017iphcregs.pdf

fishery (with pot or HAL gear) within the last five years. Based on this pool of participants, NMFS estimates 11 vessels could need to begin using DFL under this action.

Observer Program and Sampling

All participants in the federally-managed commercial groundfish fisheries off Alaska are subject to Observer Program requirements. Vessels and processors are placed into one of two observer coverage categories: 1) the full coverage category, or 2) the partial coverage category. Described at §679.51(a)(1), the partial coverage category includes catcher vessels when fishing for sablefish IFQ or fixed gear sablefish CDQ.

Each year, NMFS releases an Annual Deployment Plan (ADP) that documents how the agency intends to assign fishery observers and Electronic Monitoring (EM) to vessels for the upcoming year. For vessels in the partial coverage category, the ADP describes the sampling design and selection rate—the portion of trips (or vessels) that are sampled. In 2018, the sampling design depends on EM, gear fished, and tender deliveries and vessels that fish with longline pot gear fall into 3 categories:

- EM selection pool – composed of fixed gear boats that opted into the EM pool and were approved by NMFS. In 2018, NMFS approved 141 vessels to be in the EM selection pool.

- Pot trip-selection pool -- composed of all catcher vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing pot gear, including vessels fishing longline pot gear. In 2018, the deployment rate for pot vessels is 16.21%, which equates to 53 trips expected to be observed.[49]

- No selection pool -- Longline and pot catcher vessels less than 40 ft LOA are not subject to observer coverage.

Observer deployment and sampling techniques would not change under this suite of alternatives.

Prohibited Species Catch Estimation

NMFS estimates of PSC are derived from observer data, which is an independent source of information, rather than from industry reported catch. In the CAS, the observer data are used to create PSC rates (a ratio of the estimated PSC in the sampled hauls to the estimated total catch in sampled hauls). On observed trips with unsampled hauls, an estimate of total PSC (by species) for the trip is derived by expanding a PSC rate from sampled hauls during the trip to the total catch of groundfish (retained + discarded) during the trip. For trips that are unobserved, the PSC rates are applied to industry reported landings of retained catch. Depending on the observer data that are available, the extrapolation from observed vessels to unobserved vessels is based on varying levels of post-stratification. Data are matched based on processing sector (e.g. CV or CP), week, fishery (e.g., Pacific cod), gear (e.g., pot), and Federal reporting area. If data are not available from an observed vessel within the same sector then rates are applied based on observer data from all sectors in the same target fishery, using the same gear, and fishing in the same Federal reporting area. If observer data are not available from any vessels within the same week then a three-week average is used from all vessels in the same target fishery using the same gear and fishing in the same Federal reporting area. If data are not available within a three-week period then a three-month average is used. Finally, if data from the same Federal reporting area are not available then

[49] https://alaskafisheries.noaa.gov/sites/default/files/final_2018_adp.pdf

observer data from the fishery and the FMP area (e.g. BSAI) as a whole will be applied. The PSC for crab are currently estimated in numbers of crab. When the observer program obtains samples of crab, both the weight and the number of crab in the sample are collected. NMFS then converts the sample weights into numbers of crabs in the haul. The number of crabs in each sampled haul is then used in PSC estimation (as described above) so that NMFS can monitor PSC limits on the number of crabs. For further information see Cahalan et al (2015).

4.7.7 Vessel Safety

This action is not expected to impact the status quo of vessel safety. All vessels over 79 ft would still be required to abide by safety requirements for stability, and all except one vessel that have fished sablefish quota in the BSAI from 2011-2016 are over 79 ft. Vessels are not being required to carry any extra gear and have the option to participate in the opportunity created by this action.

4.7.8 Affected Small Entities

Section 603 of the Regulatory Flexibility Act (RFA) requires that an initial regulatory flexibility analysis (IRFA) be prepared to identify if a proposed action will result in a disproportionate and/ or significant adverse economic impact on the directly regulated small entities, and to consider any alternatives that would lessen this adverse economic impact to those small entities. As of January 2017, NMFS Alaska Region will prepare the IRFA in the classification section of the proposed rule for an action. Therefore, the preparation of a separate IRFA is not necessary for Council final actions on this issue. This section will provide information that NMFS will use to prepare the IRFA for this action, namely a description and estimate of the number of small, direction regulated entities to which the proposed action will apply. *This section will be completed when the Council has identified a preliminary preferred alternative.*

4.8 Summation of the Alternatives with Respect to Net Benefit to the Nation

This section will be completed when the Council has identified a preliminary preferred alternative.

5 Magnuson-Stevens Act and FMP Considerations

5.1 Magnuson-Stevens Act National Standards

Below are the 10 National Standards as contained in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). In recommending a preferred alternative, the Council must consider how to balance the national standards.

National Standard 1 — Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

National Standard 2 — Conservation and management measures shall be based upon the best scientific information available.

National Standard 3 — To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

National Standard 4 — Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be; (A) fair and equitable to all such fishermen, (B) reasonably calculated to promote conservation, and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

National Standard 5 — Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources, except that no such measure shall have economic allocation as its sole purpose.

National Standard 6 — Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

National Standard 7 — Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

National Standard 8 — Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of National Standard 2, in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

National Standard 9 — Conservation and management measures shall, to the extent practicable, (A) minimize bycatch, and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

National Standard 10 — Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Although this action is primarily centered around changes to Federal regulations regarding the retention of halibut, this action would be implemented in connection with the sablefish IFQ fishery, a groundfish fishery managed under the Magnuson-Stevens Act. *Thus, when the Council identifies a preliminary*

preferred alternative, this section would be updated to describe how each alternative is consistent with the National Standards, where applicable.

5.2 Council's Ecosystem Vision Statement

In February 2014, the Council adopted, as Council policy, the following:

> **Ecosystem Approach for the North Pacific Fishery Management Council**
>
> ***Value Statement***
>
> The Gulf of Alaska, Bering Sea, and Aleutian Islands are some of the most biologically productive and unique marine ecosystems in the world, supporting globally significant populations of marine mammals, seabirds, fish, and shellfish. This region produces over half the nation's seafood and supports robust fishing communities, recreational fisheries, and a subsistence way of life. The Arctic ecosystem is a dynamic environment that is experiencing an unprecedented rate of loss of sea ice and other effects of climate change, resulting in elevated levels of risk and uncertainty. The North Pacific Fishery Management Council has an important stewardship responsibility for these resources, their productivity, and their sustainability for future generations.
>
> ***Vision Statement***
>
> The Council envisions sustainable fisheries that provide benefits for harvesters, processors, recreational and subsistence users, and fishing communities, which (1) are maintained by healthy, productive, biodiverse, resilient marine ecosystems that support a range of services; (2) support robust populations of marine species at all trophic levels, including marine mammals and seabirds; and (3) are managed using a precautionary, transparent, and inclusive process that allows for analyses of tradeoffs, accounts for changing conditions, and mitigates threats.
>
> ***Implementation Strategy***
>
> The Council intends that fishery management explicitly take into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species. Implementation will be responsive to changes in the ecosystem and our understanding of those dynamics, incorporate the best available science (including local and traditional knowledge), and engage scientists, managers, and the public.
>
> The vision statement shall be given effect through all of the Council's work, including long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management.

When the Council identifies a preliminary preferred alternative, this section will include a discussion of how the Council's action is consistent with its ecosystem approach policy.

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