EXPANDED DISCUSSION PAPER

ALLOW THE USE OF POT GEAR IN THE GULF OF ALASKA SABLEFISH IFQ FISHERY

North Pacific Fishery Management Council

November 8, 2013

EXECUTIVE SUMMARY

A 2006 proposal to allow the use of pot gear in the Gulf of Alaska (GOA) sablefish individual fishing quota (IFQ) program was accepted for consideration by the Council from its 2009 cycle for IFQ proposals. The Council reviewed a preliminary discussion paper in June 2013 and a GOA Sablefish Gear Committee report in October 2013. Options for area management (entire GOA or Southeast sablefish regulatory area only) and pot gear restrictions (single pots and/or longline pots; configuration; marking, deployment) are under consideration. While many committee recommendations were unanimous (allow longline pot gear only in the entire GOA), whether to require removal of pots from the fishing grounds when not being fished requires additional consideration. Also consideration for unique characteristics of the Southeast sablefish IFQ fleet was recommended.

The Council requested that this revised discussion paper address a wider range of management issues that fall into two general categories: conservation of marine resources (sablefish and whales) and gear restrictions. The first category addresses the purpose and need for the action while the second category would result in amendments to the GOA Groundfish Fishery Management Plan (FMP) and Federal regulations. As the Council considers adoption of restrictions on the use of pot gear in the GOA sablefish IFQ fishery it should be aware that it would be creating a new gear category that currently is not defined in Federal or State of Alaska regulations; only a groundfish pot is so defined. Adopting limitations on the use of sablefish pots (unique to the GOA sablefish IFQ fishery) also would incur economic costs to the fleet that might otherwise use the same generic pot gear in other GOA fisheries (i.e., Pacific cod) or in the Bering Sea and Aleutian Islands, where proposed gear are not implemented. Costs would increase as additional restrictions are implemented.

After review of this paper in December 2013, the Council may identify a problem statement and alternatives for an analysis to amend the FMP and Federal regulations to allow pot gear in the GOA sablefish IFQ fishery. The Council may identify exceptions to proposed regulations either by area (Southeast Alaska) or by vessel category (C class) to recognize safety issues or other fleet characteristics. The earliest longline pot gear could be expected to be allowed in the GOA is 2015.A draft problem statement and management alternatives are provided for Council consideration based on committee recommendations.

INTRODUCTION

The North Pacific Fishery Management Council (Council) called for proposals to amend the commercial halibut/sablefish Individual Fishing Quota (IFQ) Program during summer 2009. The IFQ Implementation Committee convened in November 2009 to review IFQ proposals and recommended that several proposals be advanced for consideration by the Council[1]. The committee reconvened in February 2010 to consider a few late proposals. The Council then recommended that five proposals from the committee recommendations be developed into analyses for Council action. The Council forwarded preferred alternatives for five proposed actions[2] in 2011 and 2012 to NMFS for approval and implementation. Final action was taken on a new proposal[3] in 2013.

In April 2012, the Council also adopted committee priorities for developing four proposals into discussion papers prior to deciding whether to initiate analyses. The Council requested discussion papers, as time

[1] http://www.alaskafisheries.noaa.gov/npfmc/halibut/sablefish-ifq-program.html
[2] 1) Revise CQE vessel use caps (October 2011); 2) Allow Area 3A CQEs to purchase category D halibut QS; 3) Set control date for hired skipper program (April 2011); 4) Allow IFQ from category D QS to be fished on Category C vessels in Area 4B (April 2012); and 5) Establish a CQE Program in Area 4B (February 2012).
[3] Allow CQE communities to purchase any size block of halibut and sablefish QS (April 2013)

was available after other higher Council priorities[4]. In April 2013, the Council recommended that the International Pacific Halibut Commission proceed with considering a proposed action based on an expanded discussion paper[5] and the request for a paper on another proposal[6] was withdrawn.

A preliminary discussion paper was reviewed by the Council in June 2013. At that meeting, the Council called for nominations to a new GOA Sablefish Gear Committee. The committee convened on September 30, 2013 and provided information to expand the paper, requested additional information, and recommended the proposed action for analysis.

This revised discussion paper considers a proposed action to allow the use of pots to retain sablefish IFQs in the GOA.[7] It addresses the following issues that were requested in April 2012 (and were addressed in a paper dated May 2013 and reviewed by the Council in June 2013). Additional topics were added by the Council in June 2013 after reviewing the paper, and October 2013 (*in italics)* after reviewing a committee report. In sum, the Council requested a wide range of issues to be addressed in the paper but the issues break into two main topics: 1) potential conservation benefits to marine mammals, seabirds, sablefish, Pacific halibut, and rockfishes and 2) pot gear issues: grounds preemption and gear configurations/storage/soak times. The complete list of topics requested to be covered in this paper are listed below.

1) Area management (SE vs GOA)
2) Gear restrictions
    a. single vs longline pots
    b. pots retained on grounds for long soaks vs retrieved during deliveries (linked to c. and d.)
    c. pot storage (linked to a. and d.)
    d. pot soak time (linked to a. and c.)
    e. gear configuration requirements
    f. gear conflicts/ between all gear types
    g. use the 200 fathom depth contour to mark open areas
    h. pre-emption of fishing grounds due to lost gear
    i. cost of gear conversion from longline to pot gear
    j. vessel demographics: vessel size by area and quota share size by area
    k. biodegradability of twine used for escape ports at sablefish fishing depths
    l. a wider range of gear location methods than only AIS as found in the committee report
    m. pot limits
3) Halibut issues
    a. exacerbation of halibut mortality
    b. shifting predation to halibut
    c. halibut bycatch by different pot configurations
4) Dynamic (social/economic) effects
    a. safety issue related to use of pots by small vessels
    b. crew employment
    c. QS prices
5) Additional topics
    a. whale depredation and interactions
    b. whale deterrent work in progress
    c. Canadian sablefish gear usage and pricing by gear type
    d. review of current literature on whale predation

[4] Council staff also organized a halibut bycatch workshop, and prepared analyses of GOA FMP Amendment 95 to reduce halibut bycatch in groundfish fisheries and a revised Area 2C and Area 3A Halibut Catch Sharing Plan.
[5] Allow IFQ halibut to be retained in IFQ sablefish pots in Area 4A.
[6] Identify reasons for unharvested halibut IFQ in Area 4.
[7] The Council expanded the original proposed area of Southeast Alaska to the entire GOA

e. ongoing acoustic research for avoiding whale depredation
f. status of the GOA sablefish stock
g. status of the GOA Pacific halibut stock

MANAGEMENT BACKGROUND FROM 2009 CALL FOR IFQ PROPOSALS

Mr. Michael Douville of Craig, Alaska submitted a proposal (see Appendix 2) on March 31, 2006 to allow the use of pots in the Gulf of Alaska "southeast" sablefish fishery. He identified that his proposal can address several problems which the Council is working on: a) seabird by-catch and b) interaction with whales. He identified that there would be no negative impact on anyone under his proposal. As proposed, fishermen could choose to use pots, but would not be required to use them. He identified potential positive outcomes of a decline in seabird by-catch, including albatross, and a decrease in fishing gear/whale activity. Bycatch of rockfish would also be reduced, with less bait and effort to catch the same amount of fish. He suggested that the use of bird deterrent lines is cumbersome and unnecessary for many areas in Southeast Alaska and that research has demonstrated that whales will continue to take fish from longline gear.

The *IFQ Implementation Committee* in November 2009 forwarded this proposal for Council consideration due to changes in conditions on the fishing grounds since the prohibition on pot gear in this fishery was implemented. The committee noted that while seabird interactions are no longer a serious concern, there have been extreme whale interactions with the fleet in the GOA. Allowing pot gear in this fishery could mitigate challenges, but there are a number of implications that must be considered, such as gear conflicts, gear loss, and changes in crew jobs. The Team adopted the following motion.

"*Recommend that the proposal has merit for Council review and analysis. If the Council adopts this proposal for analysis the team recommended that the proposal be expanded to the GOA, and the analysis should address the following issues: 1) restrictions to gear usage (a) single v longline pots, b) pots retained on grounds for long soaks v retrieved during deliveries, c) pot storage, d) gear configuration requirements; e) gear conflicts, f) use the 200 fathom depth contour to mark open areas, g) pot soak timeslot; 2) area management (SE v GOA); 3) exacerbation of halibut mortality; 4) dynamic (social/economic) effects, including a) small vessels could not safely use pots, b) crew employment, c) QS prices; d)ongoing acoustic research for avoiding whale depredation.*" Passed 10:1.

An *interagency staff group* reviewed this proposal and commented, "This would require a regulatory amendment to Section 679 to allow a new gear type for sablefish. USCG staff recommends defining areas by latitude/longitude where the new gear type would be allowed, and not by the 200 fathom contour. Enforcement of Proposal 2 is within the scope of the Joint Enforcement Agreement, it's not currently addressed in the Annual Operations Plan. If this proposal is implemented in regulations, NOAA would likely discuss the issue with Wildlife Troopers and possibly include it in the annual operations plan, as well as rely heavily upon the USCG for enforcement. If the Council recommends that this proposal be analyzed, staff recommends expanding the proposed action to require distinctive marking of buoys by gear type for all groundfish fisheries. This proposal would affect the EEZ only, and would be outside the scope of the joint enforcement agreement with the State of Alaska." An amendment to the GOA Groundfish FMP also would be required.[8]

The *Advisory Panel* concurred with the Team recommendation in February 2010. The AP unanimously recommended that the Council initiate a discussion paper on the use of pots in the GOA and/or SE sablefish fishery and establish a gear committee to identify possible gear conflicts and grounds preemption issues. The motion passed 17:0.

In February 2010 *the Council* adopted the AP motion and identified an extensive list of issues that the paper should discuss. No progress has been made on those issues, although some of the gear issues were previously addressed in the sablefish assessment several years ago.

[8] Current FMP text: Section 3.4.2.1.1.1 Sablefish. Legal gear for the taking of sablefish in any regulatory area of the GOA are trawls and hook-and-lines.

In April 2012, the Council noticed the public of its intent to form a gear committee to advise the Council on next steps, but did not call for nominations or appoint the committee until 2013. Instead, the Council stated that the discussion paper that considered whether to allow IFQ halibut to be retained in sablefish IFQ pots in Area 4A may be informative on allowing the use of sablefish IFQ pots in the GOA[9].

The Council reviewed a preliminary discussion paper in June 2013. It appointed a gear committee which met in September 2013 and provided recommendations to the Council for its consideration in October 2013. This expanded paper resulted from Council consideration of the committee and Advisory Panel report at that meeting.

PREVIOUS FMP AMENDMENTS

Two early GOA Groundfish FMP amendments (#12 (withdrawn) and #14) addressed a pot gear prohibition for sablefish in the GOA. Amendment 12 was adopted by the Council in July 1982. It addressed two potential problems in the Southeast sablefish fishery and proposed to prohibit the use of longline pot gear for sablefish between 140°W longitude and Cape Addington.

1) conservation and restoration of the depressed sablefish fishery; and
2) fishing grounds preemption and wastage of the existing sablefish resource.

Amendment 12 was withdrawn after adoption of Amendment 14, which prohibited the use of all pot gear in the GOA sablefish fishery. That amendment was designed to address excess capacity and grounds preemption problems identified in the fishery. The Council decided that gear and area restrictions and apportionments to gear types would be most effective. It was adopted by the Council in May 1985. NMFS published the proposed rule on July 26, 1985, and a final rule on October 24, 1985, effective November 18, 1985 (50 FR 43193). The purpose and need for that action follows.

> *The sablefish fishery traditionally had been a foreign longline fishery off Alaska, but in the eastern GOA in the early 1980s, domestic longliners had increased their harvests rapidly as markets developed. With improvements in the market for sablefish, two new gear types, pots and sunken gillnets, entered the fishery in 1984. In addition, trawling by foreign joint ventures in the Central and Western Gulf also took sablefish. All these gears created an overcapacity problem in the domestic sablefish fishery, as well as gear conflicts between longliners and pot fishermen.*

1) AREA MANAGEMENT

The 2006 proposal requested that pot gear be allowed in the GOA "southeast" sablefish fishery (interpreted to be the Southeast Outside sablefish regulatory area) (Figure 1). The Council accepted the recommendation from both the IFQ Implementation Committee and Advisory Panel to expand consideration of the gear allowance to the entire GOA since whale depredation on sablefish longline gear was not limited to Southeast Alaska.

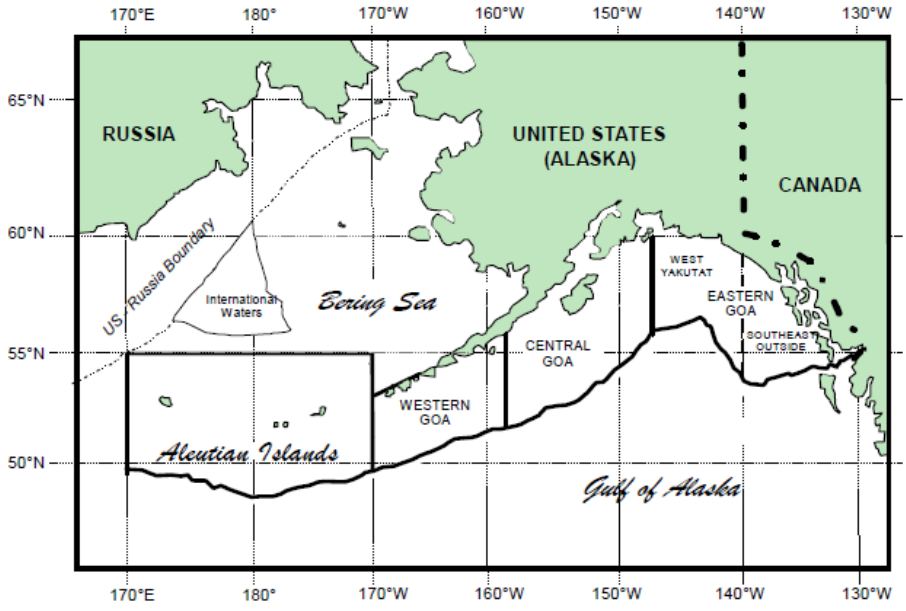

Figure 1. Sablefish Regulatory Areas and Districts

[9] https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/4AhalibutPots_ExpanDP-413.pdf

The committee acknowledged that some sablefish IFQ vessels may be too small to use traditional pot gear, and could result in a competitive disadvantage compared with Western GOA or Central GOA, if the Council were to adopt the proposed action for the entire GOA. It is possible that few IFQ holders could take advantage of the proposed action if it were adopted in Southeast Alaska. See Topic 4a for brief discussion of safety issues related to use of groundfish pots on small vessels.

Note that both single pots and longline pots are allowed, with no restrictions, in the Bering Sea (BS) and Aleutian Islands (AI) sablefish IFQ fisheries. The original IFQ sablefish program allowed both single and longline pot gear in the AI, but only single pots were allowed in the BS until 1997, when longline pots were allowed except in June. A subsequent action allowed both single and longline pots during the entire IFQ season since 2008. The expansion of the use of longline pot gear was intended to prevent killer whale predation of sablefish landed with hook-and-line gear, thus potentially increasing the successful landing of sablefish and decreasing conflict between fishermen and these whales. The June restriction was found to be unnecessary to protect small boat operators and was reversed to increase economic efficiencies for BS sablefish IFQ and CDQ fishermen.

The GOA Sablefish Gear Committee unanimously recommended that the proposed action be adopted for the entire Gulf of Alaska, as whale depredation of sablefish in the IFQ longline fishery is GOA-wide. ***The committee also recommended that issues related to the Southeast sablefish regulatory area be explored***. While Southeast Alaska currently does not have gear conflicts (due to prohibition on the use of trawls and pots), it has several vessel size and bottom topography issues that would affect potential usage of pot gear. These issues include different business plans (smaller, owner/operator fleet) and fishery techniques, habitat issues related to rocky bottoms and corals, smaller boats that may not be able to use pots, remaining hook and line operations that may have more depredation if part of the fleet switches to pot gear. While differences in the Southeast sablefish IFQ fleet may occur, the proposed action would be voluntary; it would not be mandatory. *There may well be a competitive advantage to those that choose to use pot gear in all areas in which pot gear is allowed (including the BSAI)*. That advantage may result from avoiding depredation by whales of sablefish caught in their gear and potential redirection of that depredation onto hook-and-line longline vessels who choose not to invest in pot gear or whose vessels can not safely carry sufficient gear to harvest their IFQs.

2) POT GEAR RESTRICTIONS

A consideration when developing limitations on the use of pot gear in the GOA sablefish IFQ fishery is that a "sablefish pot" is not defined in Federal or State of Alaska regulations; only a generic groundfish pot is defined. Adopting limitations on the use of sablefish pots unique to the GOA sablefish IFQ fishery could incur economic costs to the fleet that also might otherwise use the same gear in other GOA fisheries (i.e., Pacific cod) or in the BSAI where single pots and longline pots is used in those sablefish IFQ fisheries. It could create conflicts between Federal and State regulations that define pot gear.

a. SINGLE VS LONGLINE POTS

As reported in the sablefish stock assessment chapter[10], pot fishing for sablefish has increased in the BSAI as a response to depredation of longline catches by killer whales. In 2000 the pot fishery accounted for less than ten percent of the fixed gear sablefish catch in the BSAI. Since 2004, pot gear has accounted for over half of the BS fixed gear IFQ catch and up to 34% of the AI catch.

Harvest data cannot be distinguished between single pots and longline pots. Separate gear codes for single pots and longline pots to address unique management issues have not been developed. Federal regulations define pot gear for all groundfish (i.e., there is no distinction between pot gear for different species, e.g., Pacific cod or sablefish) at 679.2 Definitions (15) Pot gear means 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:

[10] http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIsablefish.pdf

(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).

(16) Pot-and-line gear means a stationary, buoyed line with a single pot attached, or the taking of fish by means of such a device.

The GOA Sablefish Gear Committee unanimously recommended that the proposed action be considered for longline pot only (and continue prohibition on single pots). The committee further recommended neutrally buoyant line floating groundline (less likely to be stuck on bottom) gear. This gear is an automatic choice by the western sablefish longline pot fleet so this recommendation was not intended to be a requirement in Federal regulations. The committee noted the benefits of using longline pots vs single pots to maximize fishing efficiency and exvessel value of the fishery. Single pots are heavy and their deployment results in lost gear and ghost fishing. Use of single pots creates more gear conflict from increased number of buoys; longline pot gear has a single, straight line of gear in the water which assists other vessels to determine where gear is located. Single pots make it more challenging to prevent getting tangled in another vessel's gear. Their use could result in increased whale interactions with the gear, some of which are protected under the Endangered Species Act and Marine Mammal Protection Act). Longline pots are lighter. Longline strings worth $10-12K can be parted and rejoined if they get wrapped up with other gear. Handling of lighter longline pots enhances crew safety, particularly for smaller vessels.

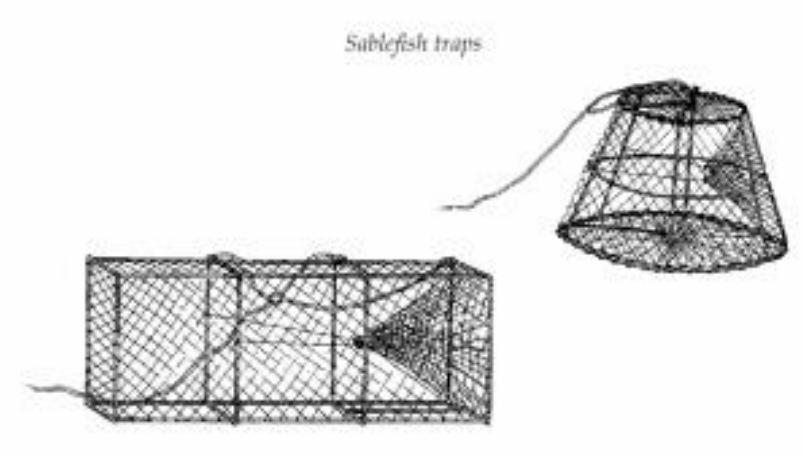

Figure 2. General pot configurations.

Sablefish can be caught with conical pots (also called traps), a trapezoidal or rectangular pot, or a converted crab pot (Figure 2). Conical traps were superior to rectangular pots in handling and workability at sea Clausen and Fujioka 1985). Gear includes a hydraulic block or line hauler, an overhead hoist for lifting pots, and large buoys and flag poles. Reels are used to hold ground line if the line is not coiled on deck or in the hold. Pots are baited with hake or squid. The pots are run on a longline system with up to 50 pots attached to each line. The lines are set in water depths of 200 to 600 fathoms and are weighted at each end with an anchor. They are marked with surface buoys and flag poles. Sablefish pots have self-destruct panels that are designed to fall apart if the trap is left in the water too long. This keeps the trap from continuing to catch fish if the trap is lost. And fishermen have voluntarily included "escape rings" to allow smaller fish to leave the traps.[11] See Figure 3 through Figure 5 for more pot configurations.

The GOA Sablefish Gear Committee unanimously recommended that the Council not regulate pot configuration (i.e., dimensions). Sablefish pot dimensions are not restricted in other areas (BS, AI, British Columbia, northwest US) where they are fished. Doing so would require defining a "sablefish pot" in Federal regulations, distinct from pots used to fish for other groundfish and for sablefish IFQs in state waters. It also could create a conflict with State of Alaska fishing regulations.

[11] http://finecommittee.org/traps/

Figure 3. Old style groundfish pot (Credit: Kurt Cochran)

Figure 4. Most frequently used groundfish pot (Credit: Kurt Cochran)

Figure 5. Newest style of groundfish pot (Credit: Kurt Cochran)

b. POTS RETAINED ON GROUNDS FOR LONG SOAKS VS RETRIEVED DURING DELIVERIES

The following information on pot gear usage in the sablefish fishery from the sablefish chapter in the 2008 GOA Groundfish SAFE Report[12] is provided below.

Catch rates: There is more uncertainty in catch rates from 1999-2004 because there were few observed vessels during this period. From 2005-2007 the average catch rate was 23.8 lbs/pot in the BSAI. However, because there were still relatively few vessels observed in 2005-2007 there was high variability in the average catch rates. Because of the high variability, catch rates within areas were not significantly different between any years in both the observer and logbook data. For both the BSAI, no trend in catch rates is discernible. The composition of species caught in pots in the BSAI was similar in 2005. Sablefish comprised most of the catch by weight (BS = 60%, AI = 69%) and the next most abundant fish by weight was arrowtooth flounder (BS = 13%, AI = 10%). Other species of fish and invertebrates contributed no more than 6% each to the total catch weight.

Spatial and temporal patterns: Seasonal changes in effort were examined in the 2007 SAFE, but no distinct trends were found.

Length frequencies: The authors compared the length frequencies recorded by observers from the 2006-2008 longline and pot fisheries (Figure 6). The average length of sablefish in the BSAI was smaller for sablefish caught by pot gear (63.8 cm) than longline gear (66.0 cm), but the distributions indicate that both fisheries focus primarily on adults. Pot and longline gear is set at similar depths in the BSAI and sex ratio of the catch is 1:1 in both gears. The authors do not believe that the difference in lengths is significant enough to affect population recruitment and did not see any indication that undersized fish were being selected by pots.

[12] http://www.afsc.noaa.gov/refm/docs/2008/sablefishgoa.pdf

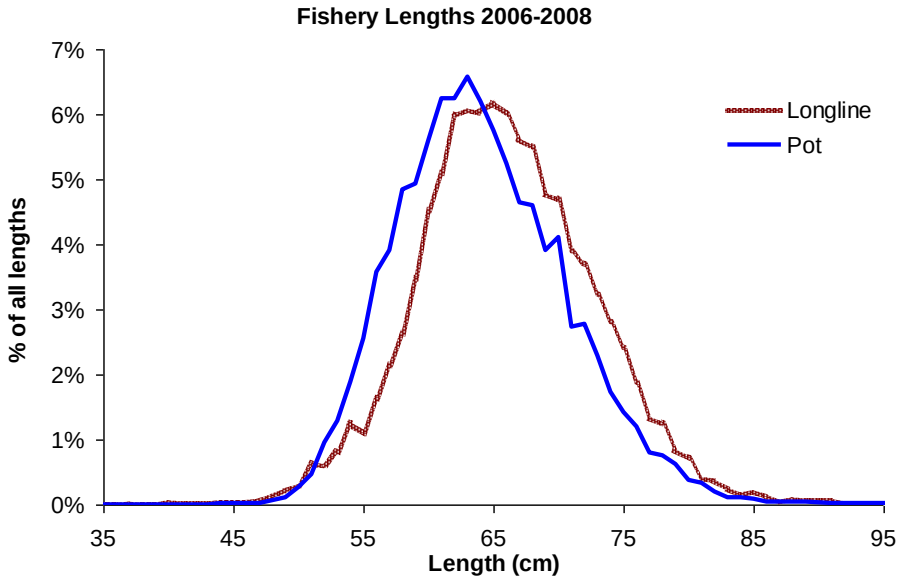

Figure 6. Sablefish lengths for longline and pot gear in commercial IFQ fisheries.

Sablefish diets: In December 2005, the North Pacific Fishery Management Council requested that the AFSC Auke Bay Laboratory scientists investigate a number of issues related to management of the sablefish pot fishery in the BSAI. One concern was the possibility of cannibalism by larger sablefish while in pots. Because few small sablefish are found in pots, there was concern that small sablefish were entering the pots and being cannibalized by larger sablefish.

A total of 257 sablefish stomachs were examined during 2006 and 2007 at sea and in plants in Dutch Harbor, AK. Of these sablefish, 80% were females (attributed to selecting fish greater than 65 cm). A total of 72% of the stomachs sampled were empty. The prey item that occurred most commonly was squid (13%), followed by miscellaneous small prey <15 cm (10%), vertebrae and unidentified digested fish (3%), forage fish (2%), and crab (1%). Some of the squid in the stomachs were noted to be bait from the pots. Miscellaneous small prey included brittle stars and unidentified small prey. The frequency of prey occurrence (out of 257 stomachs) is detailed in Figure 7.

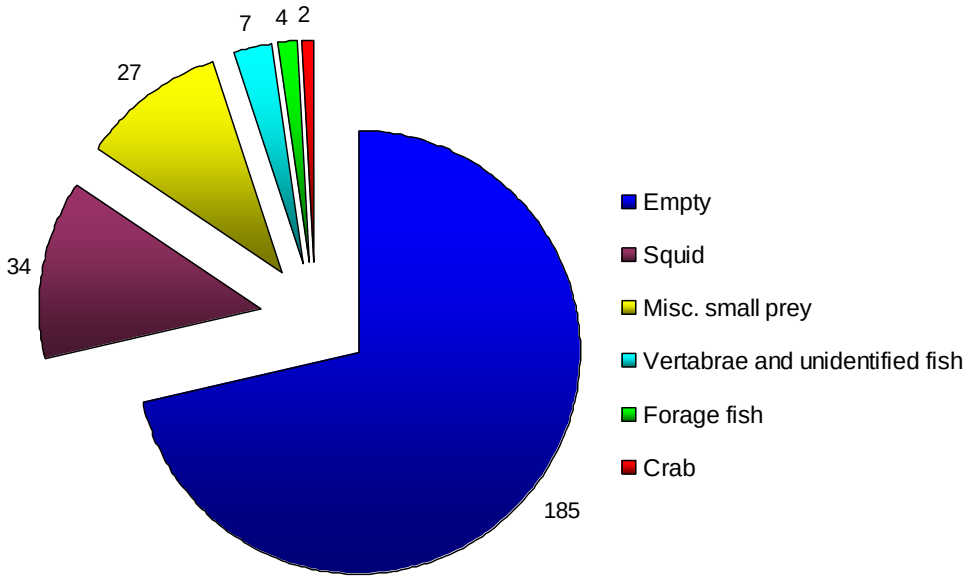

Figure 7. Stomach contents of sablefish samples in 2006 and 2007, Dutch Harbor.

No sablefish were found in the stomachs of large pot-caught sablefish. Several caveats exist to these results. The authors were not provided with the soak time of these pots, so it is possible some of the vertebrae were from digested sablefish. However, sablefish in a benthic environment would likely be at least 35 cm (age 2+) and would take some time to digest to the point of becoming unidentifiable vertebrae. In addition, some stomach contents may have been regurgitated when the pots were retrieved. However, because no sablefish were present in the stomach samples, cannibalism in pots either does not occur or is a rare event.

The GOA Sablefish Gear Committee recommended that the Council adopt a management approach to allow longline pot gear in the GOA sablefish IFQ fishery that minimizes preemption of fishing grounds. Action to require gear removal creates a lot of problems but also has benefits. Issues supporting gear removal include: 1) those that fish the line between areas could dominate the fishing grounds by leaving their gear in the water; 2) pot gear is expensive so fishermen likely would want to remove them off the grounds at the end of a trip; and 3) it would maximize regulatory efficiency by requiring gear to be removed at end of the trip before delivery.

The committee expressed concern about fairness to smaller vessels regarding their inability to carry as many pot longlines as larger vessels (for safety reasons); it may take them three trips to carry all their gear to the grounds. The committee discussed the possibility of voluntary cooperation for stowing gear on the grounds through reporting to the cooperative SeaState program. The committee considered creation of a gear storage corridor to minimize gear conflicts.

The GOA Sablefish Gear Committee recommended that the Council consider removal of pots from fishing grounds at the end of a trip, with some type of enforcement waiver that could be requested to account for weather and safety issues; there was not a consensus on this recommendation.

Overall longline gear is more effective (higher CPUE) due to regular spacing of hooks the v pot "bait bombs" every 50 fathoms. The committee noted that use of pot longline gear has more problems in areas where there is less incentive to use them (in westward areas with lower CPUE and longer soak times than in eastern areas). There are fewer problems with grounds preemption in larger fishing areas (e.g., WGOA).

c. POT STORAGE

Pot storage areas currently are permitted in state waters only; there are no state regulations permitting pot storage in Southeast Alaska (action would be required by the Board of Fisheries to allow it there). State regulatory text follows for areas in which pot storage is allowed in state waters.

5 AAC 28.232. Groundfish pot storage requirements for Prince William Sound Area

(a) Following the closure of a parallel season, all groundfish pot gear must be removed from the water, except as specified in (b) of this section.

(b) The owner or operator of a vessel that is registered for a state-waters season for Pacific cod described in 5 AAC 28.267 may store groundfish pots as follows:

(1) rectangular groundfish pots must have all bait and bait containers removed and all doors secured fully open, and cone or pyramid groundfish pots must have all bait and bait containers removed and all doors not secured closed;

(2) pots must be stored in waters not more than 25 fathoms deep and may be stored only on the north side of Montague Island between 147ø 25.00' W. long. and 147ø 35.00' W. long.; and

(3) pots may be stored only from 10 days before the scheduled opening of the state-waters season until 10 days following the closure of that fishery.

5 AAC 28.332. Groundfish pot storage requirements for Cook Inlet Area

(a) Except as specified in (b) of this section, following the closure of a parallel season defined in 5 AAC 28.081(c) (3), pot gear may be stored in the water as follows:

(1) rectangular groundfish pots must have all bait and bait containers removed and all doors secured fully open; and

(2) cone or pyramid groundfish pots must have all bait and bait containers removed and doors not secured closed.

(b) All groundfish pots must be removed from the water no later than five days after the closure of a season.

5 AAC 28.432. Groundfish pot storage requirements for Kodiak Area

(a) Rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters not more than 25 fathoms deep.

(b) Following the closure of a parallel season or state-waters season for Pacific cod, all groundfish pot gear used by a vessel registered to fish Pacific cod must be removed from the water, except that

(1) rectangular groundfish pots may be stored as described in (a) of this section; or

(2) rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters more than 25 fathoms deep for seven days following the closure.

5 AAC 28.532. Groundfish pot storage requirements for Chignik Area

(a) Except as specified in (c) of this section, rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in water not more than 25 fathoms deep.

(b) Following the closure of a parallel season or state-waters season for Pacific cod, all groundfish pot gear used by a vessel registered to fish Pacific cod must be removed from the water, except that

(1) rectangular groundfish pots may be stored as described in (a) of this section; or

(2) rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters more than 25 fathoms deep for seven days following the closure.

(c) During the seven days before the opening of the state-waters season for Pacific cod in the Chignik Area, rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters more than 25 fathoms deep.

5 AAC 28.571. Groundfish pot storage requirements for South Alaska Peninsula Area

(a) Rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters not more than 25 fathoms deep.

(b) Following the closure of a parallel season or state-waters season for Pacific cod, all groundfish pot gear used by a vessel registered to fish Pacific cod must be removed from the water, except that

(1) rectangular groundfish pots may be stored as described in (a) of this section; or

(2) rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters more than 25 fathoms deep for seven days following the closure; however, groundfish pots may be stored longer than seven days until the season is opened, if the season opening for the Pacific cod state-waters season is delayed as described in 5 AAC 28.577(l) .

5 AAC 28.632. Groundfish pot storage requirements for Bering Sea-Aleutian Islands Area

(a) Rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters not more than 25 fathoms deep.

(b) Following the closure of a parallel season or state-waters season for groundfish, all groundfish pot gear used by a vessel registered to fish for groundfish must be removed from the water, except that

(1) rectangular and cone or pyramid groundfish pots may be stored as described in (a) of this section; or

(2) rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters more than 25 fathoms deep for seven days following the closure.

5 AAC 28.732. Groundfish pot storage requirements for Chukchi-Beaufort Area

Rectangular groundfish pots with all bait and bait containers removed and with all doors secured fully open, and cone or pyramid groundfish pots with all bait and bait containers removed and all doors not secured closed may be stored in waters not more than 25 fathoms deep.

The GOA Sablefish Gear Committee unanimously recommended that <u>if</u> pot storage is limited to state waters, then vessels might as well bring gear to port. If pot storage areas are desired in Federal waters, pot storage grounds would be delineated by latitude/longitude, following guidance from enforcement agencies.

d. GEAR CONFIGURATION REQUIREMENTS

The GOA Sablefish Gear Committee unanimously recommended that the Council require marking of both ends of sablefish pot longlines. Such an action either would affect all groundfish pots, as there currently is not a specific definition of a "sablefish pot" in Federal regulations or would create such a definition, with only this requirement unique to it. If the Council chooses to pursue this committee recommendation, staff requests that the Council clarify whether the requirement would apply only to sablefish pots (and remain within this regulatory amendment package) or be split off into a separate regulatory amendment package to apply to all groundfish pots. The Council also could take no action at this time.

e. GEAR CONFLICTS/ BETWEEN ALL GEAR TYPES

The issue of gear conflicts was controversial in the 1980s and led to the current prohibition on the use of pot gear in the GOA sablefish fixed gear fishery, but gear and fishing effort is distributed to a much greater degree in space and time over the eight month long season with implementation of the sablefish IFQ program when compared to the derby fishery.

Gear conflict is not specific to pot longlines vs hook-and-line longlines. The same degree of gear conflict exists whether the longline deploys hooks or pots; the gear conflict results from the footprint of the groundline and not the pots themselves. This issue also may be described as gear competition between vessels with two similar fixed gear deployment methods fishing the same species. Deployment of longline pots would result in less gear conflict than singe pots because the strings are easier to identify by other vessels, as reported by the committee.

The committee noted that time/area allowances of longline pot gear potentially would reduce gear conflicts. Seasonality of whale depredation occurs May- Aug but there was no support for limiting time or rolling closures on the use of pot gear. The committee felt that gear conflicts would be minimized by requiring longline pot retrieval from fishing grounds at the end of a fishing trip, if removal of pot gear was required. The Council also could consider seasonal and area restrictions.

The GOA Sablefish Gear Committee recommended that the Council consider removal of pots from fishing grounds at the end of a trip, with some type of enforcement waiver that could be requested to account for weather and safety issues; there was not a consensus on this recommendation. Gear

removal would eliminate dead loss. The committee noted that smaller vessels could be allowed to leave pots on the grounds in order to be competitive with larger boats.

The committee discussed the situation of vessel stability and carrying pots in the western GOA. People are not going to modify their vessel to longline pots without a stability report. Following the meeting, a committee member reported that stability likely would be a big problem with mandatory removal of longline pot gear from fishing grounds when delivering. Even with a 58 ft vessel that was built for pot fishing, his stability report requires that the vessel has to be tanked in order to carry pots. He reported that he would have to do 5-7 day trips fishing longline pots to obtain profitable catches. The sablefish would be dressed and iced and the boat will not be tanked. He questioned how he would get pots on board to take in for delivery. He reported that this issue would be problematic for many in the fleet and strongly urged consideration of some options to allow gear to remain on grounds when actively fishing, for safety reasons and fishing efficiencies.

Possible approaches to allow certain vessels to leave sablefish pots unattended on the fishing grounds include, but are not limited to, the following. These provisions however do not assist smaller vessels that might require multiple trips to deploy an amount of longline pot gear that would catch an amount of sablefish IFQs equivalent to hook-and-line longline gear.

- require removal of pot longline gear unless sufficient amount of IFQs associated with the vessel remain.

  A provision to allow pots to be left on the grounds when not being fished may create an unintended loophole for removing gear unless an effective amount is identified (e.g., 10% of vessel owner's IFQ holdings may be an adequate enough incentive to make sure pots are hauled after a vessel is done fishing, as pots are expensive to replace).

- require delivery within X days of deploying pot longline gear.

  Specifying a maximum number of days for when sablefish IFQs must be delivered after longline pot gear is deployed may be well intentioned to limit untended gear. Such a requirement however may be difficult to enforce as it would require knowledge of when gear is deployed. It could require notice to NMFS OLE of when pots are deployed or after the effect enforcement based on notice and delivery reports.

f. USE THE 200 FATHOM DEPTH CONTOUR TO MARK OPEN AREAS

The rationale for using the 200 fathom contour to regulate fishing gear in the sablefish IFQ fishery has not been clearly articulated. An interagency staff group recommended against using depth contour for regulating the fishery, instead agency staff recommended using latitude and longitude. A map of the 200 fathom depth contour is presented under (Figure 8).

The GOA Sablefish Gear Committee unanimously recommended not considering the 200 fathom line as part of this action as no benefit could be identified to this approach. Enforcement agencies also recommended against this approach.

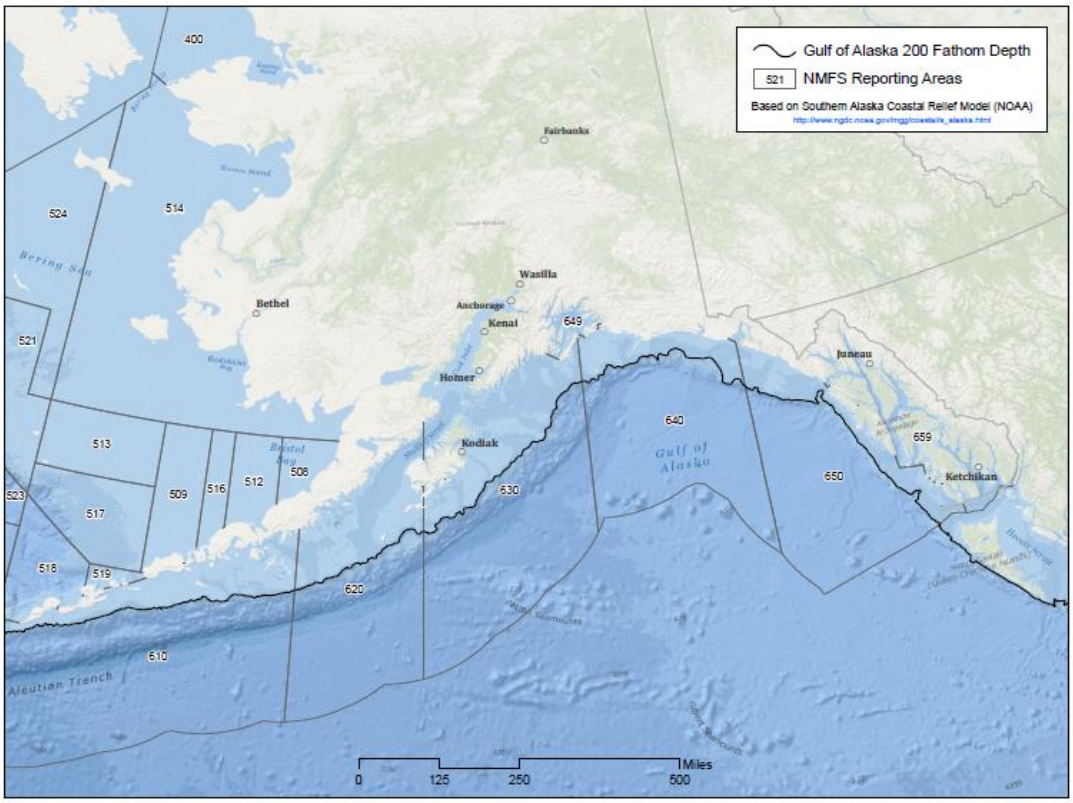

Figure 8. Gulf of Alaska 200 fathom contour line (Source: AKFIN).

g. POT SOAK TIME

The issue of pot soak time was addressed under item b. above. ***The GOA Sablefish Gear Committee recommended not implementing pot soak limits, given its earlier discussion to remove longline pot gear from fishing grounds when not in use, thus automatically limiting soak time by requiring pot retrieval. The committee observed that soak times cannot be enforced.***

Overall longline gear is more effective (higher CPUE) due to regular spacing of hooks the v pot "bait bombs" every 50 fathoms. The committee noted that use of longline pot gear has more problems in areas where there is less incentive to use them (in westward areas with lower CPUE and longer soak times than in eastern areas). There are fewer problems with grounds preemption in larger fishing areas (e.g., WGOA).

In 2006, some questions were raised about storing pots at sea, escape rings and biodegradable panels. While the authors have not analyzed the consequences of these potential regulatory issues, in 2006 the authors examined the soak times of the observed pot sets. These are plotted below:

In an experiment examining escape mechanisms for Canadian sablefish, Scarsbrook et al. (1988) showed that in their control traps fish had only 5% mortality up to 10 days; for the BS/AI pot fishery , 90% of the pot sets were soaked for 7 days or fewer (Figure 9).

Pot sample sizes: Sablefish pot fishing has increased dramatically in the BS and AI since 1999. In 2007, pot gear accounted for 81% of the BS fixed gear IFQ catch and 56% of the AI catch. Fishery catch and effort data for pot gear are available from observer data since 1999; however, due to confidentiality agreements, the authors cannot present these data due to low sample sizes. Pot fishery data are also available from logbooks since 2004; however, these data are also sparse. The number of observed sets and the number of pots fished increased dramatically in 2005 and remained high through 2007. The number of logbook pot sets has continued to increase in the BS and has stayed consistent in the AI. Over all years, the average number of pots used per set was 78.

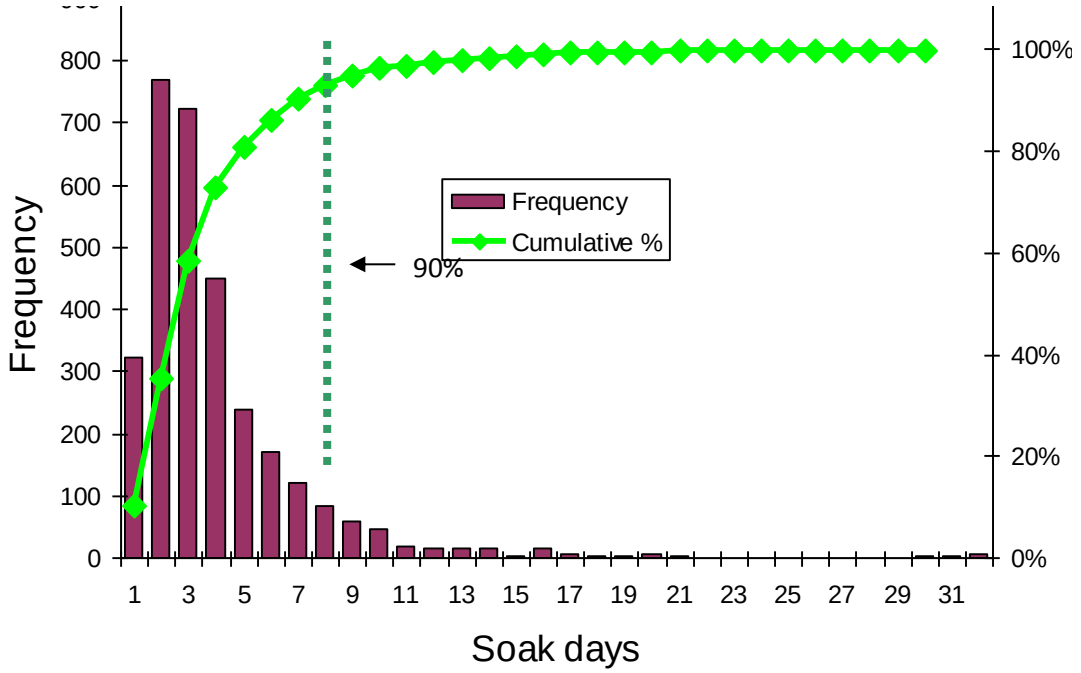

Figure 9. Number of soak days for 1999-2005 BSAI pot fisheries.

h. PRE-EMPTION OF FISHING GROUNDS DUE TO LOST GEAR

The GOA Sablefish Gear Committee recommended only longline pot gear be added as legal fishing gear to the GOA sablefish IFQ fishery and requiring gear to be removed from fishing grounds when not being fished, *partly to minimize lost gear and ghost fishing****. The committee also recommended voluntary reporting of lost gear through a third party, perhaps Sea Grant, despite there being a strong incentive to retrieve expensive gear***. The industry generally knows of locations of abandoned longline gear so mandatory reporting was not recommended.

i. COST OF GEAR CONVERSION FROM LONGLINE TO POT GEAR

Several committee members provided estimates of purchasing longline pot gear to replace their hook-and-line longline gear. One committee member reported that a two mile string of longline pot gear with buoy line costs $4,500, while 6 strings cost $27,000. A two mile string of longline pots and line (50 pots) costs $25,000. If the Council recommended a 300 pot limit (on 6 strings) it could cost approximately $150,000 for the gear, if purchased new. Additional costs include piston block, line bin and cut out stern costing perhaps another $50,000 - $60,000. These costs would be voluntary and not required as the proposed action is to allow, *not require*, longline pots as legal gear in the GOA sablefish IFQ fishery. These (voluntary) expenses were incurred by all vessel owners who converted from longline to longline pot gear in the sablefish IFQ fishery in the BS and AI (and BC and west coast). None of these costs were mandatory. These fishermen independently determined that these expenses were warranted.

Another estimate was provided, as follows. A typical longline set for one operation is 3 nautical miles. He uses 3 sets in the water, 30 skates to a set, and hauls the pots daily. Pots are typically set 50 fathoms apart (300'), so 60 pots on a longline string would be equivalent to a hook-and-line longline set. He would need 180 pots in three strings to cover the same fishing ground that is covered with longline gear. At times fishing operations are 24-h with 5 sets hauled each day. He figures 60 pots times 5 hauls is 300 pots, the maximum recommended by the committee (see item m. below). Up to 300 pots would give fishermen enough flexibility to operate as efficiently as possible without occupying too much of the fishing grounds. Some fishermen operate with 150 pots. He estimates a 150 pot string would cost approximately $100,000; $35,000 for the pots and shackles, $40,000 for the hauler and hydraulics and $25,000 for ground line. This is just approximate and depends on what equipment is already on the vessel. Most longliners also would have to update their hydraulic gear. This compares with a string of hook-and-line longline gear that

costs about $100,000. 150 skates of auto line gear with swivels cost $415 each. Adding the anchors, buoys, and flag poles plus spares comprise the remainder of the $100,000 estimate.

A third estimate of the cost of a sablefish pot from a pot maker in Washington was $216 per pot. A recent price for a complete skate of gear is $230. For 150 pots, it could cost $60,000 for gear, including mainline, with C links and gangions. Rigging up for hook-and-line longlining could cost approximately $35,000 for 100 skates of gear, which would be comparable to 150 longline pots.

j. VESSEL DEMOGRAPHICS: VESSEL SIZE BY AREA AND QUOTA SHARE SIZE BY AREA

The Council requested vessel demographic information to determine if there are unique characteristics of the fleet that it should address in its decision making. Some commenters have proposed special consideration of the small boat fleet in Southeast Alaska that may not be able to safely deploy an amount of pots that would be comparable to the catching efficiency of their hook-and-line longline gear. A concern is that if certain vessels opt not to convert to longline pot gear, they could face economic competition, as well as be a remaining target for whale depredation.

The NMFS RAM database was explored for each year during 2004 through 2012 by vessel category and area (Table 1). For each regulatory area, the number of vessels by vessel category that made sablefish IFQ landings is reported in the first table below. On average total landings in the SE regulatory area by category B vessels was 647 mt, and by category C vessels was 2,237 mt. Table 2 reports the number of sablefish QS holders by size of IFQ holdings and their associated harvest. On average total landings in the SE regulatory area by 36 IFQ holders with <1,000 lbs. was 62 mt, by 58 IFQ holders with 1,000 to 5,000 lbs. was 3 mt, by 66 IFQ holders with 5,000 to 10,000 lbs. was 19 mt, and by 192 IFQ holders with >10,000 lbs. was 736 mt.

Table 1 Sablefish IFQ vessel count (number) and weight (metric ton) posted by vessel category.

Metric Tons		AI		BS		CG		SE		WG		WY	
Year	Vessel Category	Vessel Count	Catch	Vessel Count	Catch	Vessel Count	Catch	Vessel Count	Catch	Vessel Count	Catch	Vessel Count	Catch
2004	A	19	587	16	209	30	903	28	337	21	832	15	174
	B	21	298	18	253	101	2,746	43	757	47	904	69	1,355
	C	5	59	10	61	112	2,115	200	2,611	26	390	81	681
2005	A	19	542	20	259	32	891	28	329	17	791	14	189
	B	19	343	18	235	96	2,725	44	719	50	783	70	1,378
	C	4	61	14	63	115	2,096	185	2,486	28	323	76	693
2006	A	16	414	19	349	31	791	30	325	21	777	14	159
	B	16	202	22	301	100	2,409	42	719	47	893	71	1,191
	C	7	83	8	77	116	1,846	178	2,451	31	373	73	619
2007	A	12	414	17	406	34	767	30	315	19	731	18	163
	B	14	273	15	315	101	2,352	45	676	45	811	71	1,208
	C	7	42	14	82	112	1,799	173	2,342	31	313	76	619
2008	A	14	409	17	325	36	578	28	285	18	446	19	139
	B	18	191	17	281	91	2,101	48	657	42	628	68	1,122
	C	9	44	15	77	107	1,580	168	2,251	28	267	66	566
2009	A	20	443	20	312	36	621	27	254	21	492	17	126
	B	18	275	19	275	98	1,875	51	556	45	556	72	940
	C	7	34	15	87	104	1,464	168	1,939	24	234	67	479
2010	A	18	431	18	177	35	564	30	236	24	495	16	115
	B	19	181	20	242	95	1,710	51	518	45	546	70	852
	C	10	29	12	71	104	1,318	176	1,807	25	216	69	437
2011	A	15	521	21	204	31	592	27	270	23	491	17	139
	B	22	222	21	205	95	1,796	52	594	45	545	64	1,058
	C	7	21	18	69	105	1,361	168	2,055	28	210	70	538
2012	A	13	510	17	189	38	715	29	293	28	502	18	161
	B	17	276	19	219	95	2,136	54	632	42	548	66	1,170
	C	9	33	12	73	109	1,574	167	2,190	24	222	68	589
ave.	A	16	474	18	270	34	714	29	294	21	618	16	152
	B	18	251	19	258	97	2,206	48	647	45	690	69	1,141
	C	7	45	13	73	109	1,684	176	2,237	27	283	72	580

Notes: Catch Weight in Product Amounts

Source: NMFS Alaska Region IFQ, data compiled by AKFIN

Table 2. Sablefish IFQ permit holders (numbers) and catch (mt) by area.

Metric Tons		AI		BS		CG		SE		WG		WY	
Year	Permit Holder Allocation (lbs.)	Permit Holder	Catch	Permit Holder	Catch	Permit Holder	Catch	Permit Holder	Catch	Permit Holder	Catch	Permit Holder	Catch
2004	<1000	5	104	4	22	33	116	44	145	18	186	18	36
	<5000	3	5	5	6	38	43	56	97	9	12	56	87
	<10000	4	9	7	11	37	124	67	232	12	40	45	168
	>10000	32	825	30	484	202	5,481	212	3,229	71	1,890	103	1,919
2005	<1000	5	43	9	44	35	126	40	187	14	139	20	42
	<5000	3	4	6	7	39	50	55	87	9	11	48	72
	<10000	8	32	8	15	37	140	68	253	19	72	46	166
	>10000	30	867	34	490	191	5,396	201	3,006	71	1,677	102	1,979
2006	<1000	3	12	3	69	44	201	34	134	15	184	16	37
	<5000	4	5	6	10	44	53	57	89	10	15	53	89
	<10000	5	13	8	18	41	169	62	212	17	67	41	140
	>10000	32	669	39	632	178	4,626	200	3,059	69	1,778	95	1,703
2007	<1000	1	*	5	40	42	174	37	131	15	110	25	79
	<5000			5	8	48	61	54	87	8	15	49	89
	<10000	4	*	9	53	41	148	64	236	18	64	44	152
	>10000	30	725	32	701	175	4,536	193	2,879	69	1,664	93	1,670
2008	<1000	5	54	9	86	43	113	34	153	12	93	23	50
	<5000	5	11	8	16	40	48	53	95	13	23	43	63
	<10000	5	9	9	18	48	180	59	203	32	114	49	158
	>10000	28	569	34	562	170	3,918	195	2,742	53	1,111	89	1,556
2009	<1000	6	116	9	77	43	88	35	121	9	101	25	31
	<5000	3	5	4	3	53	70	70	128	18	34	57	87
	<10000	8	20	8	13	46	151	65	212	32	107	39	129
	>10000	25	612	33	581	163	3,650	178	2,289	52	1,042	86	1,297
2010	<1000	3	13	6	56	48	78	35	105	13	84	23	12
	<5000	6	6	3	2	58	81	68	107	18	41	64	97
	<10000	8	17	8	28	48	155	71	227	31	104	39	132
	>10000	26	606	32	405	163	3,279	174	2,122	55	1,028	80	1,162
2011	<1000	4	101	6	35	48	80	39	192	10	39	26	46
	<5000	4	5	7	7	54	74	57	93	18	33	47	71
	<10000	10	18	7	14	46	147	69	221	31	115	45	146
	>10000	29	640	35	421	164	3,449	180	2,412	57	1,059	87	1,471
2012	<1000	6	62	4	13	38	130	26	79	8	65	16	7
	<5000	6	3	7	8	50	56	54	92	16	30	45	70
	<10000	9	19	10	39	51	163	71	239	28	101	47	161
	>10000	24	736	27	420	170	4,076	192	2,704	63	1,077	95	1,682
ave.	<1000	4	62	6	62	42	62	36	62	13	62	21	62
	<5000	4	3	6	3	47	3	58	3	13	3	51	3
	<10000	7	19	8	19	44	19	66	19	24	19	44	19
	>10000	28	736	33	736	175	736	192	736	62	736	92	736

Notes: * is Confidential, Catch Weight in Product Amounts

Source: NMFS Alaska Region IFQ, data compiled by AKFIN

A cursory examination of the use of pots in the groundfish (i.e., Pacific cod) fishery by small vessels indicates that 12 vessels with lengths between 30 ft and 44 ft fished with pot gear in the GOA in 2012 (Table 3). Total groundfish harvest in Federal waters was 279,000 mt and in state waters 546,000 mt. The distribution of vessels using groundfish pots (likely to harvest Pacific cod) is shown in Table 2 for 2003 through 2012 by vessel size. There were 11 vessels between 30 ft and 44 ft and 85 vessels between 45 ft and 59 ft from a total of 130 vessels of all sizes during the period (Table 4).

Table 3 Groundfish harvest (mt) by small vessels in the Gulf of Alaska in 2012.

vessel length	harvest in GOA EEZ (mt)	harvest in GOA state waters (mt)
44	3,494	40,550
37	13,958	75,821
37	13,655	58,368
40	46,467	77,757
38	56,025	28,671
42	37,434	4,778
42	0	37,268
42	8,468	89,035
44	62,407	31,668
38	0	17,577
35	0	69,135
36	37,383	15,370
Total	**279,291**	**545,997**

Table 4. Number of groundfish pot vessels in the GOA by vessel size (ft), 2003-2012 (Data compiled by AKFIN).

year	15-29	30-44	45-59	60-74	75-89	90-104	105-119	120-134	135-149	150-165	Total
2003		13	86	4	11	7	8	2	1		132
2004	1	10	86	3	11	17	8	3			139
2005		12	85	3	12	12	11	4			139
2006		13	84	3	10	15	9	3			137
2007	1	8	81	5	11	12	7	2			127
2008		12	85	5	8	10	8	4		1	133
2009		8	83	4	10	10	2			1	118
2010		7	74	3	9	7	4	2			106
2011		15	101	3	8	9	5	1		1	143
2012		12	89	3	8	7	4	1		1	125
average	**0**	**11**	**85**	**4**	**10**	**11**	**7**	**2**	**0**	**0**	**130**

k. BIODEGRADABILITY OF TWINE USED FOR ESCAPE PORTS AT SABLEFISH FISHING DEPTHS

Information was not available on differences of biodegradability of twine used for escape panels at different depths in sablefish pot fisheries. The committee noted that the current "bio twine" appears to work effectively at releasing the trap doors over time, which allows fish to escape if the pot is not retrieved. This issue would not need to be regulated.

l. A WIDER RANGE OF GEAR LOCATION METHODS

The GOA Sablefish Gear Committee unanimously recommended the voluntary communication of longline pot gear location thru Automatic Identification Systems (AIS), which costs approximately $500 per unit, as a potential method to minimize gear conflict where longline pot gear is deployed. Sea-state is currently used by trawl and pot boats in the Bering Sea. Pot boats have to update their gear locations when gear is moved to a new location. Sea state participants would receive the update. This program has resulted in great success between crabbers using pots and groundfish trawlers to eliminate gear conflicts.

A committee member reported that it should be sufficient for vessels fishing with pots to voluntarily notify other vessels fishing around them that they are going to port for delivery along with their pot locations. Vessels entering the grounds usually ask boats in the area where their gear is being fished. The boats already there would relay the location. Setting over pot gear is not that big of a problem; if it occurs the top gear needs to be hauled first. This issue would not need to be regulated.

m. POT LIMITS

The committee noted that vessel capacity would limit the number of pots safely deployed although some large boats would have an unfair advantage. Pot limits could be enforced by observer monitoring. Use of longline pot gear would increase fishing efficiency and allow IFQs to be reached and thereby reduce grounds preemption. Many boats don't have to leave grounds and offload until their hold is full. The committee recommended that the discussion paper examine the use of longline pot gear in the BSAI, west coast, and Canada (examine number of pots, catch per pot, etc.) to identify a fair, equitable, efficient number of pots for all size vessels across the entire GOA (factor in economics (e.g., fuel, etc.)).

The committee discussed a range of 200-400 pots per vessel for the discussion paper. Members also suggested a pot limit per vessel of 6 strings or 2 miles = 12 miles of fishing grounds = 300 maximum number of pots, which would be roughly the same grounds as used by a longliner to start discussion.

3) HALIBUT MORTALITY

The issue of halibut mortality in sablefish pots was explored in an April 2013 expanded discussion paper that considered whether to allow IFQ halibut to be retained in IFQ sablefish pots, where they are allowed in Area 4A (only)[13]. No data is available to determine the amount of halibut that could be caught in sablefish pots under the proposed action because the gear is prohibited in the GOA. Table 5 lists the number of halibut retained in sablefish pots in an area of overlap of IPHC Regulatory Area 4A and the sablefish BS and AI regulatory areas id provided for reference; no comparisons may be drawn from this data for the GOA. Average weight of halibut cannot be determined from fish ticket data because it is believed to provide a less-than-complete accounting and comes without independent verification. The use of observer data could be explored to provide a proxy for average halibut weight to convert from numbers to pounds, but only a small amount of pot fishery data is available from observer and logbook data[14].

Table 5. Number of Area 4A halibut and pounds of BS or AI Sablefish harvested in pot gear, 2009-2012.

Month	Sablefish (round lbs.)	Halibut (numbers)	Halibut (net weight lbs.)**	Percent Total Sablefish (based on lbs.)	Percent Total Halibut (based on numbers)
3	246,978	290	3,770	5.71%	2.18%
4	629,310	1,542	20,046	14.56%	11.59%
5	635,563	8,044	104,572	14.70%	60.46%
6	431,946	1,608	20,904	9.99%	12.09%
7	416,230	1,077	14,001	9.63%	8.10%
8	382,767	92	1,196	8.85%	0.69%
9	586,651	320	4,160	13.57%	2.41%
10	724,100	260	3,380	16.75%	1.95%
11	269,529	71	923	6.23%	0.53%
Total	**4,323,074**	**13,304**	**172,952**		

Notes: *Confidential, Catch Weight in Product Amounts **based on 2011 mean of 13.0 lbs net weight/fish (Source: IPHC)

Source: ADFG/CFEC Fish Tickets, data compiled by AKFIN in Comprehensive_FT

[13] https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/4AhalibutPots_ExpanDP-413.pdf
[14] http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIsablefish.pdf

Sablefish Gear Committee members reported that the pot tunnel size likely will determine how much halibut bycatch occurs, with more, smaller halibut occurring in shallower depths. A committee member suggested that halibut bycatch and overall mortality would be less with pot gear. Pots would catch fewer halibut; and even if the halibut mortality may be higher in pots, the overall mortality would be less. If the IPHC allowed pots as legal gear for halibut for those holding halibut IFQ permits, bycatch and halibut mortality would decrease (see discussion of Area 4A halibut pot proposal before the IPHC in January 2014.

Also pots in the sablefish IFQ fishery use a "sock tunnel" which is very difficult for halibut to push their way through into the pot. One committee member's experience in longlining pots in the Bering Sea sablefish IFQ fishery was that halibut bycatch was minimal, 1 or 2 fish per string. The depth at which longline pots are deployed in the Bering Sea avoids halibut concentrations.

a. EXACERBATION OF HALIBUT MORTALITY

The committee briefly discussed whether additional halibut mortality is associated with pot gear. It observed that halibut mortality could be increased due to increased soak times and concluded that the net change in halibut mortality from switching to longline pot gear would be difficult to quantify. Halibut bycatch in pots is low, and lower than on hook-and-line longlines, based on reports in other sablefish fisheries. The overall effect from switching some fishing effort to pot gear may be to reduce halibut mortality, even though those few fish must be discarded.

b. SHIFTING PREDATION TO HALIBUT

The committee briefly discussed this topic, and concluded that it would be difficult to quantify net changes in increased halibut mortality if whale depredation shifted to the halibut IFQ fishery.

c. HALIBUT RETENTION IN POTS

No studies were found comparing catch rates of Pacific halibut in different types of groundfish pots. Williams et al. (1982) compared catch rates of halibut in several types of crab pot. Top-entry crab pots had substantially lower catch rates of halibut than side-entry pots. "Tanner boards," which are placed horizontally across the upper half of the tunnel opening, reduced the catch rate of halibut by side-entry pots by 63%. In addition, the catch of halibut over 90 cm long was almost eliminated. The authors recommended further gear research to determine if side-entry pots can be modified to significantly reduce halibut loss with little cost.

The committee unanimously recommended that the proposed action include adoption of retention of halibut in sablefish pots by IFQ holders in all regulatory areas. It recognized that consideration of halibut retention in sablefish IFQ pots in all areas was beyond the charge to the committee.

The committee also recommended that information provided in the Area 4A discussion paper be incorporated into the expanded discussion paper.

In April 2013 the Council decided to recommend that the IPHC favorably consider a proposal to allow the retention of halibut in sablefish pots in Area 4A only (Figure 10), provided sufficient IFQs were held to cover their harvests. This would allow sablefish IFQ holders in either the BS area, AI area, or Western GOA area who also hold [sufficient] Area 4A halibut IFQ to retain halibut when using pot (single or longline) gear. The IPHC is scheduled to consider the Council recommendation during its January 2014 Annual Meeting. A complementary action would be required to revise legal gear for Pacific halibut in Federal regulations, therefore even if adopted by the IPHC, the earliest the change might be in effect may be 2015. Also, the Council indicated an interest in considering additional regulatory amendments, such as a maximum retainable allowance in sablefish pots.

Spatial distribution of halibut and sablefish harvest in affected area Figure 11 (percent) and Figure 12 (number) show the distribution of IFQ sablefish pot landings (blocks) with halibut bycatch (vertical bars) summed over four years (2009-2012). The highest amounts in percent and numbers of both sabelfish and halibut catch appears closest to the port of Dutch Harbor. Figures 13 through 21 show the relationship between sabelfish pot landings, and halibut bycatch, by month in the IFQ season.

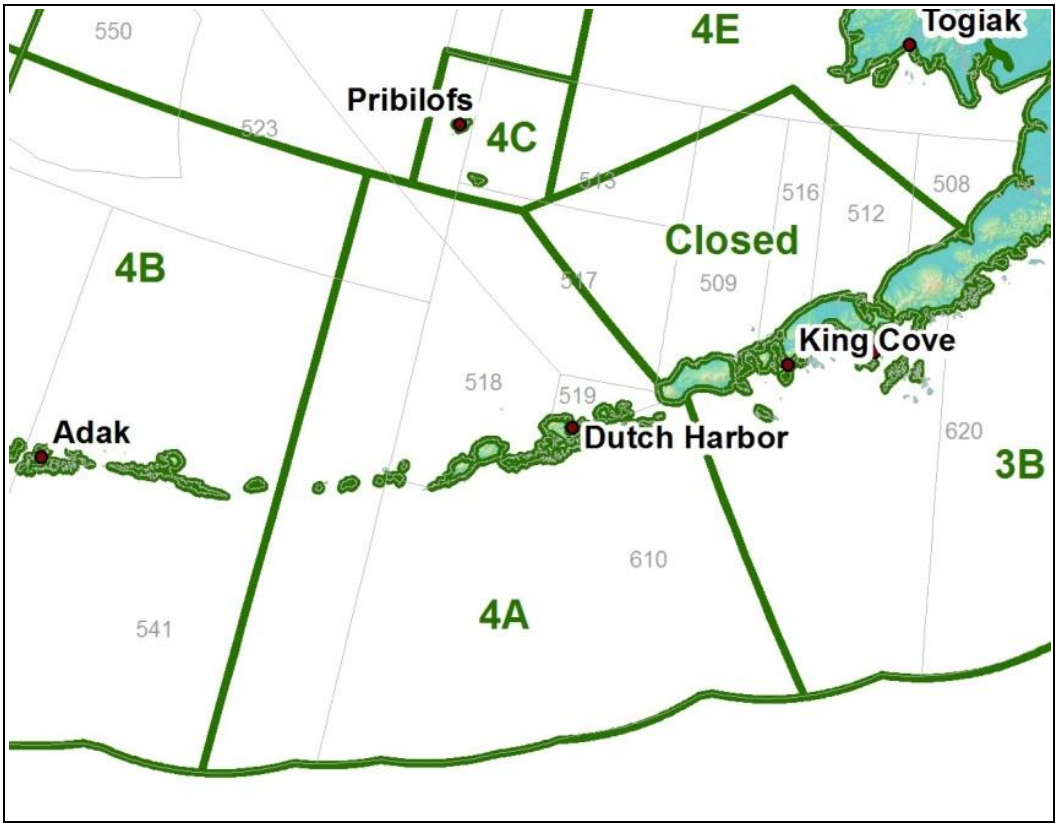

Figure 10. Overlap of IPHC halibut regulatory areas with BSAI groundfish (sablefish) regulatory areas (Source: NMFS). Area 4A overlays 630 (WG), 541 (AI) and multiple BS areas

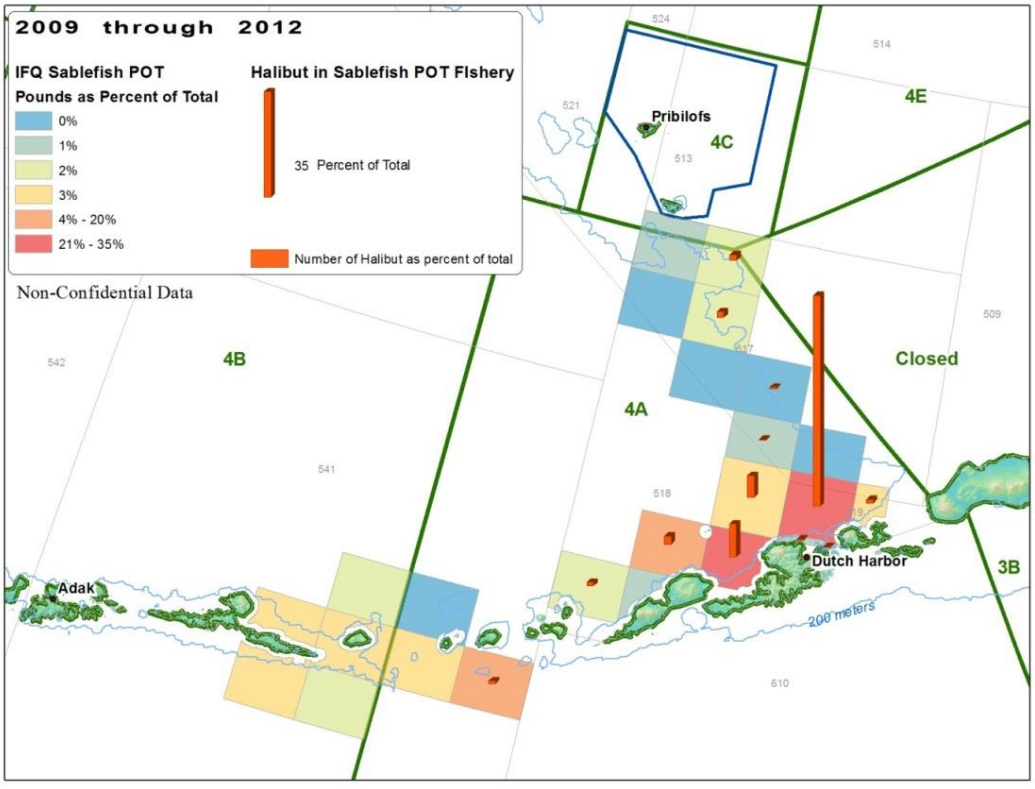

Figure 11 Number of halibut as a percent of total (summed over 2009-2012) halibut caught incidentally in IFQ sablefish fishery in pot gear.

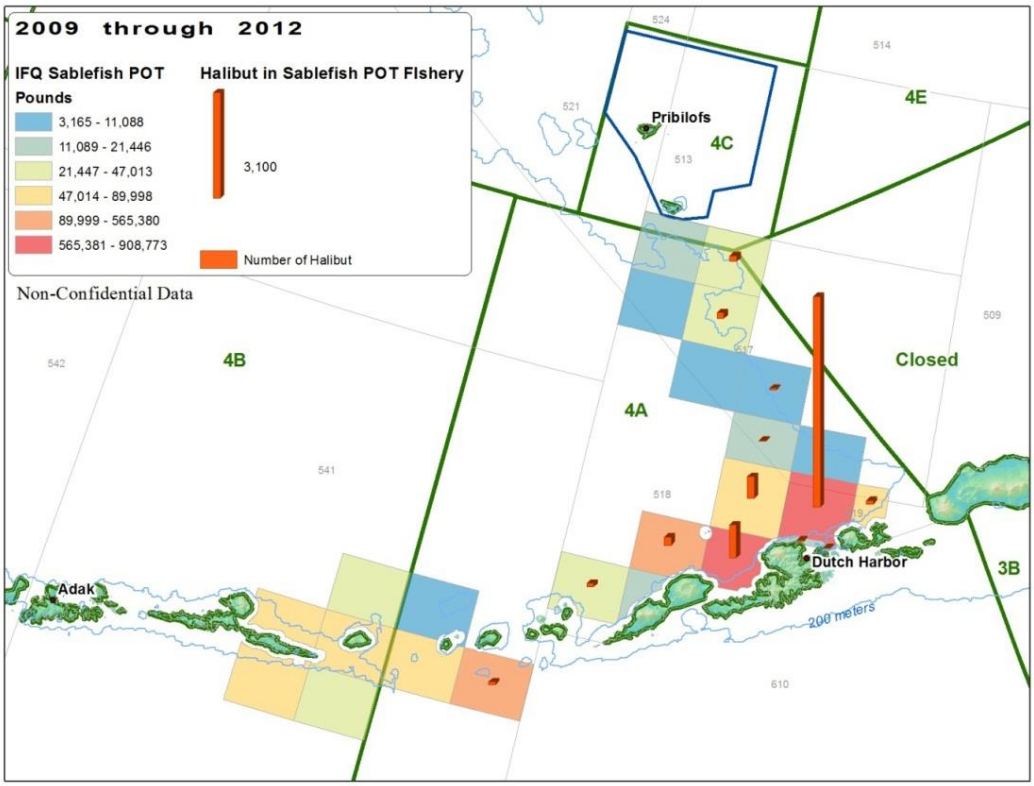

Figure 12 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear.

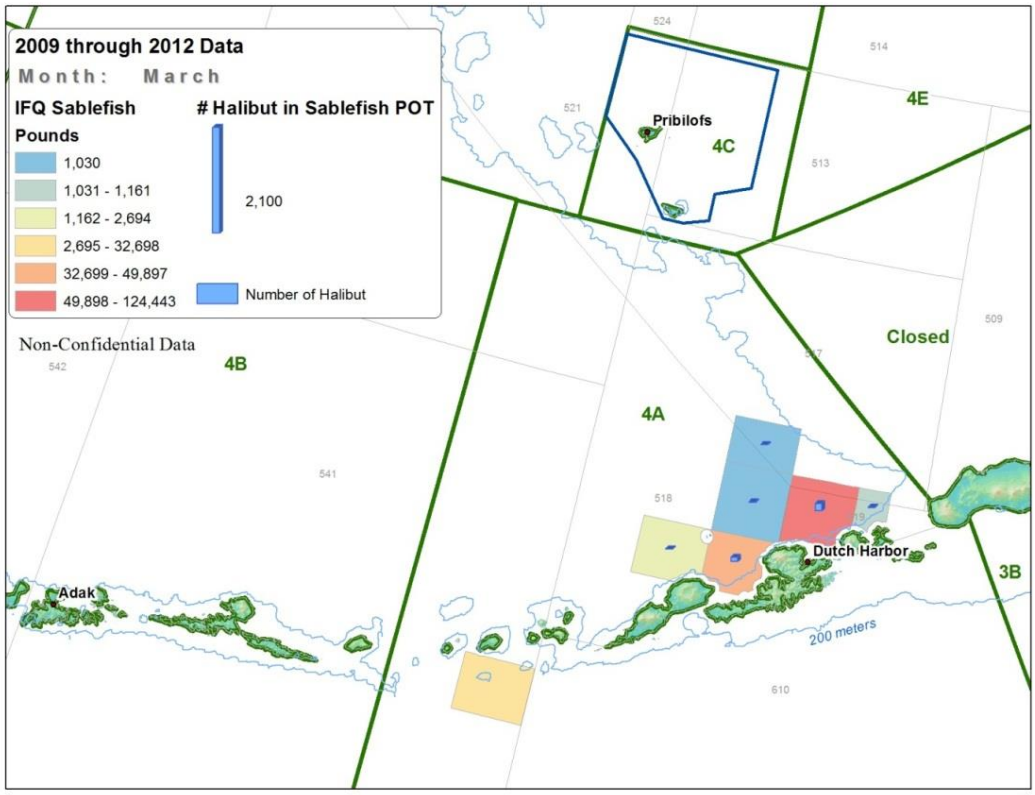

Figure 13 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

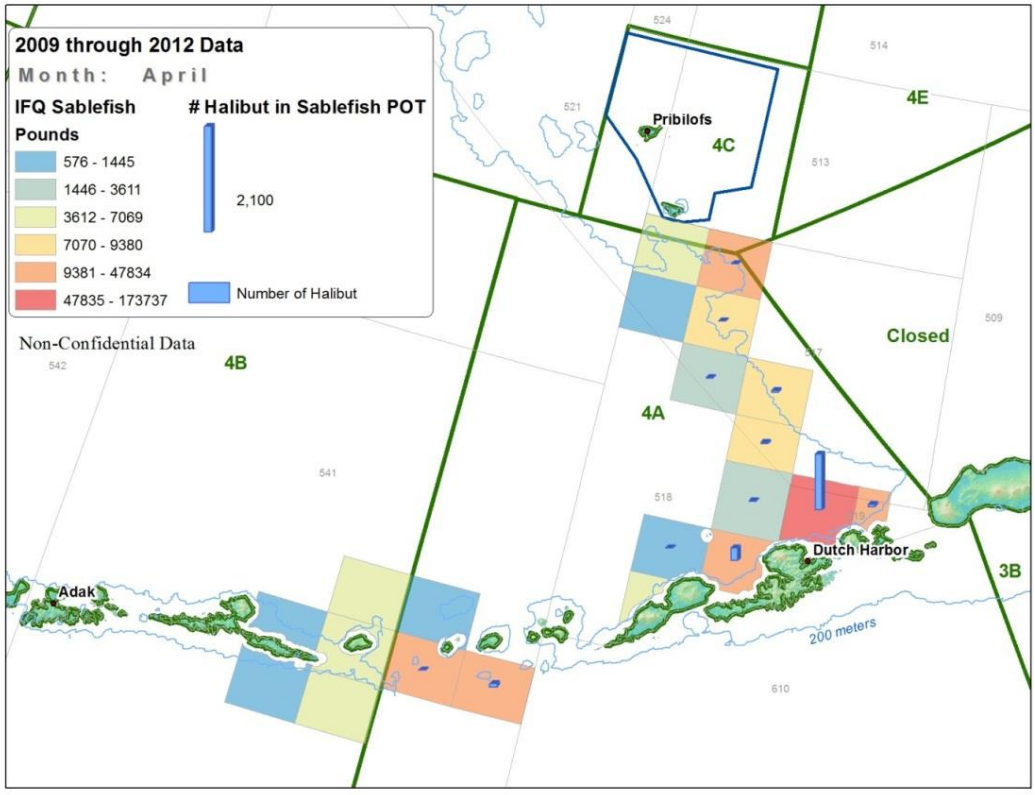

Figure 14 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

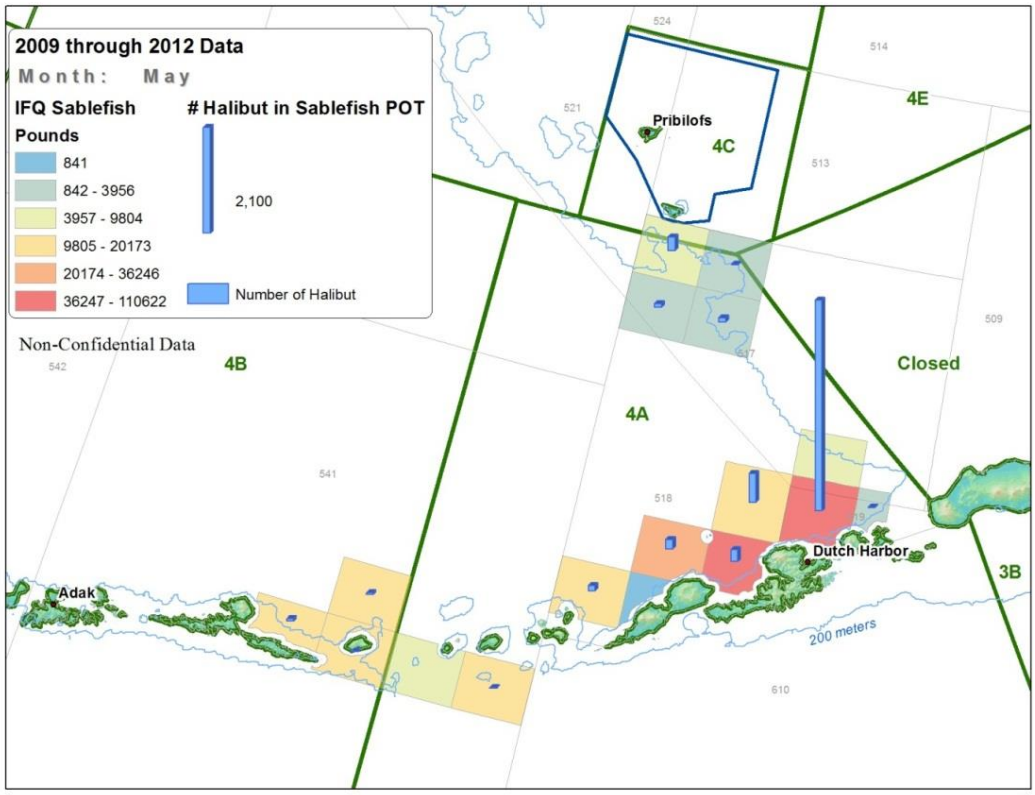

Figure 15 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

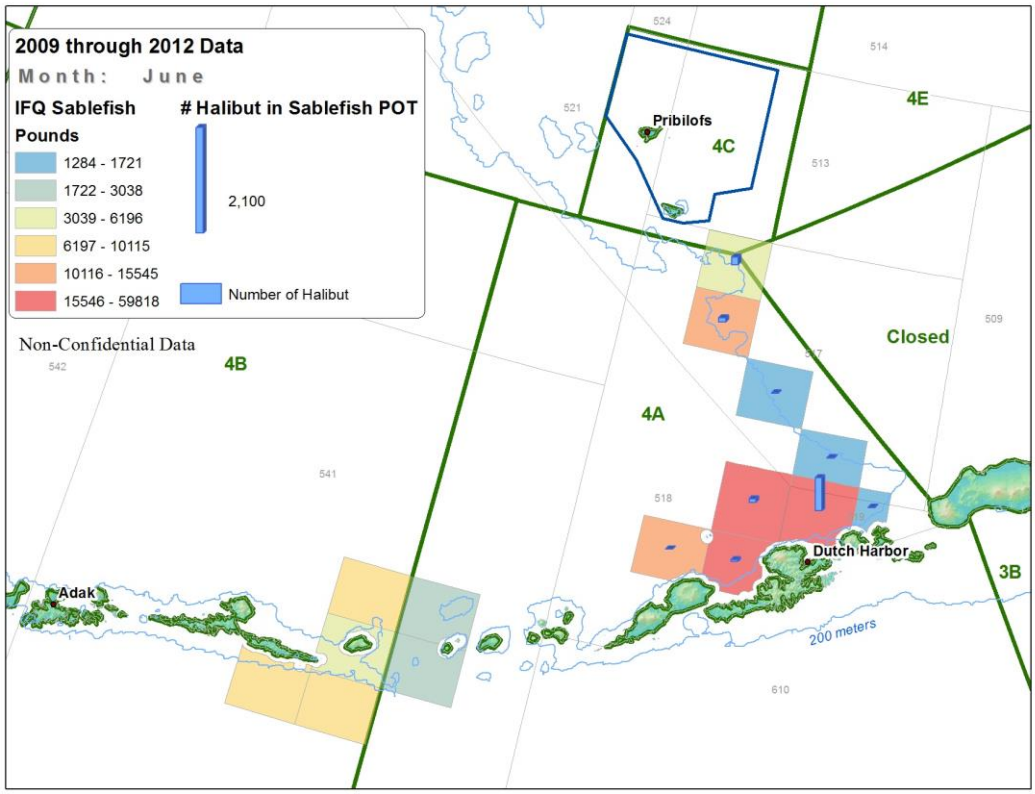

Figure 16 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

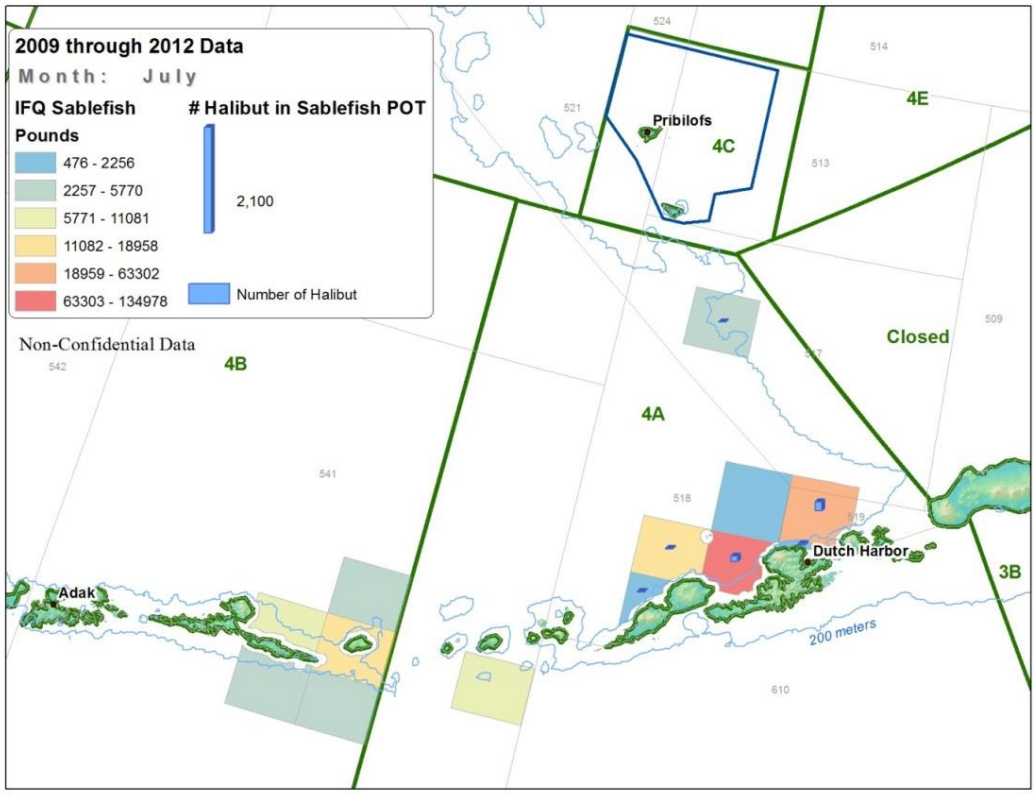

Figure 17 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

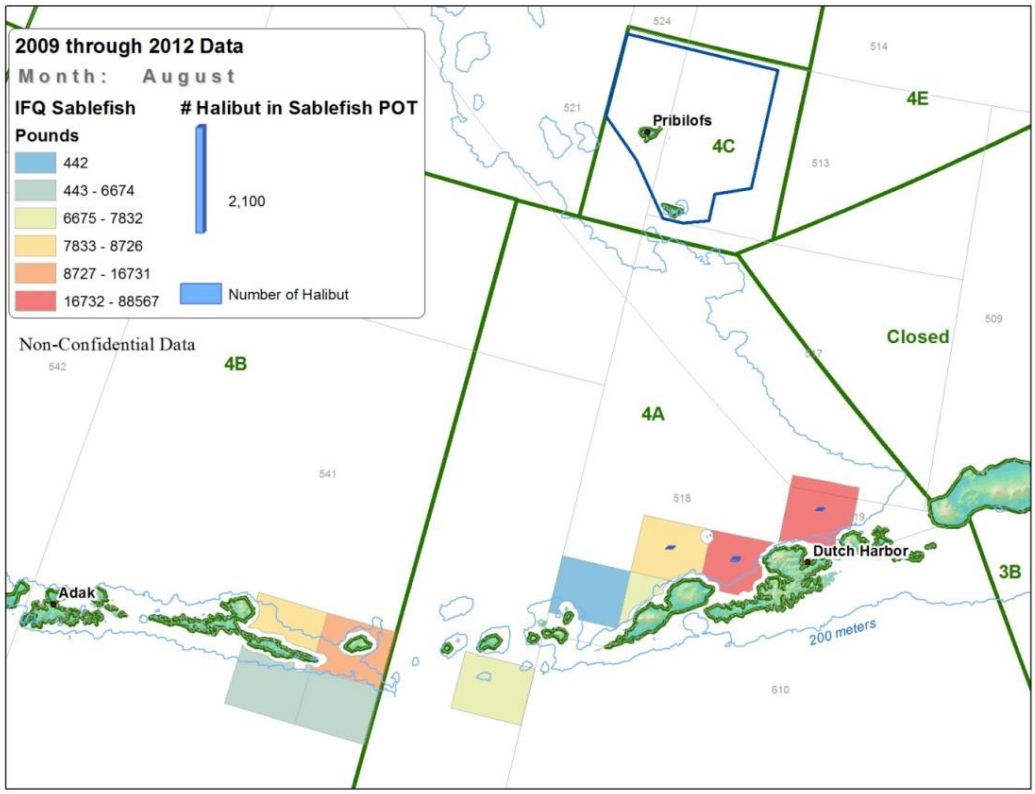

Figure 18 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

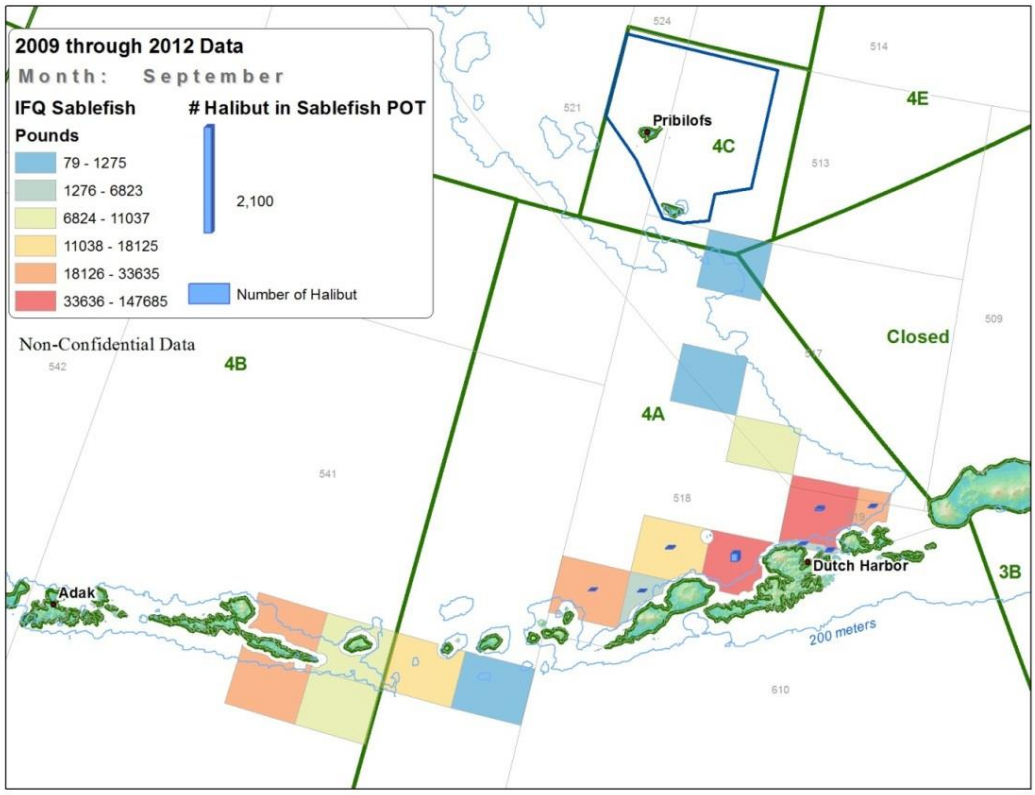

Figure 19 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

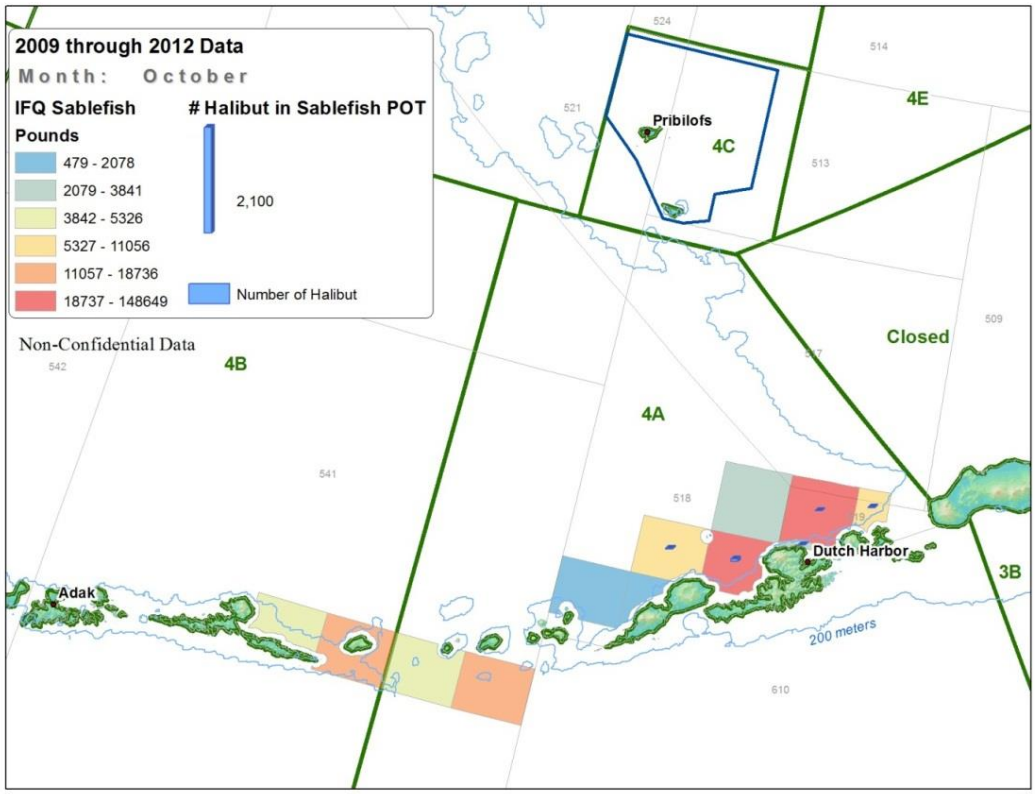

Figure 20 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery in pot gear by month.

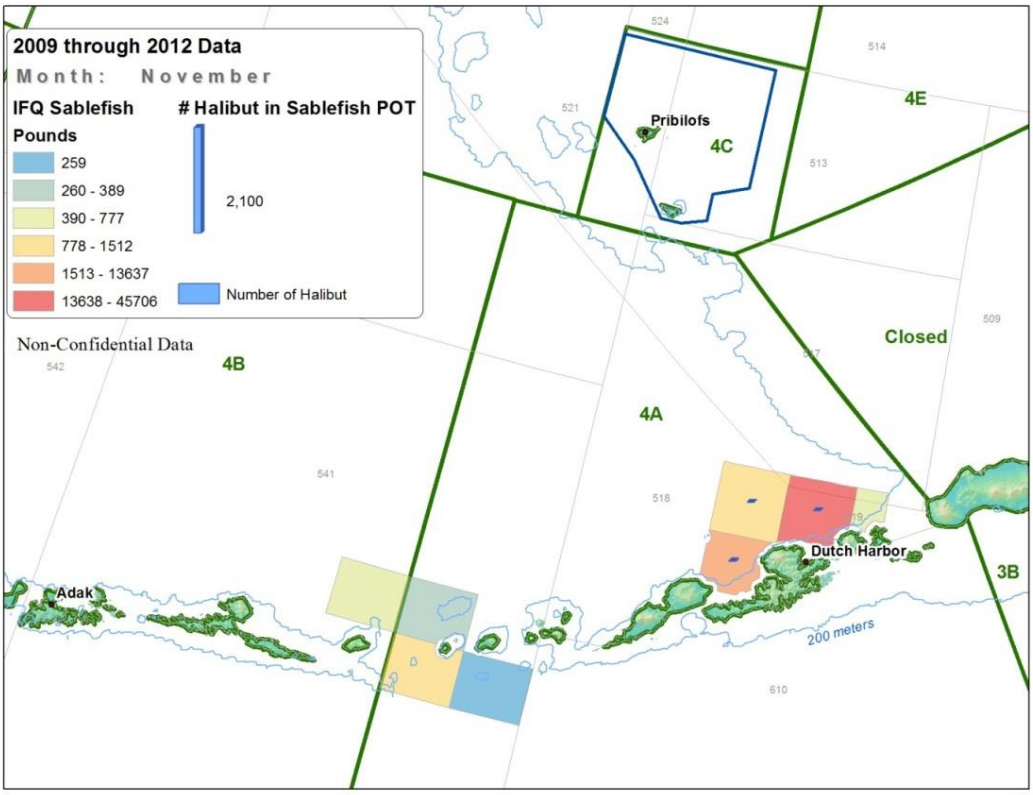

Figure 21 Number of total halibut (summed over 2009-2012) caught incidentally in IFQ sablefish fishery.

Current fishery information[5]

Bycatch and discards in all gear types

Prohibited species catches (PSC) in the targeted sablefish fisheries are dominated by halibut (1,060 t/year) and golden king crab (134,000 individuals/year) for both the BSAI and GOA; more detailed analysis in the affected area of the proposed action follows later in the paper. Overall, halibut catches seem to be decreasing, while catches of golden king crab are highly variable from year to year, probably as a result of low sampling effort in BSAI sablefish pot fisheries (Table 6).

Table 6. Prohibited Species Catch (PSC) estimates reported in tons for halibut and herring, thousands of animals for crab and salmon, by year, and fisheries management plan (BSAI or GOA) area for the sablefish fishery.

	2008			2009			2010			2011			Average
	BSAI	GOA	Total	BSAI	GOA	Total	BSAI	GOA	Total	BSAI	GOA	Total	
Hook and Line													
Bairdi Crab	0.00	0.01	0.01	0.03	0.24	0.28	0.00	0.07	0.07	0.00	0.00	0.00	0.09
Golden K. Crab	0.17	0.08	0.25	0.32	0.03	0.35	0.97	0.00	0.97	0.50	0.13	0.63	0.55
Halibut	151	953	1,104	186	1,023	1,209	220	760	980	135	813	948	1,060
Other Salmon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Crab	0.01	0.23	0.24	0.01	0.21	0.22	0.00	0.16	0.16	0.00	0.29	0.29	0.23
Red K. Crab	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.02	0.00	0.02	0.02
Other													
Bairdi Crab	0.14	0.18	0.32	1.65	0.08	1.74	0.00	0.06	0.06	0.94	0.00	0.00	0.53
Golden K. Crab	182	0	182	139	0	139	26	0	26	191	0	191	134
Halibut	28	7	35	17	3	20	39	4	43	17	6	23	30
Herring	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Other Salmon	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00
Opilio Crab	0.25	0.00	0.25	0.01	0.10	0.11	2.15	0.03	2.18	0.33	0.00	0.33	0.72
Red K. Crab	0.42	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.41	0.21

Source: NMFS AKRO Blend/Catch Accounting System PSCNQ via AKFIN, October 12, 2012.

The following is provided to place the halibut PSC data in context with other bycatch amounts. Table 7 shows groundfish bycatch in the sablefish target fishery. The largest bycatch is arrowtooth flounder (534 t/year, 456 t discarded). Arrowtooth is the only species that has substantial catch from non-longline gear. Shortspine thornyhead and shortraker rockfish are the second and third most caught species at 366 t/year and 207 t/year. The next three groups are "Other Species", GOA "Other Skate", and GOA longnose skate which total 415 t/year. Giant grenadiers, a non-target species that is not in either FMP, make up the bulk of the nontarget species bycatch, peaking at 9,315 t in 2007, but decreasing since with a 2011 catch of 6,652 t (Table 8a). Other nontarget catches that have totals over a ton per year are corals, snails, sponges, sea stars, and miscellaneous fishes and crabs.

Table 7. Bycatch (t) of FMP Groundfish species in the targeted sablefish fishery averaged from 2007-2011. Other = Pot and trawl combined because of confidentiality. Other Species is 2007-2010, and Sharks is only 2011. Source: NMFS AKRO Blend/Catch Accounting System via AKFIN, October 12, 2012.

	Hook and Line			Other Gear			All Gear		
Species	Discard	Retained	Total	Discard	Retained	Total	Discard	Retained	Total
Arrowtooth Flounder	320	66	385	137	12	148	456	78	534
Thornyhead rockfish	49	292	341	3	21	25	53	313	366
Shortraker Rockfish	81	93	173	7	26	34	89	119	207
Other Species	180	2	181	3	1	4	183	3	185
GOA Other Skate	135	4	139	1	0	1	137	4	141
GOA Longnose Skate	119	4	122	2	1	3	121	5	126
Other Rockfish	41	77	118	2	1	4	43	78	121
Greenland Turbot	37	54	91	16	2	18	53	56	109
Rougheye Rockfish	38	57	99	16	4	20	54	60	119
Pacific Cod	25	58	83	1	7	8	26	65	91
Shark	234	0	234	1	0	1	235	0	235
GOA Deep Water Flatfish	8	0	8	15	4	19	24	4	28
Pacific ocean perch	7	0	7	2	16	18	9	16	25
BSAI Skate	18	0	18	0	-	0	18	0	18
BSAI Shortraker Rockfish	8	8	15	0	0	0	8	8	16
GOA Demersal Shelf Rockfish	0	11	11	-	-	-	0	11	11
BSAI Other Flatfish	7	2	9	1	0	1	8	2	10
Pollock	0	0	1	5	3	9	5	4	9
GOA Shallow Water Flatfish	7	1	8	1	0	1	8	1	9
GOA Rex Sole	0	0	0	5	3	8	5	3	8
Total	1,315	728	2,046	220	102	322	1,535	830	2,369

Table 8a. Bycatch of nontarget species and HAPC biota in the targeted sablefish fishery. Source: NMFS AKRO Blend/Catch Accounting System via AKFIN, October 12, 2012. Conf. = confidential.

	Estimated Catch (t)					
Group Name	2006	2007	2008	2009	2010	2011
Benthic urochordata	0.08	0.00	-	0.01	0.12	0.13
Birds	0.91	1.59	0.55	0.40	0.35	1.43
Bivalves	0	Conf.	-	0	0.00	0.06
Brittle star unidentified	0.05	0.10	0.06	0.33	0.10	0.38
Corals Bryozoans	1.57	0.16	1.56	1.62	2.45	4.90
Dark Rockfish	-	-	Conf.	0	Conf.	-
Eelpouts	1.30	2.26	9.04	1.76	1.34	0.54
Eulachon	-	0	Conf.	0	Conf.	-
Giant Grenadier	4,030	9,315	8,897	5,369	4,402	6,652
Greenlings	-	76	0.02	0.02	-	0
Grenadier	4,907	109	128	961	749	810
Hermit crab unidentified	0.05	0.05	0.07	0.09	0.19	0.21
Invertebrate unidentified	0.07	0.02	0.01	0.42	0.76	1.88
Misc crabs	0.47	1.12	0.94	3.20	1.90	1.16
Misc crustaceans	-	-	-	2	0.00	0.00
Misc deep fish	0	0.00	-	0	-	0
Misc fish	18.34	17.10	21.19	4.72	4.01	7.96
Misc inverts (worms etc)	0	Conf.	0	0.01	0.00	0.00
Other osmerids	-	-	Conf.	-	-	-
Pandalid shrimp	0	0.00	0.00	0.01	0.00	0.00
Polychaete unidentified	-	-	0	0.00	0.00	0.00
Scypho jellies	0.10	0.00	Conf.	0	0	1
Sea anemone unidentified	0.29	3.34	0.69	1.99	1.32	3.06
Sea pens whips	0.19	0.08	0.32	0.49	0.03	1.52
Sea star	5.23	35.29	1.56	2.45	2.53	3.24
Snails	9.41	8.09	6.43	11.22	11.56	19.70
Sponge unidentified	0.71	0.16	14.65	1.92	0.76	1.99
Urchins, dollars, cucumbers	0.15	0.14	0.48	1.03	0.55	0.24

Discard mortality rates A discard mortality rate (DMR) for the CDQ sablefish pot fishery has been specified, but not for the open access fishery (Table 8). The lack of a DMR suggests a lack of data. An examination of all 2011 observed pot hauls (n=768) were coded with a Pacific cod target. There were only 8 hauls made over 200 f in depth, and none had sablefish reported in them.

Table 8. Recommended Pacific halibut discard mortality rates (DMRs) for 2013-2015 CDQ and non-CDQ groundfish fisheries off Alaska.

I. Non-CDQ

Bering Sea/Aleutians			Gulf of Alaska		
Gear/Target	**Used in 2010-2012**	**2013-2015 Recommendation**	**Gear/Target**	**Used in 2010-2012**	**2013-2015 Recommendation**
Trawl			***Trawl***		
Atka mack	76	77	Bottom poll	59	60
Bottom poll	73	77	Pacific cod	62	62
Pacific cod	71	71	Dpwtr flats	48	43
Other Flats	72	71	Shallwtr flats	71	67
Rockfish	81	79	Rockfish	67	66
Flathead sole	74	73	Flathead sole	65	65
Midwtr poll	89	88	Midwtr poll	76	71
Rock sole	82	85	Sablefish	65	71
Sablefish	75	75	Arr. fldr	72	73
Turbot	67	64	Rex sole	64	69
Arr. fldr	76	76			
YF sole	81	83			
Pot			***Pot***		
Pacific cod	8	8	Pacific cod	17	17
Longline			***Longline***		
Pacific cod	10	9	Pacific cod	12	11
Rockfish	9	4	Rockfish	9	9
Turbot	11	13			

II. Bering Sea/Aleutians CDQ

Gear/Target	**Used in 2010-2012**	**2013-2015 Recommendation**
Trawl		
Atka mackerel	85	86
Bottom pollock	85	83
Pacific cod	90	90
Rockfish	84	80
Flathead sole	84	79
Midwtr pollock	90	90
Rock sole	87	88
Turbot	88	89
Yellowfin sole	85	86
Pot		
Sablefish	32	34
Longline		
Pacific cod	10	10
Turbot	4	4

Whale depredation on sablefish Killer whale depredation of the NMFS longline survey's sablefish catches has been a problem in the BS since the beginning of the survey. Killer whale depredation primarily occurs in the eastern BS, AI, and Western GOA and to a lesser extent in recent years in the Central GOA. Depredation is easily identified by reduced sablefish catch and the presence of lips or jaws and bent, straightened, or broken hooks. Since 1990, portions of the gear at stations affected by killer whale depredation during the domestic longline survey have been excluded from the analysis of catch rates, RPNs, and RPWs. Killer whale depredation has been fairly consistent since 1996, which corresponds to when the AI and the BS were added to the survey (Table 9). A high of ten BS stations were depredated in 2009, which significantly impacted catch and biased the abundance index leading to using the 2007 BS RPN estimate to interpolate the 2009 and 2010 BS RPNs (Hanselman et al. 2009). In 2011, depredation levels in the BS were similar to previous years with catches at 7 of 16 stations affected. There was higher depredation in the AI in 2012 than most years (5 of 14 stations).

Table 9. Count of stations where sperm (S) or killer whale (K) depredation occurred in the six sablefish management areas. The number of stations sampled that are used for RPN 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". Killer whale depredation did not always occur on all skates of gear, and only those skates with depredation were cut from calculations of RPNs and RPWs

	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

Sperm whale depredation affects longline catches in the GOA, but evidence of depredation is not accompanied by obvious decreases in sablefish catch or common occurrence of lips and jaws or bent and broken hooks. Data on sperm whale depredation have been collected since the 1998 longline survey (Table 9). Sperm whales are often observed from the survey vessel during haulback but do not appear to be depredating on the catch. Sperm whale depredation during the longline survey is recorded at the station level and is defined as sperm whales being present during haulback with the occurrence of damaged sablefish in the catch. Sperm whales are most commonly observed in the Central and Eastern GOA, with the majority of depredation occurring in the West Yakutat and East Yakutat/Southeast areas. Depredation has been variable since 1998.

Multiple studies have attempted to quantify sperm whale depredation rates. An early study using data collected by fisheries observers in Alaskan waters found no significant effect on the commercial fishery catch. Another study using data collected from commercial vessels in southeast Alaska, found a small, significant effect comparing longline fishery catches between sets with sperm whales present and sets with sperm whales absent.

4. SOCIO-ECONOMIC ISSUES

A) safety issue related to use of pots by small vessels

Some sablefish IFQ vessels in Southeast Alaska may be too small to safely carry, set, and retrieve traditional pot gear in Southeast. Some vessels in Central GOA and Western GOA could use pot gear due to their larger size. Figure 22 shows that perhaps 30 of 387 (GOA, BS, and AI) sablefish IFQ vessels currently crossover into the groundfish pot fishery. The AKFIN database that generated the Council's Fishing Fleet Profiles[15] could be used to provide additional detail for the GOA and Southeast GOA (only) in a future analysis, if requested by the Council (Appendix 1).

Fleet	A80	AFA Catcher Processors	AFA Motership	AFA Catcher Vessels	Other BSAI Trawl	Freezer Longline	Longline Catcher Vessels	Groundfish Pot	Jig	Central Gulf Trawl	Western Gulf Trawl	Halibut IFQ	Halibut CDQ	Sablefish	BSAI Crab	Scallop
A80	21	1	0	0	0	0	0	0	0	8	14	0	0	0	0	0
AFA Catcher Processors	1	16	0	0	0	0	0	0	0	0	1	0	0	0	0	0
AFA Motership	0	0	14	8	0	0	0	0	0	1	1	0	0	0	0	0
AFA Catcher Vessels	0	0	8	81	0	0	0	0	0	20	2	2	0	0	1	0
Other BSAI Trawl	0	0	0	0	21	0	0	2	0	12	4	1	0	0	0	1
Freezer Longline	0	0	0	0	0	35	0	3	0	0	0	7	0	15	2	0
Longline Catcher Vessels	0	0	0	0	0	0	67	0	2	0	0	60	1	45	0	0
Groundfish Pot	0	0	0	0	2	3	0	137	7	3	10	58	3	30	34	1
Jig	0	0	0	0	0	0	2	7	118	0	0	23	0	3	0	0
Central Gulf Trawl	8	0	1	20	12	0	0	3	0	59	14	5	0	1	0	0
Western Gulf Trawl	14	1	1	2	4	0	0	10	0	14	39	11	0	3	0	0
Halibut IFQ	0	0	0	2	1	7	60	58	23	5	11	1028	16	352	7	0
Halibut CDQ	0	0	0	0	0	0	1	3	0	0	0	16	241	10	0	0
Sablefish	0	0	0	0	0	15	45	30	3	1	3	352	10	387	6	0
BSAI Crab	0	0	0	1	0	2	0	34	0	0	0	7	0	6	77	1
Scallop	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	4

Figure 22. Fleet crossover between fisheries.

The committee noted that safety is tied more to the skills of the skipper than the size of the vessel. The committee discussed requirements for stability tests by private insurers when structural changes that affect weight distribution of the vessel are made.

B) crew employment

The committee noted that no crew jobs would be lost as a result of allowing longline pot gear in the sablefish IFQ fishery. More important to retaining crew jobs is maintaining the current composition of the fleet (i.e., no more consolidation (e.g., changes to the vessel cap). The committee suggested that information on the range of crew sizes in the longline fisheries would be informative. This proposed action could be designed such that pot limits could provide good brakes on consolidation. Generally, the committee observed that maintaining the original objectives of the IFQ program could constrain the potential changes that could result from allowing longline pot gear to harvest sablefish.

C) QS prices (Source: NMFS RAM)[16]

The estimated average QS prices in dollars per pound of IFQ have risen each year in all areas. Table 10 shows estimated weighted annual prices per QS unit transferred by area for 1995 through 2011. Table 11 provides QS price estimates by management area and vessel category. Prices shown were calculated from

[15] https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/resources/FleetProfilesAdd1112.pdf

[16] The QS prices for the BS and AI QS were generally based on only a few transactions; prices tended to be much lower in other areas. QS prices in dollars per QS unit are not comparable across areas since the ratio of IFQ to QS differs from area to area and from year to year as TACs change.

Table 10. Annual Prices for Sablefish QS and IFQ Transfers by Area and Year. (Source: RAM)

Area	Year	Mean Price $/IFQ	Stan Dev Price $/IFQ	Tot IFQs Transacted Used for Pricing	Mean Price $/QS	Stan Dev Price $/QS	Total QS Transacted Used for Pricing	Number of Transactions Used for Pricing
Southeast	1995	6.73	0.95	714,993	1.28	0.18	3,771,994	102
	1996	8.05	1.61	460,777	1.21	0.24	3,067,913	86
	1997	10.76	2.02	303,609	1.31	0.25	2,496,791	72
	1998	11.11	1.96	102,892	1.29	0.23	886,458	31
	1999							
	2000	10.57	1.78	166,186	1.25	0.21	1,400,980	34
	2001	12.22	4.79	212,746	1.37	0.54	1,896,455	29
	2002	10.23	1.92	405,427	1.10	0.21	3,783,682	43
	2003	11.00	1.82	411,183	1.31	0.22	3,464,060	55
	2004	11.69	1.73	209,397	1.47	0.22	1,666,128	32
	2005	11.57	1.09	279,550	1.38	0.13	2,348,556	41
	2006	12.18	1.35	205,200	1.43	0.16	1,749,468	30
	2007	14.65	2.77	241,705	1.64	0.31	2,154,722	37
	2008	15.64	3.52	42,488	1.68	0.38	395,728	18
	2009	18.22	2.69	51,533	1.67	0.25	562,866	17
	2010	20.94	4.56	21,109	1.80	0.39	245,391	9
	2011	25.09	3.72	130,007	2.46	0.37	1,326,253	20
W. Yakutat	1995	5.93	0.87	208,230	0.92	0.13	1,339,123	33
	1996	7.62	1.23	240,912	0.88	0.14	2,090,726	51
	1997	9.04	2.11	182,257	0.85	0.2	1,928,688	58
	1998	9.23	2.66	22,538	0.83	0.24	250,157	17
	1999							
	2000	10.15	2.35	111,492	0.81	0.19	1,402,337	27
	2001	10.01	2.57	38,808	0.74	0.19	523,760	11
	2002	10.49	3.30	143,866	0.73	0.23	2,065,214	20
	2003	10.87	2.00	79,239	0.91	0.17	945,017	20
	2004	12.21	2.05	28,031	1.13	0.19	303,156	9
	2005	12.47	2.64	132,276	1.17	0.25	1,408,437	21
	2006	11.48	1.72	80,974	0.94	0.14	983,166	20
	2007	15.12	2.62	192,315	1.25	0.21	2,326,792	19
	2008	13.85	2.63	28,785	1.06	0.2	375,340	15
	2009	17.18	1.36	10,483	1.11	0.09	162,669	5
	2010	22.06	5.29	23,502	1.29	0.31	402,729	9
	2011	25.61	5.05	94,001	1.85	0.36	1,302,292	19
C. Gulf	1995	6.02	0.92	542,427	0.82	0.12	3,979,925	53
	1996	7.06	1.59	576,517	0.77	0.17	5,312,742	70
	1997	9.36	1.73	707,533	0.95	0.18	6,950,682	82
	1998	10.68	2.42	218,048	1.07	0.24	2,176,369	39
	1999							
	2000	9.11	1.58	448,909	0.82	0.14	4,958,461	49
	2001	9.64	1.84	124,247	0.82	0.16	1,455,795	29
	2002	9.98	2.85	251,856	0.86	0.25	2,935,443	24
	2003	10.16	1.64	470,143	1.03	0.17	4,624,442	53
	2004	11.50	3.22	207,013	1.33	0.37	1,795,496	23
	2005	10.80	2.69	304,111	1.24	0.31	2,656,281	35
	2006	12.60	4.11	472,608	1.27	0.41	4,685,401	29
	2007	13.94	3.93	364,627	1.36	0.38	3,730,291	33
	2008	15.98	3.89	240,480	1.39	0.34	2,768,837	30
	2009	16.75	4.36	71,882	1.32	0.34	912,228	14
	2010	17.95	5.88	90,350	1.28	0.42	1,268,608	13
	2011	22.83	3.86	104,706	1.71	0.29	1,398,595	19

W. Gulf	1995	6.16	0.85	129,351	0.76	0.1	1,052,708	12
	1996	5.53	0.82	265,044	0.57	0.08	2,566,140	11
	1997	7.06	1.45	113,032	0.64	0.13	1,237,647	30
	1998	8	0.81	77,939	0.72	0.07	864,090	19
	1999							
	2000	6.49	1.15	143,154	0.59	0.11	1,591,230	19
	2001	7.12	1.74	178,679	0.70	0.17	1,815,991	19
	2002	5.08	0.52	16,789	0.56	0.06	153,112	4
	2003	6.85	1.53	138,688	0.86	0.19	1,102,407	10
	2004	8.19	1.48	295,712	1.17	0.21	2,061,746	24
	2005	10.70	4.91	242,546	1.33	0.61	1,950,728	15
	2006	7.87	0.88	192,139	1.03	0.12	1,470,086	10
	2007	8.18	1.48	217,181	0.99	0.18	1,796,245	17
	2008	9.5	2.27	138,744	0.88	0.21	1,499,642	14
	2009	12.11	3.07	67,548	0.97	0.25	841,404	8
	2010	11.08	3.07	114,964	0.90	0.25	1,414,807	16
	2011	13.34	1.30	89,137	1.06	0.10	1,124,030	11
Bering Sea	1995	4.87	0.58	11,951	0.42	0.05	138,800	4
	1996	6.63	5.18	41,493	0.36	0.28	757,451	5
	1997	3.29	0.35	32,695	0.17	0.02	626,938	5
	1998	C	C	7,409	C	C	120,235	3
	1999							
	2000	3.19	1.53	135,547	0.22	0.11	1,962,203	14
	2001	2.77	0.81	83,598	0.20	0.06	1,140,555	7
	2002	3.77	1.31	147,020	0.34	0.12	1,621,302	7
	2003	4.45	1.94	573,468	0.61	0.27	4,208,803	20
	2004	4.01	1.67	125,162	0.55	0.23	918,589	7
	2005	2.90	1.53	168,218	0.33	0.17	1,469,002	11
	2006	3.96	1.35	80,108	0.53	0.18	605,310	5
	2007	2.21	0.63	83,458	0.31	0.09	596,757	6
	2008	2.54	1.25	94,286	0.34	0.17	697,372	10
	2009	4.04	1.69	92,980	0.52	0.22	728,398	7
	2010	4.66	1.89	401,961	0.63	0.25	2,983,238	14
	2011	4.99	1.30	264,806	0.67	0.17	1,977,198	13
Aleutians	1995	4.57	0.52	91,553	0.43	0.05	979,271	6
	1996	8.89	3.9	72,881	0.45	0.2	1,446,140	4
	1997	4.14	0.5	66,726	0.21	0.03	1,324,979	10
	1998	3.4	0.59	38,599	0.2	0.03	667,559	8
	1999							
	2000	2.01	0.59	72,398	0.20	0.06	719,028	14
	2001	2.34	0.83	97,540	0.24	0.08	941,871	5
	2002	2.96	0.10	32,061	0.31	0.01	303,445	2
	2003	3.37	1.14	502,187	0.43	0.15	3,910,721	9
	2004	2.60	0.00	35,621	0.33	0.00	277,399	4
	2005	2.66	2.16	286,999	0.29	0.23	2,644,413	9
	2006	2.71	1.22	435,971	0.34	0.15	3,508,222	6
	2007	2.69	0.41	159,707	0.31	0.05	1,372,043	8
	2008	2.96	0.77	241,854	0.3	0.08	2,392,855	8
	2009	3.26	0.84	380,862	0.3	0.08	4,179,226	10
	2010	3.17	0.99	72,717	0.28	0.09	839,671	5
	2011	3.22	0.94	284,724	0.28	0.08	3,320,527	8

Table 11. Annual prices for sablefish QS and IFQ transfers by area, vessel category, and year. (Source: RAM)

Area	Year	Mean Price $/IFQ	Stan Dev Price $/IFQ	Tot IFQs Transacted Used for Pricing	Mean Price $/QS	Stan Dev Price $/QS	Tot QS Transacted Used for Pricing	Number of Transactions Used for Pricing
Southeast	1995	6.73	0.95	714,993	1.28	0.18	3,771,994	102
	1996	8.05	1.61	460,777	1.21	0.24	3,067,913	86
	1997	10.76	2.02	303,609	1.31	0.25	2,496,791	72
	1998	11.11	1.96	102,892	1.29	0.23	886,458	31
	1999							
	2000	10.57	1.78	166,186	1.25	0.21	1,400,980	34
	2001	12.22	4.79	212,746	1.37	0.54	1,896,455	29
	2002	10.23	1.92	405,427	1.10	0.21	3,783,682	43
	2003	11.00	1.82	411,183	1.31	0.22	3,464,060	55
	2004	11.69	1.73	209,397	1.47	0.22	1,666,128	32
	2005	11.57	1.09	279,550	1.38	0.13	2,348,556	41
	2006	12.18	1.35	205,200	1.43	0.16	1,749,468	30
	2007	14.65	2.77	241,705	1.64	0.31	2,154,722	37
	2008	15.64	3.52	42,488	1.68	0.38	395,728	18
	2009	18.22	2.69	51,533	1.67	0.25	562,866	17
	2010	20.94	4.56	21,109	1.80	0.39	245,391	9
	2011	25.09	3.72	130,007	2.46	0.37	1,326,253	20
W. Yakutat	1995	5.93	0.87	208,230	0.92	0.13	1,339,123	33
	1996	7.62	1.23	240,912	0.88	0.14	2,090,726	51
	1997	9.04	2.11	182,257	0.85	0.2	1,928,688	58
	1998	9.23	2.66	22,538	0.83	0.24	250,157	17
	1999							
	2000	10.15	2.35	111,492	0.81	0.19	1,402,337	27
	2001	10.01	2.57	38,808	0.74	0.19	523,760	11
	2002	10.49	3.30	143,866	0.73	0.23	2,065,214	20
	2003	10.87	2.00	79,239	0.91	0.17	945,017	20
	2004	12.21	2.05	28,031	1.13	0.19	303,156	9
	2005	12.47	2.64	132,276	1.17	0.25	1,408,437	21
	2006	11.48	1.72	80,974	0.94	0.14	983,166	20
	2007	15.12	2.62	192,315	1.25	0.21	2,326,792	19
	2008	13.85	2.63	28,785	1.06	0.2	375,340	15
	2009	17.18	1.36	10,483	1.11	0.09	162,669	5
	2010	22.06	5.29	23,502	1.29	0.31	402,729	9
	2011	25.61	5.05	94,001	1.85	0.36	1,302,292	19
C. Gulf	1995	6.02	0.92	542,427	0.82	0.12	3,979,925	53
	1996	7.06	1.59	576,517	0.77	0.17	5,312,742	70
	1997	9.36	1.73	707,533	0.95	0.18	6,950,682	82
	1998	10.68	2.42	218,048	1.07	0.24	2,176,369	39
	1999							
	2000	9.11	1.58	448,909	0.82	0.14	4,958,461	49
	2001	9.64	1.84	124,247	0.82	0.16	1,455,795	29
	2002	9.98	2.85	251,856	0.86	0.25	2,935,443	24
	2003	10.16	1.64	470,143	1.03	0.17	4,624,442	53
	2004	11.50	3.22	207,013	1.33	0.37	1,795,496	23
	2005	10.80	2.69	304,111	1.24	0.31	2,656,281	35
	2006	12.60	4.11	472,608	1.27	0.41	4,685,401	29
	2007	13.94	3.93	364,627	1.36	0.38	3,730,291	33
	2008	15.98	3.89	240,480	1.39	0.34	2,768,837	30
	2009	16.75	4.36	71,882	1.32	0.34	912,228	14
	2010	17.95	5.88	90,350	1.28	0.42	1,268,608	13
	2011	22.83	3.86	104,706	1.71	0.29	1,398,595	19

W. Gulf	1995	6.16	0.85	129,351	0.76	0.1	1,052,708	12
	1996	5.53	0.82	265,044	0.57	0.08	2,566,140	11
	1997	7.06	1.45	113,032	0.64	0.13	1,237,647	30
	1998	8	0.81	77,939	0.72	0.07	864,090	19
	1999							
	2000	6.49	1.15	143,154	0.59	0.11	1,591,230	19
	2001	7.12	1.74	178,679	0.70	0.17	1,815,991	19
	2002	5.08	0.52	16,789	0.56	0.06	153,112	4
	2003	6.85	1.53	138,688	0.86	0.19	1,102,407	10
	2004	8.19	1.48	295,712	1.17	0.21	2,061,746	24
	2005	10.70	4.91	242,546	1.33	0.61	1,950,728	15
	2006	7.87	0.88	192,139	1.03	0.12	1,470,086	10
	2007	8.18	1.48	217,181	0.99	0.18	1,796,245	17
	2008	9.5	2.27	138,744	0.88	0.21	1,499,642	14
	2009	12.11	3.07	67,548	0.97	0.25	841,404	8
	2010	11.08	3.07	114,964	0.90	0.25	1,414,807	16
	2011	13.34	1.30	89,137	1.06	0.10	1,124,030	11
Bering Sea	1995	4.87	0.58	11,951	0.42	0.05	138,800	4
	1996	6.63	5.18	41,493	0.36	0.28	757,451	5
	1997	3.29	0.35	32,695	0.17	0.02	626,938	5
	1998	C	C	7,409	C	C	120,235	3
	1999							
	2000	3.19	1.53	135,547	0.22	0.11	1,962,203	14
	2001	2.77	0.81	83,598	0.20	0.06	1,140,555	7
	2002	3.77	1.31	147,020	0.34	0.12	1,621,302	7
	2003	4.45	1.94	573,468	0.61	0.27	4,208,803	20
	2004	4.01	1.67	125,162	0.55	0.23	918,589	7
	2005	2.90	1.53	168,218	0.33	0.17	1,469,002	11
	2006	3.96	1.35	80,108	0.53	0.18	605,310	5
	2007	2.21	0.63	83,458	0.31	0.09	596,757	6
	2008	2.54	1.25	94,286	0.34	0.17	697,372	10
	2009	4.04	1.69	92,980	0.52	0.22	728,398	7
	2010	4.66	1.89	401,961	0.63	0.25	2,983,238	14
	2011	4.99	1.30	264,806	0.67	0.17	1,977,198	13
Aleutians	1995	4.57	0.52	91,553	0.43	0.05	979,271	6
	1996	8.89	3.9	72,881	0.45	0.2	1,446,140	4
	1997	4.14	0.5	66,726	0.21	0.03	1,324,979	10
	1998	3.4	0.59	38,599	0.2	0.03	667,559	8
	1999							
	2000	2.01	0.59	72,398	0.20	0.06	719,028	14
	2001	2.34	0.83	97,540	0.24	0.08	941,871	5
	2002	2.96	0.10	32,061	0.31	0.01	303,445	2
	2003	3.37	1.14	502,187	0.43	0.15	3,910,721	9
	2004	2.60	0.00	35,621	0.33	0.00	277,399	4
	2005	2.66	2.16	286,999	0.29	0.23	2,644,413	9
	2006	2.71	1.22	435,971	0.34	0.15	3,508,222	6
	2007	2.69	0.41	159,707	0.31	0.05	1,372,043	8
	2008	2.96	0.77	241,854	0.3	0.08	2,392,855	8
	2009	3.26	0.84	380,862	0.3	0.08	4,179,226	10
	2010	3.17	0.99	72,717	0.28	0.09	839,671	5
	2011	3.22	0.94	284,724	0.28	0.08	3,320,527	8

transfers in which the actual current-year IFQ was transferred with the QS and was within 5% of the standard IFQ per unit of QS for that year and management area.[17] The pounds of IFQ, the amount of QS, and the number of transfers used to produce the estimates are also shown. Prices in dollars per pound of

[17] Standard IFQs were calculated by multiplying the amount of QS by the ratio of the area's total allowable catch to the amount of QS in the area's QS pool on January 31st of the year. Mean and standard deviations for the price per QS unit are provided in dollars per pound of IFQ and in dollars per QS unit.

associated IFQ that are reported by NMFS RAM Division are comparable across areas. In the four areas in which prices are based on a relatively large number of transactions, the prices ranged from a low of $2.01 in the AI area in 2000 to a high of $25.61 in the West Yakutat area in 2012.

For all of these tables there are several caveats associated with the reported statistics. The information provided on the NMFS transfer application forms can be ambiguous. In many of the area and vessel category combinations there are so few transactions that confidentiality standards do not permit reporting the price data. In some of the cases for which estimated prices are reported, they are based on small numbers of transactions. Due to a significant database change, 1999 data are not available in the following tables.

The committee observed that sablefish caught in pots are comparable to longline fish, particularly with voluntary bleeding of fish. An expectation is that QS prices will increase as a result of increased sablefish biomass that would result from decreased whale depredation and unaccounted mortality. QS prices are tied to buyers' perceptions of the future.

5) ADDITIONAL TOPICS

a. WHALE DEPREDATION AND INTERACTIONS and d. REVIEW OF CURRENT LITERATURE ON WHALE PREDATION

KILLER WHALES

Depredation by killer whales and sperm whales is common in the Alaska sablefish IFQ fishery (Sigler et al. 2008, Peterson et al. 2013). Killer whale depredation generally occurs in the BS, AI, and Western GOA, whereas sperm whale depredation tends to be more problematic in the central and eastern Gulf through Southeast Alaska (Figure 6). 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 will be held at the Woods Hole Oceanographic Institution in October 2013.

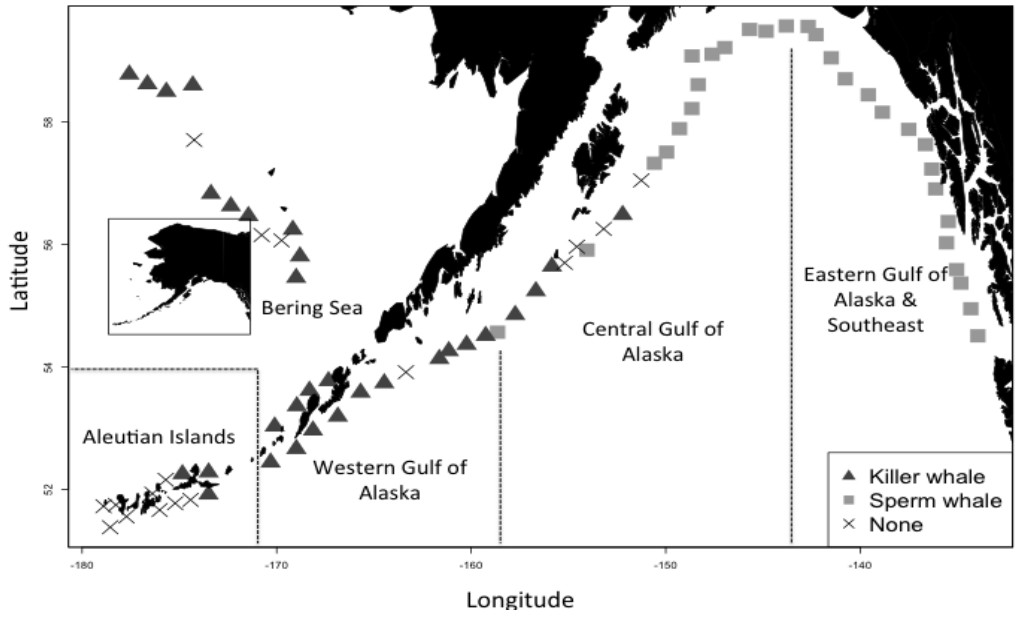

Figure 23. Whale depredation by whale species and sablefish management areas based on NMFS longline survey, 1998-2011. NMFS longline survey locations mirror commercial longline fishing grounds along the continental slope (Peterson and Carothers 2013).

Killer whale depredation is problematic in western Alaska, 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 2012). It was estimated in 2010 that a minimum of 1300 resident killer whales inhabit the BSAI and WGOA (Angliss and Outlaw, 2010). However, more recent

photographic mark-recapture assessments indicate that significantly more (perhaps twice this number) fish-eating residents may use the coastal waters around the eastern and central Aleutians alone in some years (Fearnbach 2012). Although diet data is limited in the region, Alaskan resident killer whales have been observed feeding on Pacific salmon, Atka mackerel and Pacific halibut (Ford et al. 1998, Herman et al. 2005, Krahn et al. 2007, Fearnbach et. 2012, Peterson et al. 2013). 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, although longer movements are documented (Ford and Ellis 2006, Forney and Wade 2006, Matkin et al. 2007, Fearnbach, 2012).

Killer whale depredation on the longline survey

Killer whales depredate a number of groundfish species caught on longline gear in western Alaska including: sablefish, Greenland turbot, arrowtooth flounder and Pacific halibut (Yano and Dalheim 1995, Peterson et al. 2013). Peterson et al. (2013) used NMFS 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 Western GOA (Figure 7). When killer whales were present during survey gear retrieval, whales removed an estimated 54–72% of sablefish, 41–84% of arrowtooth flounder and 73% (BS only) of Greenland turbot. Overall sablefish catches (depredated and non-depredated sets) were lower by 11-29% in all three management areas. The frequency of killer whale interactions remained fairly stable in the BS while increasing in the AI and Western GOA during the study period (Peterson et al. 2013).

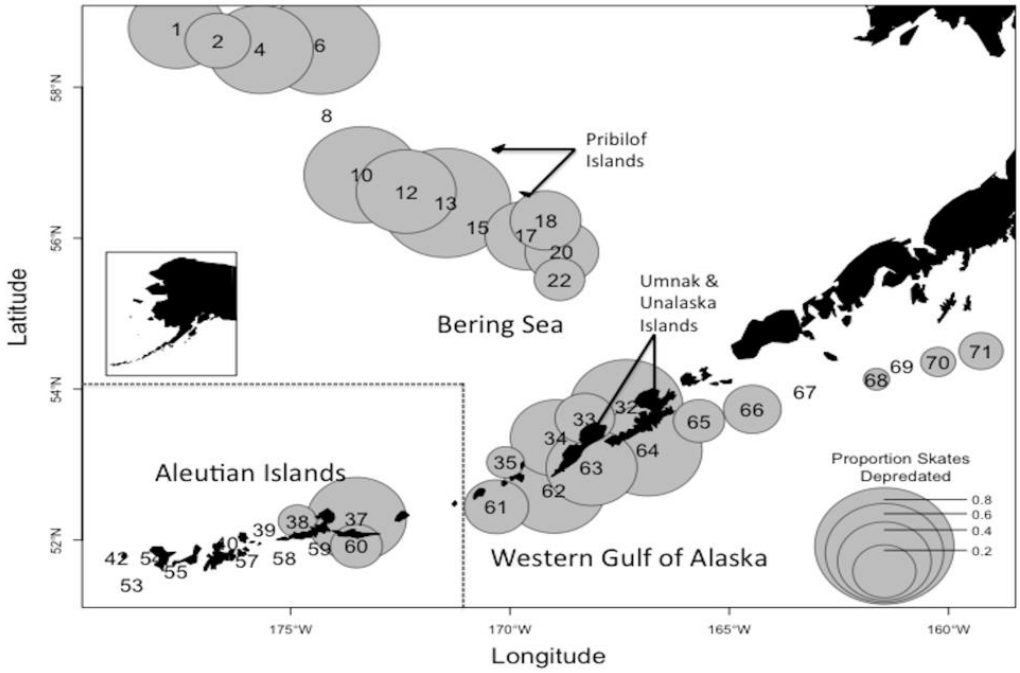

Figure 24. Stations surveyed (numbered 1-71) in the Bering Sea, Aleutian Islands and Western Gulf of Alaska, NMFS longline survey 1998-2011. Symbol sizes (grey circles) are equivalent to the average proportion of skates (string of 45 hooks) depredated by killer whales at each station (Peterson et al. 2013).

Killer whale depredation on the commercial fishery

In a follow-up study, Peterson et al. (*in review*) extended the analyses above to evaluate the impacts of killer whale depredation on commercial longline fisheries in western Alaska. This study synthesized NMFS observer data and fishermen-collected depredation data to: 1) estimate the frequency of killer whale depredation on commercial longline fisheries; 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 Western

GOA (~2%). On depredated sets, sablefish catch per unit effort reductions associated with depredating killer whales ranged from 55-69% (Peterson et al. i*n review*).

In direct response to depressed CPUEs associated with killer whale depredation, affected commercial longline fishermen reportedly react in two primary ways: 1) dropping their gear back down to "wait the whales out," 2) or moving to a different fishing site to avoid the whales (Peterson and Carothers 2013). Both of these depredation avoidance measures results in reduced fishing efficiency through increased operation costs and opportunity costs in lost time (extended soak times and distances traveled). Fishermen operating in western Alaska reported waiting on average at least 12 hours and /or steaming in excess of 25 nm to avoid depredating killer whales (Peterson and Carothers 2013). These depredation avoidance measures can be costly for commercial longliners as fishermen are forced to travel farther and stay on the grounds longer to catch the same amount of quota. In a study conducted with six longline vessels operating in western Alaska in 2011 and 2012, killer whale depredation resulted in an estimated additional $980 per vessel-day for additional fuel, crew food and the opportunity cost of lost time. Based on data from the observed commercial fishery, the additional costs associated with catching the same amount of fish on killer whale depredated sets was estimated to be approximately $433 ± 147 per set for additional fuel alone (not including additional crew, bait or opportunity costs; Peterson et al. *In Review*).

Based on NMFS survey data, NMFS observer data and fishermen accounts, killer whale depredation is most severe in the BS. Killer whale depredation in the Western Gulf may be a more recent issue and is less consistent (Peterson et al. 2013). Despite low interaction rates for the observed fleet in the Western Gulf of Alaska, fishermen accounts and NMFS longline survey data suggest that killer whale depredation on sablefish longline fisheries in the Western Gulf of Alaska is problematic and may be getting worse (Peterson et al. 2013, Peterson and Carothers, 2013). Based on 70 semi-directed interviews and 95 written surveys conducted with longline fishermen in Alaska, fishermen's perspective on legalizing pot fishing gear for sablefish in the Gulf of Alaska were varied. Written survey respondents were asked if the switch to pot fishing gear was an option for their vessel. Answers were mixed and varied by region fished and vessel category. Generally, sablefish longliners operating vessels greater than 60 feet were most likely to agree that the transition to pot gear was a feasible option for them. The majority of fishermen operating with smaller vessels or fishing out of Southeast Alaska reported the transition to pot gear would be less feasible for their operations (Peterson and Carothers, 2013).

SPERM WHALES

Sperm whale depredation affects longline catches in the GOA. Data on sperm whale depredation of longline survey catches have been collected since 1998 (Figure 8). Apparent sperm whale depredation is defined as sperm whales being present with the occurrence of damaged sablefish. While it is difficult to estimate the loss of fish due to depredation, estimates are generally conservative because it is not possible to attribute an empty hook (bait removed or disintegrated) to depredation. Additionally it can be difficult to distinguish whether other species, such as sharks or killer whales, have contributed to the damage or loss of hooked fish. Damage and loss of fish has significant economic and management implications for both fisherman and fishery biologists tasked with assessing fish stocks. In general, depredation by sperm whales seems to be low to moderate, but it is highly variable in extent both among and within fishing areas. The frequency of sperm whales present during fishing operations varies widely from 0 – 100%. Illustrative estimates include 16% of sampling days during the annual sablefish longline survey in the GOA (Lunsford et al. 2006); 39% of longline fishery hauls near Sitka (Straley et al. 2006).

Sperm whale depredation on the longline survey

Between 1998 and 2012, sperm whale depredation on GOA longline survey stations occurred on approximately 7-35% of sets ($\bar{x}$=16.8%; Figure 8). The percentage of sets impacted by sperm whale depredation was greatest in West Yakutat in most years (38%), followed by Southeast Alaska (28%) and the Central Gulf (8%; Figure 9). In the 2002 SAFE Report, an analysis using longline survey data from 1998-2001 found that sablefish catches were significantly less at stations affected by sperm whale depredation. This work was repeated in 2006 using additional data from 2002-2004 which were analyzed by fitting the data with a general linear model (Sigler et al. 2008). Neither sperm whale presence nor depredation rate increased significantly from 1998 to 2004. Catch rates were about 2% less at locations

where depredation occurred, but the effect was not significant. Sigler (2008) reported a 5% lower catch rate in sets with depredation evidence in a comparison of all sets with sperm whales present from 1999 to 2001.

Longline survey catch rates are not adjusted for sperm whale depredation because it is not known when measureable depredation began during the survey time series, and because studies of depredation on the longline survey showed no significant effect (Sigler et al. 2008). Current abundance is unbiased if depredation has consistently occurred over time. If significant depredation began recently, then current biomass is underestimated because the relationship between the survey index and biomass has changed. However, if recent catch rates are adjusted for sperm whale depredation when in fact it has happened all along, then current biomass will be overestimated.

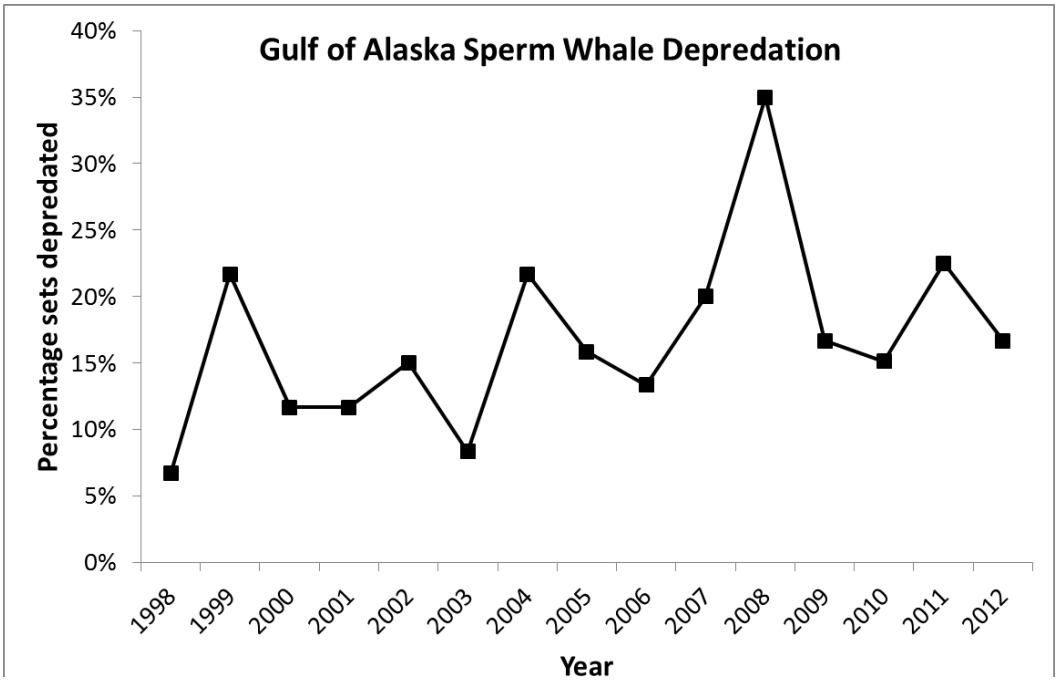

Figure 25.Sperm whale depredation on Gulf of Alaska stations, NMFS longline survey 1998-2012.

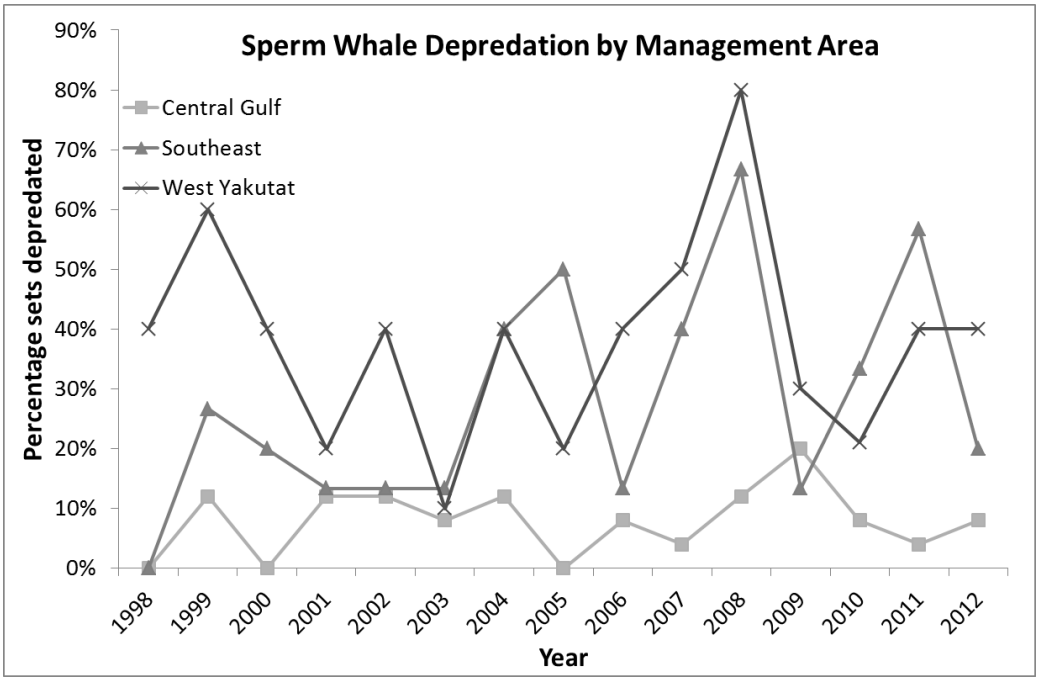

Figure 26. Sperm whale depredation in the Central Gulf of Alaska, West Yakutat and Southeast Alaska management areas, NMFS longline survey 1998-2012.

Sperm whale depredation on the commercial longline fishery

An early study using data collected by fisheries observers in Alaskan waters found no significant effect on catch (Hill et al. 1999). Another study using data collected in southeast Alaska, found a small, significant effect comparing longline fishery catches between sets with sperm whales present and sets with sperm whales absent (3% reduction, Straley et al. 2005). The rate of depredation, quantified in varying ways, also fluctuates widely. Examples include 0.6% of annual sablefish catch for Alaska and catch is reduced by 1.8% when depredation occurs (Sigler et al. 2008, Lunsford et al. 2006) and 3% of catch in the Sitka fishing grounds, which extends approximately from Dixon Entrance to Cape Ommaney (Straley et al. 2006). Perez et al. (2006) estimated that marine mammal depredation on the combined longline fisheries in Alaska caused a loss of about 2.2 % of the total fishery groundfish catch during 1998-2004, based on visual evidence of torn or partial fish.

Sperm whale sightings were also noted in some logbooks and observer data, however sperm whale presence does not imply depredation and when depredation occurs it is often minimal and difficult to quantify in comparison to killer whale depredation. Therefore, sperm whale depredated sets are not excluded from observer data or logbook data. A preliminary review of NMFS observer data suggests that the proportion of observed longline sets impacted by sperm whales was variable in the GOA between 2002 and 2012. Sets targeting sablefish were identified based on the predominant groundfish species in the set. Between 2002 and 2012, 0-7% ($\bar{x}$= 1.1%) sets were labeled as depredated by sperm whales in in the Western Gulf, 1-14% ($\bar{x}$= 5.9%) in the Central Gulf, 0-10% ($\bar{x}$= 4.3%) in West Yakutat, and 0-16% ($\bar{x}$= 5.9%) in Southeast (Figure 10).

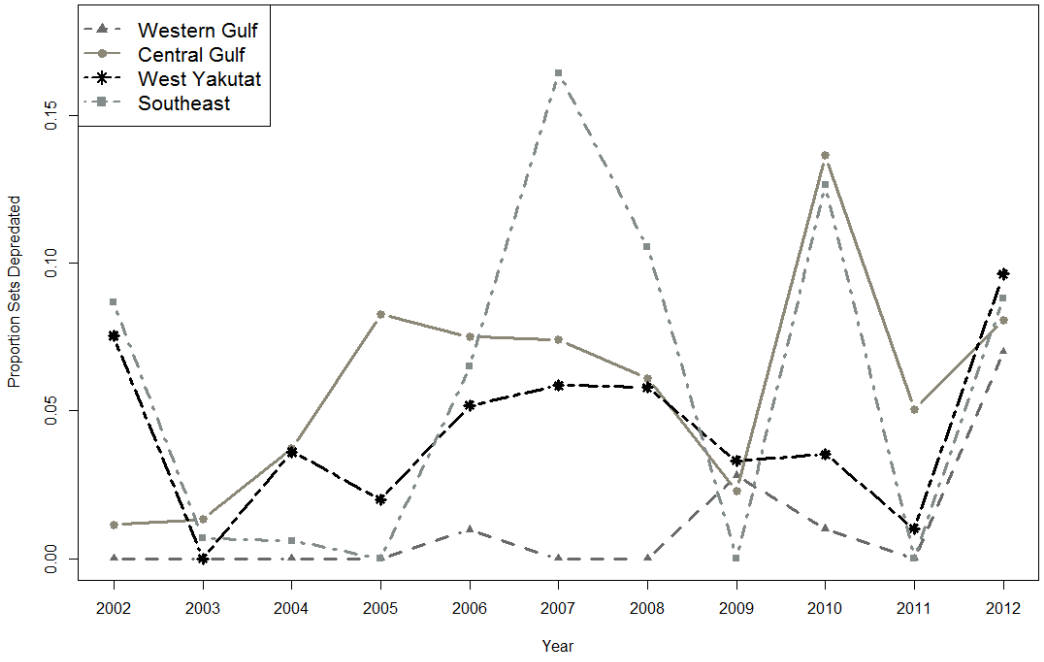

Figure 27. The proportion of sets labeled as impacted by "considerable sperm whale predation" by management area, NMFS observer commercial data 2002-2012.

General information

The current population of sperm whales in the GOA is unknown. Because they are an endangered species, fishermen and scientists are concerned about potential entanglements in fishing gear. Few reports of entanglement, injury or death in longline gear have been recorded. Such entanglements are costly and dangerous to fishermen and can force fishery closures. Entanglements in fishing gear with no apparent serious injury have been reported in Alaska (Angliss and Lodge 2003, Angliss and Outlaw 2005).

Mesnick et al. (undated expanded abstract) reports the following. All fishing grounds where depredation is reported to occur overlap with known natural feeding grounds of sperm whales. The species of fishes recorded during sperm whale depredation is often the same species reported to be found in the stomachs of sperm whales taken by whalers who years earlier were operating at the same sites. Fish were commonly found in sperm whale stomachs taken in the eastern Gulf of Alaska while squid was more common in whales taken in the BS and western Aleutians (Okutani and Nemoto 1964). Depredating sperm whales appear to be selective in prey choice. For example, in Alaska bycatch is not regularly taken off of the lines, indicating that sperm whales might have the ability to select the type of fish they depredate (Straley 2005). Presumably, longliners have made it easier for sperm whales to forage by hauling their natural prey items closer to the surface. In general, lone males or small groups (2-7 individuals) participate in depredation activities (Purves et al. 2004, Hill and Mitchell 1998). However, the numbers may be larger at some sites and perhaps increasing. To date, all animals identified by eye (and by genetic sex determination in Alaska have been large subadults or adult males (Straley 2005).

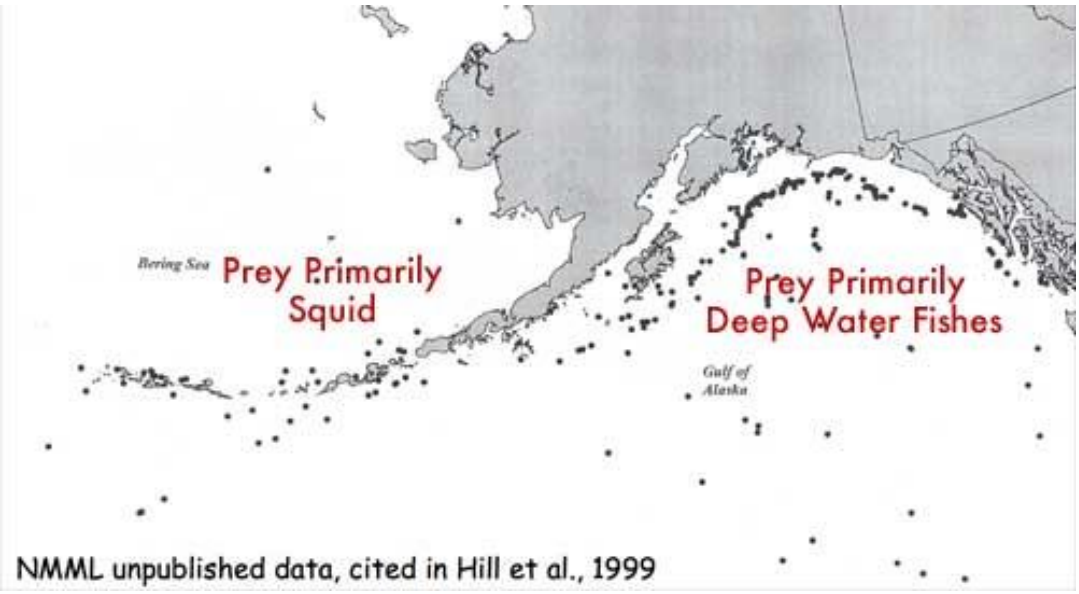

Figure 28. Sperm whale sightings, 1958-1995.

The length of time from the onset of longline fishing in an area, to the first reports of depredation, to depredation being widespread has been reported. Examples can be drawn from Alaska where longlining began in the late 1800's, expanded to the GOA in 1982, and the first reported case of depredation occurred in1978 (T. O'Connell unpublished data). However, widespread reports of depredation did not occur until after 1997, after a transition from a "derby" style to IFQ fishing in 1995. Concomitantly, the fishing season increased from 10 days to 8.5 months, overlapping with the summer months during which sperm whales presence in the GOA increases by a factor of two (Mellinger et al. 2004). Longline fishing operations appear to provide an easier foraging method for sperm whales presumably because the whales remove fish as the line is hauled reducing time at depth (Thode et al. 2004). Much of the documentation of sperm whale depredation includes unpublished, anecdotal reports.

b. WHALE DETERRENT WORK IN PROGRESS[18] and e. ONGOING ACOUSTIC RESEARCH FOR AVOIDING WHALE DEPREDATION

Prevention and mitigation is likely to be most successful when the costs of fishing are greater than the benefits, risks to sperm whales are high, the association between the fishing vessel and food can be broken, and/or the opportunity for interaction is reduced by separating fishing and whales in space and/or time. *Interesting exceptions to the rules – areas where there is longline fishing but no sperm whale depredation – includes the eastern AI and BS.*

[18] Source: 2008 SAFE Report sablefish chapter and SEASWAP http://www.seaswap.info/background/spermwhales.html

Thode et al. (2007) report on the use of passive acoustic recorders attached to anchor lines indicate that cavitation arising from changes in ship propeller speeds is associated with interruptions in nearby sperm whale dive cycles and changes in acoustically derived positions. This conclusion has been tested by cycling a vessel engine and noting the arrival of whales by the vessel, even when the vessel is not next to fishing gear. No evidence of response from activation of ship hydraulics or fishing gear strum has been found to date.

In 2003 the Southeast Alaska Sperm Whale Avoidance Project (SEASWAP) was created to investigate this issue with the long-term goal of reducing depredation. A collaborative study between fishermen, scientists and managers, SEASWAP works with both the coastal fishing fleet and the federal sablefish survey to collect various quantitative data on longline depredation using the shape of the flukes as a unique identifier, SEASWAP found that at least 106 individual sperm whales have been involved in depredation. Bayesian mark-recapture analyses estimate at least 123 ([94-174]; 95% credible interval) depredating whales in the GOA study area.

In a second experiment, passive deterrent gear using small, acrylic beads attached near each hook were not effective. The SEASWAP team is working with Central Bering Sea Fisherman's Association and NOAA Bycatch Reduction Program to investigate active deterrents, including acoustic playbacks and bubblers are ongoing and continue further testing of decoy buoys.

c. CANADIAN SABLEFISH GEAR USAGE AND PRICING BY GEAR TYPE

Information from a Canadian Sablefish Association representative follows. The commercial quota for the 2013/2014 sablefish fishery off British Columbia is 1,863 mt for a fishing area equivalent to the Yakutat fishing area. They typically use conical pots, 60 inch on the largest side and set 1.5 mile long strings, with 65 pots/ string and a 4 day soak time limit. They have electronic monitoring. Traps are required to have 3.5 inch escape rings, although many fishermen use a larger sized ring to retain bigger fish and release smaller fish for market reasons; they soak the pots for 1 – 2 days so smaller fish get out. They may retain halibut if they have the ITQs to cover the harvest, but very few halibut are caught in the pots because of fishing location and depth of fishing.

The sablefish fishery had been roughly 80% pots/20% longline, but is now approximately 50% pots/50% longline; this change is likely due to the integration of the BC groundfish fisheries in 2006 and due to a declining sablefish TAC over the past five years. It is not practicable to switch between pot longline and hook-and-line longline at sea, due to cost in time and efficiency reconfiguring vessels from one gear to another. For the few who fished both gears, they typically switched back to hook-and-line longline gear in shallower water. They do not yet have the same sperm whale problems as occurs off Alaska; however encounters do occur within the long-line fleet. The longline fishery is naturally separated from pot boats because longliners want to fish combination trips shallower than 250 fathoms, so there are no gear conflicts, as halibut are found shallower and sablefish are found deeper. Sablefish pot vessels range between 55 – 95ft and will carry approximately 450-750 pots, with 6-8 strings per vessel.

f. STATUS OF THE GOA SABLEFISH STOCK

Rather than include soon to be outdated information from the 2012 GOA sablefish stock assessment[19], a summary of the latest assessment will be included in the Environmental Assessment supporting the proposed action, which will be prepared in 2014 pending Council action. The 2013 status of the sablefish stock also will be reviewed by the Council under its groundfish specifications agenda item in December 2013.

g. STATUS OF THE GOA PACIFIC HALIBUT STOCK

Rather than include soon to be outdated information from the 2012 IPHC Pacific halibut stock assessment[20], a summary of the latest assessment will be included in the Environmental Assessment supporting the proposed action, which will be prepared in 2014 pending Council action. The 2013 status

[19] http://www.afsc.noaa.gov/REFM/Docs/2012/GOAsablefish.pdf
[20] http://www.iphc.int/publications/bluebooks/IPHC_bluebook_2013.pdf

of the halibut stock also will be reviewed by the Council under its IPHC agency report agenda item in February 2014.

NEXT STEPS

After its review of this discussion paper the Council may identify the purpose and need for management action to initiate an Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) for a combined FMP/regulatory amendment to allow the use of pots in the GOA. Based on previous Council and committee discussion, staff has drafted the following problem for Council consideration.

Whale depredation on hook-and-line longline gear is increasing in the Gulf of Alaska sablefish IFQ fishery. The additional sablefish mortality associated with whale depredation of longline gear is difficult to quantify, but likely increases total mortality and reduces the viability of the population. Entanglement of seabirds and whales (some of which are listed under the Endangered Species Act) in longline gear could be reduced if fishermen were allowed to use longline pot gear. Bycatch of Pacific halibut and rockfishes also could be reduced.

Table 12 constitutes committee recommendations for framing the action alternative (the status quo is the no action alternative) and options to amend the FMP and Federal regulations (highlighted in bold). Note that the most management options are associated with the measure to require removal of pot gear from fishing grounds when not being actively fished in order to reduce grounds preemption and gear conflict. Additional committee discussion or public testimony could narrow or revise the options either prior to or after preparation of the initial review draft of a proposed analysis. For the analysis to proceed, additional specificity should be added to two of the options (?% of IFQ remaining, ? days to deliver).

Two committee recommendations for gear modifications would be served by additional public comment and Council direction. Proposed requirements to mark both ends of the pot longline and use neutrally buoyant groundline have been proposed for the use of sablefish pots in the GOA. Such requirements would create a new gear definition and code unique to sablefish pots in the GOA. These proposed gear modifications may make it harder for fishermen to use the same gear either for groundfish in the GOA (i.e., for Pacific cod) and/or for groundfish (including sablefish) in the BS, AI, or northwest. It also could create a conflict with a State of Alaska definition for groundfish pot gear. If the Council wishes to proceed with further analysis of these recommendations staff requests clarification on what unique circumstances warrant such requirements only for the GOA sablefish pot fishery (compared with GOA "cod" pots or even BSAI sablefish pots). If these proposed gear modifications would be best applied to all pots in all areas, then the Council may wish to consider initiating a separate action to apply those proposed requirements to all groundfish pots in all areas; this course of action would avoid creating a new gear code although it would create a conflict with the State definition for groundfish pots.

The remaining issues that are not identified in Table 12 for inclusion in the proposed analysis (because they would not be implemented in Federal regulations) would be incorporated into the appropriate sections of the EA/RIR/IRFA.

Table 12. Summary of Sablefish Gear Committee recommendations for analysis.

Topic	Issues Discussed	Action Alternative	Option 1	Option 2	Option 3	Option 4
Area		**GOA**				
Gear restrictions	**single vs longline pots**	**longline pots**				
	pots retained on grounds for long soaks vs retrieved during deliveries	**remove longline pots from fishing grounds at end of fishing trip**	**none**	**remove longline pots from fishing grounds at the end of a trip (allow exceptions for weather/ safety)**	**remove pot longline gear unless sufficient amount of IFQs associated with the vessel remain (e.g., > 10% IFQ remaining)**	**require delivery within X days of deploying longline pot gear**
	pot storage					
	pot soak time					
	gear configuration requirements	gear requirements	none	mark both ends of longline*		
	gear conflicts/ between all gear types					
	use the 200 fathom depth contour to					
	pre-emption of fishing grounds due to lost gear					
	cost of gear conversion from longline					
	vessel demographics: vessel size by area and quota share size by area					
	biodegradability of twine used for escape ports at sablefish fishing depths					
	wider range of voluntary gear location					
	neutrally buoyant groundline	gear requirements	none	neutrally buoyant groundline*		
	pot limits	**pot limits**	**none**	**200 - 400**		
Halibut	exacerbation of halibut mortality					
	shifting predation to halibut					
	halibut bycatch by different pot					
Social/ economic effects	safety issue related to use of pots by small vessels					
	crew employment					
	QS prices					
Other	whale depredation and interactions					
	whale deterrent work in progress					
	Canadian sablefish gear usage and pricing by gear type					
	review of current literature on whale					
	status of the GOA sablefish stock					
	status of the GOA halibut stock					
	halibut retention in sablefish pots	require retention of halibut in sablefish longline pots**	none	require retention of halibut in sablefish longline pots**		
*may require a new gear code for sablefish pots or require recommended marking on all pot gear (which is outside the scope of this action)						
**also would require complementary action by IPHC						

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Preparers

Jane DiCosimo
NPFMC

Megan Peterson
University of Alaska Fairbanks

Persons Consulted

David Witherell
NPFMC

Chris Lunsford, Dr. Dana Hanselman, Cara Rodgveller, Dr. Mike Sigler
AFSC-TSMRI (ABL)

Josh Keaton, Mary Furuness
NMFS AKRO

Karla Bush, Kristen Green
ADF&G

Tory O'Connell
Sitka Sound Science Center

IFQ Implementation Committee

GOA Sablefish Gear Committee

Enforcement Committee

APPENDIX 1. SABLEFISH LONGLINERS

Background: The sablefish fixed gear fishery (together with the fixed gear halibut fishery) has been managed under the individual fishing quota (IFQ) program since 1995. Under this program, only persons holding quota shares are allowed to make commercial landings of sablefish. There are several key provisions of the program: the process for initial allocation of QS by regulatory area; assignment of shares to vessel categories; share transfer provisions; use and ownership provisions; QS blocks to ensure small allocations are available for entry; the annual process for allocating QS; and the establishment of halibut and sablefish Community Development Quotas (CDQ).

Jeb Morrow

Fishery Management: The sablefish longline fleet has the potential to be constrained by seabird "takes". USFWS has issued an incidental take limit of endangered short-tailed albatross of 4 birds during a two-year period in the longline groundfish fisheries and two birds during a two-year period in the longline Pacific halibut fisheries. Current regulations require all longline vessels greater than 55′ in length to use paired streamer lines. Longline vessels 26′ to 55′ in length are required to use either a single streamer or a buoy bag, depending on the fishing location.

Since implementation of the IFQ program in 1995, the sablefish longline fishery has been exempted from halibut PSC limits. Legally retainable halibut taken while fishing with hook and line gear must be retained and counted against a person's halibut IFQ, if anyone onboard has unused halibut IFQ.

Gear Used: The sablefish fisheries are prosecuted with stationary lines, onto which baited hooks are attached. Gear components that contact the bottom include the anchors, groundline, gangions, and hooks. In the sablefish fishery, anchors are two-prong standard 50 lb to 90 lb anchors, and groundlines are generally constructed of 3/8-inch sinking line, with 6"to 18" long gangions of #72 to #86 twine, spaced 30" to 48" apart, with 9/0- 15/0 circle hooks. Some catcher vessels use snap-on gear with gangions spaced at 3′ to 4′ intervals. On catcher vessels, an average set consists of 20 skates of groundline, with each skate 100 fathoms to 150 fathoms long. Preferred baits are squid, pollock, and herring. Automatic baiting machines are used on many vessels. 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 3/4-inch floating poly, and the upper shot of line is made of 5/8-inch sinking line. A buoy marks the beginning of a set, and a flag (up to 10′ high) typically marks the end of a set ("bag and flag" set-up).

Bill Wilson, NPFMC

To make a set, the first anchor is dropped and the boat steams ahead with the groundline and baited hooks being set off the stern of the boat. The set is not made in a straight line; instead 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. Fish are packed in the round, or bled and gutted, and put in the hold on ice or slush-ice. Catcher processors freeze headed and gutted sablefish.

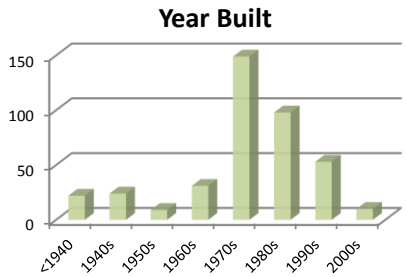
The sablefish longline fishery is prosecuted along the slope areas over gravel, cobble, and mud bottom at depths of 400 m to more than 1,000 m. This fishery is often a mixed halibut/sablefish fishery, with Greenland turbot, grenadiers, shortraker, rougheye, and thornyhead rockfish also taken.

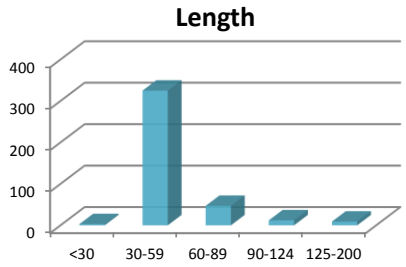
Vessels: In 2010, there were 397 vessels that participated in the sablefish IFQ and CDQ fisheries. Of this total, 17 vessels participated in CDQ fisheries and 389 in sablefish IFQ fisheries. About 90% (357 vessels) of the sablefish fleet also participated in the halibut IFQ fisheries. Pacific cod is the main component of the catch in this fleet due to participation of 17 freezer longliners.

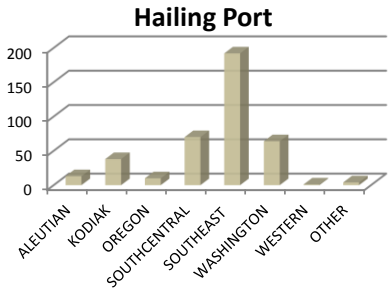
Rhonda Hubbard

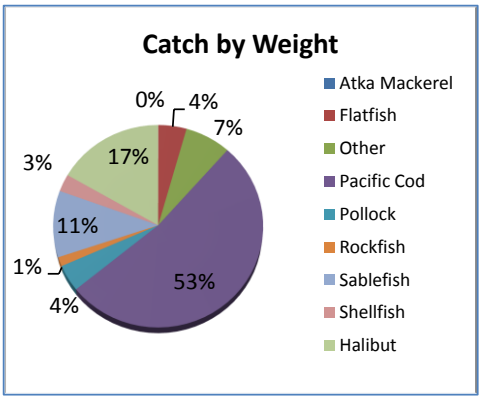
Economics: The fleet's primary target, sablefish, had an ex-vessel value of $91.9M in 2010. The fleet delivered to 25 different ports with the top three ports (Seward, Sitka and Kodiak) accounting for 40% of the landings. The average ex-vessel price per pound for sablefish was $3.66, an increase of 75¢ from the prior year.

Herman Savikko, ADF&G

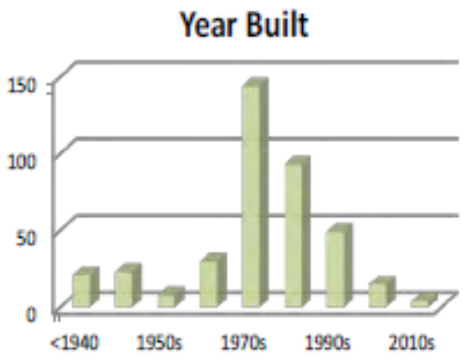


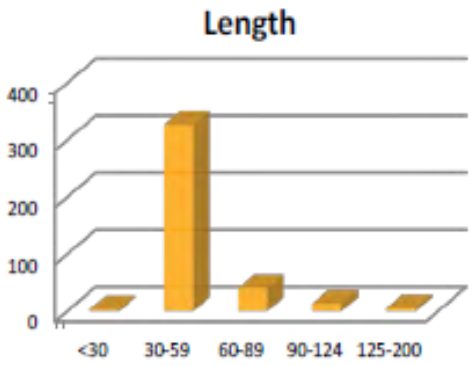


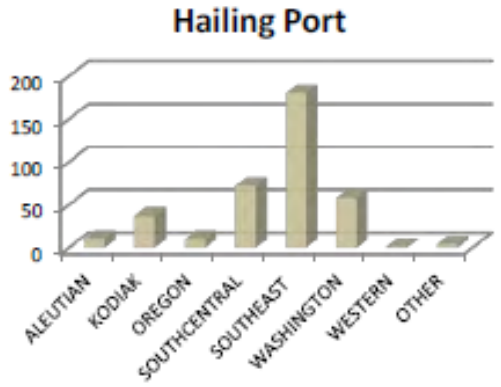


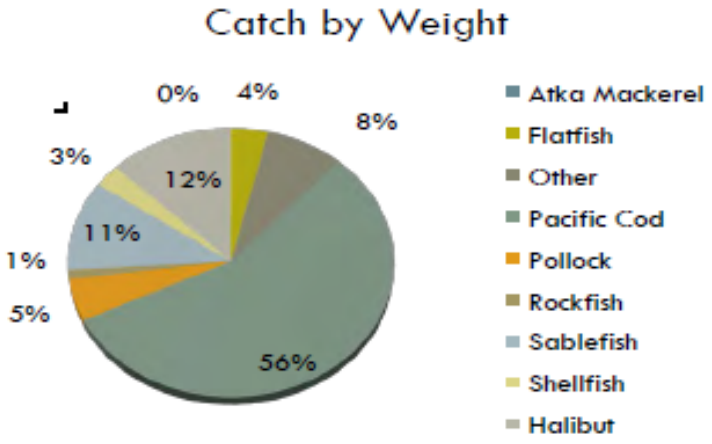


Sablefish Fleet









**NOTES

Fleet determined by a retained sablefish permitted landing. Includes CDQ Sablefish and IFQ Sablefish.

*387 total vessels
*13 vessels landed CDQ Sablefish
*386 vessels landed IFQ Sablefish
*15 vessels are also in the CP Hook and Line Fleet
*45 vessels are also in the CV Hook and Line Fleet
*30 vessels are also in the GF Pot Fleet
*3 vessels are also in the Jig Fleet
*1 vessels are also in the CG Trawl Fleet
*3 vessels are also in theWG Trawl Fleet
*352 vessels are also in the Halibut IFQ Fleet
*6 vessels are also in the Crab Fleet
*10 vessels are also in the Halibut CDQ Fleet

Fishing Fleet Profiles Addendum 10/10/2012

APPENDIX 2

HALIBUT AND SABLEFISH IFQ PROGRAM
AMENDMENT PROPOSAL
North Pacific Fishery Management Council
Fax: (907) 271-2817

Name of Proposer: Michael Douville Date: 3/31/06
Address: Po Box 68 CRAig, AK 99921
Telephone: 907 826 3407 Email: MYRNAMIKE@Hotmail.com

Brief Statement of Proposal:
To allow for the use of pots in the Gulf of Alaska southeast sablefish/blackcod fishery.

Objectives of Proposal (What is the problem?):
Provide fishermen an alternative type of gear to longline.

Need and Justification for Council Action (Why can't the problem be resolved through other channels?):
This proposal can address several problems which the Council is working on:
a) sea bird by-catch
b) interaction with whales

Foreseeable Impacts of Proposal (Who wins, who loses?):
There will be no negative impact on anyone. As an allowable gear type, fishermen could chose to use pots, but would not be required to invest, if they are happy with long line gear.
However, the use of pots could lead to a decline in bird by-catch, including albatross, and a decrease in fishing gear/whale activity. By catch of rock fish would also be reduced, less bait and man hours to catch the same amount of fish

Are there Alternative Solutions? If so, what are they and why do you consider your proposal the best way of solving the problem?
It is an excellent solution, because it provides a gear alternate opportunity for fishermen, and can lead to reductions in by-catch or unwanted marine mammal interaction.
The use of bird deterrent lines are cumbersome and unnecessary for many areas in Southeast Alaska. Research has demonstrated that whales will continue to take fish from longline gear.

Supportive Data and Other Information (What data are available and where can they be found?):
List of supportive data will follow

Signature: Michael Douville

MICHAEL L. DOUVILLE
P.O. BOX 68
CRAIG, AK 99921

PO BOX 68
CRAig, AK 99921