FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION
3rd SURVEILLANCE REPORT

For The

Alaska Sablefish Commercial fishery

Applicant Group

Alaska Seafood Marketing Institute

Assessors:

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I. Summary and Recommendations

The Alaska Seafood Marketing Institute, requested assessment of the Alaska sablefish (black-cod) commercial fisheries to the FAO Based Responsible Fisheries Management (RFM) Certification Program. The application was made in April 2010. Assessment commenced in April 2010 with assessment validation before proceeding to full assessment and final certification determination in October 2011.

This report is the 3rd Surveillance Report (ref: AK/SAB/001.3/2014) for the Alaska sablefish federal and state commercial fisheries following certification award against the FAO-Based RFM Program, awarded on October 11th 2011. The objective of the Surveillance Report is to monitor for any changes/updates (after 12 months) in the management regime, regulations and their implementation since the previous assessment; in this case the second surveillance report completed in November 2013. The Report determines whether these changes and current practices remain consistent with the overall scorings of the fishery allocated during initial certification.

In addition to this, corrective action plans resulting from non-conformances in the previous assessments are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. Also, any areas reported as “items for surveillance”, although not defined as formal non conformances, are explored as areas which could potentially cause a change (lower or higher) in the score of a given clause.

The certification covers the Alaskan sablefish *(Anoplopoma fimbria)* commercial fishery employing demersal longline, pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

The surveillance assessment was conducted according to the Global Trust Certification ISO 65 accredited procedures for FAO – Based Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria Version 1.2 fundamental clauses as the assessment framework.

The assessment was conducted by a team of Global Trust appointed assessors. Details of the assessment team are provided in Appendix 1.

The main Key outcomes have been summarized in Section 5 “Assessment Outcome Summary”.

II. Assessment Team Details

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1. Introduction

Unit of Certification

The sablefish (black-cod) commercial (federal and state) fisheries, employing demersal longline (mainly), pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management, underwent their 3rd surveillance assessment against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2 Fundamental clauses.

This 3rd Surveillance Report documents the assessment result for the continued certification of commercially exploited Alaska sablefish fishery to the FAO-Based RFM Certification Program. This is a voluntary program that has been supported by ASMI who wishes to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed according to the FAO-Based RFM Program.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification using the fundamental clauses of the FAO-Based RFM Conformance Criteria Version 1.2 (Sept 2011) in accordance with EN45011/ISO/IEC Guide 65 accredited certification procedures. The assessment is based on the fundamental clauses specified in the FAO-Based RFM Conformance Criteria.

The assessment is based on 6 major components of responsible management derived from the FAO Code of conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labeling of products from marine capture fisheries (2009).

A The Fisheries Management System
B Science and Stock Assessment Activities
C The Precautionary Approach
D Management Measures
E Implementation, Monitoring and Control
F Serious Impacts of the Fishery on the Ecosystem

These six major components are supported by 13 fundamental clauses (+ 1 in case of enhanced fisheries) against which a capture fishery certified under the FAO-Based RFM Program is assessed during a surveillance assessment.

A summary of the site meetings is presented in Section 5. Assessors comprised of both externally contracted fishery experts and Global Trust internal staff (Appendix 1).

This report documents the 3rd Surveillance Assessment (2013) of the Alaska sablefish commercial federal and state fisheries, originally certified on October 11th 2011, and the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

1.1. Recommendation of the Assessment Team

Following this 3rd Surveillance Report in 2014 the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the sablefish (black cod) commercial federal and state fisheries, employing demersal longline, pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

2. Fishery Applicant Details

Applicant Contact Information			
Organization/ Company Name:	**Alaska Seafood Marketing Institute**	Date:	**April 2010**
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Street :	**311 N. Franklin Street**		
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3. Unit of Certification

Unit of Certification			
U.S. ALASKA SABLEFISH (Black Cod) COMMERCIAL FISHERIES			
Fish Species (Common & Scientific Name)	**Geographical Location of Fishery**	**Gear Type**	**Principal Management Authority**
Sablefish (black-cod) *(Anoplopoma fimbria)*	Federal and state fisheries in the Gulf of Alaska and Bering Sea & Aleutian Islands.	Benthic longline, Pot, Bottom Trawl.	National Marine Fisheries Service (NMFS); North Pacific Fishery Management Council (NPFMC); Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF).

4. Surveillance Meetings

Organization	Time, day and location	Items discussed at the NPFMC meetings
North Pacific Fishery Management Council (NPFMC)	Monday 6th of October 2014, Hilton Hotel, Anchorage, AK, USA.	• C1 Observer Deployment Plan • C2EM Study Design
North Pacific Fishery Management Council (NPFMC)	Tuesday 7th of October 2014, Hilton Hotel, Anchorage, AK, USA.	• C4 Groundfish Specs • C5 GOA Skate MRA • Enforcement Committee
North Pacific Fishery Management Council (NPFMC)	Wednesday 8th of October 2014, Hilton Hotel, Anchorage, AK, USA.	• D4 Bering Sea Fishery Ecosystem Plan (FEP) • D5 EFH 5 year Review • C6 MRA Enforcement • C7 GOA Trawl Bycatch Management • SSL Critical Habitat Workshop
North Pacific Fishery Management Council (NPFMC)	Thursday 9th of October 2014, Hilton Hotel, Anchorage, AK, USA.	• C7 GOA Trawl Bycatch Management continued • C4 Groundfish Specs
North Pacific Fishery Management Council (NPFMC)	Friday 10th of October 2014, Hilton Hotel, Anchorage, AK, USA.	• C5 GOA Skate MRA • C6 MRA Enforcement • D4 Bering Sea Fishery Ecosystem Plan (FEP)

Stakeholder Submissions: The Alaska Seafood Marketing Institute website provides an opportunity for stakeholders to provide information that relevant for the full assessment or surveillance audit of fisheries within the Alaska FAO Based Responsible Fisheries Management Certification Program. All scientific, objective information relative to the assessment provided to the assessment team is used as part of the assessment and referenced for transparency at the end of the report.

5. Assessment Outcome Summary

Fundamental Clauses Summaries

Clause 1: Structured and legally mandated management system

Evidence adequacy rating: High

The U.S. Alaska sablefish commercial fishery is managed by the North Pacific Fishery Management Council (NPFMC) and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, the Alaska sablefish fishery is managed through the NPFMC's Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The FMPs established an Individual Fishing Quota (IFQ) management program for this fishery. State sablefish fisheries are managed outside the IFQ program using a Guideline Harvest Level (GHL).The US Coast Guard and the Alaska Wildlife Troopers enforce fisheries regulations in federal and state waters respectively.

Clause 2: Coastal area management frameworks

Evidence adequacy rating: High

The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. These include decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. With regards to conflict avoidance and resolution between different fisheries, the North Pacific Fishery Management Council (NPFMC) and the Board of Fisheries (BOF) tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance of potential fisheries conflicts.

Clause 3: Management objectives and plan

Evidence adequacy rating: High

The Magnuson Stevens Fishery Conservation and Management Act (Magnuson Stevens Act, MSA) is the primary domestic legislation governing management of the nation's marine fisheries. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the sablefish fisheries in those regions. Both FMPs present long-term management objectives for the Alaska sablefish fishery. In state waters (0-3 nm), five Alaska sablefish fisheries are managed by

ADFG and the BOF outside the IFQ program using a Guideline Harvest Level (GHL). The Aleutian Islands District and Western District of the South Alaska Peninsula Area Sablefish Management Plan (5 AAC 28.640) governs the harvest of sablefish in the Area as described in 5 AAC 28.555(b). 5 AAC 28.360 defines the Cook Inlet Sablefish Management Plan. Sablefish harvest, possession, and landing requirements for Prince William Sound Area are governed under 5 AAC 28.272. Southeast Alaska State managed sablefish (Chatham and Clarence strait) regulations are specified under 5 AAC 28.160 in the Groundfish Commercial Fisheries Regulations. These regulations document long term management objectives for these fisheries.

Clause 4: Fishery data

Evidence adequacy rating: High

The NMFS and ADFG collect fishery data and conduct fishery independent surveys (longline and trawl) to assess the sablefish populations and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. The NMFS/AFSC conducts annual sablefish longline surveys on the continental slope of the eastern Bering Sea, Aleutian Islands, and the GOA. In state waters, fishery independent data come from longline and trawl surveys as well as mark-recapture studies in the NSEI. Fishery dependent data are collected from fixed gear (longline and pot) vessels which target sablefish in the federal IFQ fishery and trawl fisheries that catch sablefish as retained bycatch in other fisheries such as rockfish and sole. Records of catch and effort for these vessels are recorded through the e-landing (electronic fish tickets) catch recording system and also collected by observers and by vessel captains in voluntary and required logbooks. A new Observer Program designed to expand coverage to vessels less than 60 feet long and to provide more flexibility to meet management needs was implemented in 2013 and continued in 2014. These data provide sufficient information for indices used in the stock assessment model.

Clause 5: Stock assessment

Evidence adequacy rating: High

The mission of the NMFS/AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The updated point estimates of B40%, F40%, and F35% from the December 2013 SAFE sablefish assessment are 106,361 t (combined across the EBS, AI, and GOA), 0.094, and 0.112, respectively. Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of B40%), placing sablefish in sub-Tier "b" of Tier 3. Apart from new data, there are no model changes in 2013 relative to 2012. ADFG annual longline research surveys began in 1988 in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Mark-recapture studies for sablefish are also carried out in NSEI. The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The Aleutian Island fishery is set as 5% of the BSAI federal TAC. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Ecosystem considerations for this fishery are reported in the sablefish SAFE report.

Clause 6: Biological reference points and harvest control rule

Evidence adequacy rating: High

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The Tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. The limit reference point is ½ MSY or $B_{17.5\%}$. The probability that next year's spawning biomass will be below B35% was 0.89. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.95 (up from 0.7 last year), and the probability of staying below B40% is near 100%. In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA. The harvest control rule applied to sablefish is recognized as being effective at maintaining the stock at a biomass capable of producing maximum sustainable yield. When stock size falls below a target, the harvest rate is reduced to promote rebuilding to the target. The current biomass of sablefish is estimated to be below the B40% target, and consequently the TAC for the next year will be determined by the rule in Tier 3b, e.g. the harvest rate will be below the maximum allowed.

Clause 7: Precautionary approach

Evidence adequacy rating: High

The first element of the precautionary approach is the Optimum Yield (OY) for the groundfish complexes in the Bering Sea / Aleutian Islands (BSAI) and the GOA as a range of numbers. The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. The second element of precautionary approach is the Tier system, based on knowledge and uncertainties of the stock in question. NPFMC inaugurated the Tier system in fisheries management: the harvest control rule depends on the amount of information available. The less the information about a given stock, the more conservative is the catch allowed. The third element of the precautionary approach is the ACL, OFL, ABC and TAC system. Allowable Biological Catch (ABC) is a scientifically acceptable level of harvest based on the biological characteristics of the stock and its current biomass level. Overfishing Level (OFL) is a limiting catch level, corresponding to fishing at MSY level, higher than ABC, which demarcates the boundary beyond which the fishery is no longer viewed as sustainable. In application, the NPFMC sets TAC ≤ ABC < OFL. Bycatch from a given stock is limited by a Maximum Retainable Bycatch amount (MRB), which is determined as a percentage of retained catch (not including arrowtooth flounder). Alternatively, Prohibited Species Catches (PSC) limits close fisheries when reached.

Clause 8: Management measures

Evidence adequacy rating: High

The federal sablefish fishery is managed under an Individual Quota System (IFQ). Under the major State managed sablefish fisheries, the use of an equal quota share system is very much like individual fishery quotas, and produces the same efficiencies. The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify Annual Catch Limits (ACLs) with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)) and to subsequently account for whatever catches, bycatch or discards previously unaccounted. The Federal FMP for the BSAI and GOA list the fishery closures that are in place throughout Alaska. These closures apply to different vessels and gear types. The NMFS and the ADFG have well-established regulations on fishing seasons and legal gear use. Longline, trawl and pot gear are all regulated to increase selectivity of the target species and to avoid bycatch and discards. In addition to this, management measures and operational methods (i.e. MRB, PSC) are in place to account for bycatch and discards of encountered bycatch species.

Clause 9: Management measures to produce maximum sustainable levels

Evidence adequacy rating: High

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$*. Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of B40%), placing sablefish in sub-tier "b" of Tier 3. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC ≤ ABC < OFL. The harvest control rule is designed to ensure the population is capable of producing MSY.*

Clause 10: Appropriate standards of fisher's competence

Evidence adequacy rating: High

Any aspirant sablefish fisherman must have 150 days of sablefish fishing experience before being able to purchase sablefish IFQs. Obtaining sablefish IFQ share most often will require the purchaser to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. Several training opportunities are available to train crew members in Alaska.

Clause 11: Effective legal and administrative framework

Evidence adequacy rating: High

The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska federal fisheries laws and regulations, especially 50CFR679. The federal violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). The Alaska Wildlife Troopers (AWT) enforce state regulations.

Clause 12: Framework for sanctions

Evidence adequacy rating: High

The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations: ***1)*** *Issuance of a citation (a type of warning), usually at the scene of the offense,* ***2)*** *Assessment by the Administrator of a civil money penalty,* ***3)*** *for certain violations, judicial forfeiture action against the vessel and its catch,* ***4)*** *Criminal prosecution of the owner or operator for some offenses. In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA.The Alaska Wildlife troopers enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation*.

Clause 13: Impacts of the fishery on the ecosystem

Evidence adequacy rating: High

The NPFMC and NOAA/NMFS conduct assessments and research related to fishery impacts ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document, annual Ecosystem Considerations documents, and the various other research reports. The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that the benthic longline and pot fisheries have minimal or temporary impacts on sablefish habitat. Various studies have applied ecosystem models to food webs and impacts of climate change. Sablefish have low discard rates in other fisheries. The directed sablefish fishery takes significant amounts of grenadiers, arrowtooth flounder, spiny dogfish, sharks and some rockfish; but the fishery does not pose a threat to bycatch species. Management measures limit interactions with seabirds and the fishery has minimal impact on the short-tailed albatross, the only seabird listed as endangered under the ESA. Interactions with whales remain a problem as they take fish off longline gear, but the fishery does not adversely affect whale populations.

6. Conformity Statement

The Assessment Team recommends that continued certification under the FAO Based Responsible Fisheries Program is granted to the Alaska sablefish (*Anoplopoma fimbria*) federal and state commercial fisheries employing demersal longline (mainly), pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

7. FAO-Based Conformance Criteria Fundamental Clauses for Surveillance Reporting

A. The Fisheries Management System

1. There shall be a structured and legally mandated management system based upon and respecting International, National and local fishery laws, for the responsible utilization of the stock under consideration and conservation of the marine environment.

FAO CCRF 7.1.3/7.1.4/7.1.9/7.3.1/7.3.2/7.3.4/7.6.8/7.7.1/10.3.1

FAO Eco 28

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating determination

No significant change has occurred in the management of sablefish in Alaska since 2013. The U.S. Alaska sablefish commercial fishery is managed by the North Pacific Fishery Management Council (NPFMC) and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, the Alaska sablefish fishery is managed through the NPFMC's GOA and BSAI Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The FMPs established an Individual Fishing Quota (IFQ) management program for this fishery. State sablefish fisheries are managed outside the IFQ program using a Guideline Harvest Level (GHL).The US Coast Guard and the Alaska Wildlife Troopers enforce fisheries regulations in federal and state waters respectively.

The NPFMC recommends regulations to govern the directed sablefish fisheries and makes allocation decisions among sablefish users and user groups in federal waters off Alaska. NPFMC sablefish management measures include a Total Allowable Catch (TAC) which is divided among gear types [trawl and fixed (longline and pot) gear] and an Individual Fishing Quota (IFQ) program is used for the majority of the TAC taken by the fixed gear fleet. Fixed gear (mainly longlines, but also pots) harvests around 90% of the sablefish quota and trawl gear about 10%. In fact, in 2014 fixed gear harvested 12,604 tons of sablefish while trawl gear harvested 1,038 tons.

The NMFS conducts stock surveys, stock assessment reports and a multitude of biological and environmental studies, and in connection with the United States Coast Guard (USCG) enforces fisheries regulations. NOAA's Alaska Fisheries Science Center (AFSC) annually assesses the abundance of sablefish through longline surveys. The groundfish trawl survey is also used to gauge sablefish abundance. Fishery dependent data also collected by on-board fishery observers and through required and voluntary logbook programs. The NMFS has been tagging and releasing sablefish in Alaska waters since 1972 to study movements, evaluate apportionment for quota, validate aging methods and examine growth. In 1995, NPFMC and the NMFS implemented an IFQ system for the Alaska sablefish and halibut fisheries. These agencies, and all of their activities and

decisions, are subject to the Magnuson Stevens Act (MSA) which is the primary domestic legislation governing management of the United States marine fisheries and requires the creation of FMPs.

http://www.fakr.noaa.gov/npfmc/

In state waters (0-3 nm), five sablefish state fisheries are managed by the ADFG and the BOF outside the IFQ program. Two minor state fisheries are in Cook Inlet and the Aleutian Islands managed using a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey for the area. Three major state fisheries exist which are limited entry and are located in Prince William Sound, Chatham and Clarence Strait. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For the Clarence and Chatham Strait fisheries an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population. In addition, in Chatham Strait an annual stock assessment is performed which includes a mark-recapture estimate of the population abundance.

Sablefish are caught primarily with longline gear in Alaska; however, the Clarence Strait area has both a season for pot and longline gear. The Aleutian Islands state fishery allows longline, pot, jig, and hand troll gear, and one trawl vessel qualifies for the limited entry program in Prince William Sound. In federal waters, sablefish are primarily caught in directed fisheries on longline gear; however, an increasing trend toward pot gear exists due to whale depredation of sablefish on longline gear. Pots are longlined with approximately 40-135 pots per set. In addition, sablefish are caught as bycatch in trawl fisheries. Trawl fisheries are assigned sablefish quota since they intercept sablefish in the course of targeting other fisheries (e.g. pacific cod, flatfish etc…). The Alaska Wildlife Troopers (AWT) enforce fisheries regulations in state waters.

http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management

The NPFMC and NMFS produce annual Stock Assessment & Fishery Evaluation (SAFE) reports for each fishery under federal jurisdiction, including Alaska sablefish. Both state and federal assessment biologists meet at the NPFMC Plan Team meetings and share assessment information and harvest strategies to assure conservation management over the entire stock distribution. The NPFMC provides a great deal of information on their website, including meeting agendas, discussion papers, and records of decisions. The Council actively encourages stakeholder participation, and all Council deliberations are conducted in open, public session. Similarly, ADFG conducts stock assessments in State waters to determine safe harvest levels. The BOF process is transparent, and open to all stakeholders. Anyone may submit regulatory proposals, and all such proposals are given due consideration by the BOF.

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

New for 2014

Area 4A Pots. The Council also initiated a regulatory amendment to follow up on its April 2013 recommendation that the IPHC allow the retention of halibut in Area 4A that are harvested incidentally in sablefish pots in the BSAI when IFQs are held to cover the harvests of both species. The Council informed the IPHC that Federal regulations would need to be amended to identify pots as legal gear for halibut, at a minimum. The Council also reported that it may consider implementation of a discard mortality rate and/or maximum retainable allowance for this fishery. The IPHC supported the concept in principle and directed that IPHC staff assist with the Council's continued development of accompanying Federal regulations provided that the Council analyzes methods to: 1) limit the directed fishing for halibut using pot gear; 2) consider appropriate methods for the timing of pot removal; and 3) the marking of buoys (radar reflectors). The IPHC would schedule action to revise its definition of legal gear, after it reviewed the proposed additional limitations on the use of the gear at a future IPHC annual meeting. Federal regulations from Council action and IPHC annual management measures would need to be implemented simultaneously.

http://www.npfmc.org/wp-content/PDFdocuments/newsletters/news214.pdf

2. Management organizations shall participate in coastal area management institutional frameworks, decision-making processes and activities related to the fishery and its users, in support of sustainable and integrated resource use, and conflict avoidance.

FAO CCRF 10.1.1/10.1.2/10.1.4/10.2.1/10.2.2/10.2.4

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

No significant change has occurred since the previous surveillance assessment in 2013.

The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. These include decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. With regards to conflict avoidance and resolution between different fisheries, the North Pacific Fishery Management Council (NPFMC) and the Board of Fisheries (BOF) tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance of potential fisheries conflicts.

NEPA and ACMP

The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. These include decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The state of Alaska is a cooperating agency in the NEPA process for federal actions, giving it a seat at the table for federal actions. The NEPA process is essentially a biological/environmental, and socio-economic impact assessment where proposed options for significant developments and/or changes in current management practices are evaluated, before a final decision is taken. One of the latest NEPA analyses has seen the restructuring of the observer program to cover the previously unobserved vessels less than 60 feet LOA participating in sablefish and halibut harvest.
http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2013.pdf

The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. Fisheries are relevant to the NEPA process in two ways. First, each NPFMC fisheries package must go through the NEPA review process. Second, any project that could impact fisheries (i.e., oil and gas, mining, coastal construction projects, etc.,) that is either on federal lands, in federal waters, receives federal funds or requires a federal permit, must go through the NEPA process. In this manner, both fisheries and non-fisheries projects that have a potential to impact fisheries have a built in process by which concerns of the NPFMC, NMFS, state agencies, industry, other stakeholders or the public must be accounted for.

DEC

The Alaska Department of Environmental Conservation (DEC) implements statutes and regulations affecting air, land and water quality. DEC is the lead state agency for implementing the federal Clean Water Act and its authorities provide considerable opportunity to maintain high quality fish and wildlife habitat through pollution prevention (http://dec.alaska.gov/).

ADFG

ADFG protects estuarine and marine habitats primarily through cooperative efforts involving other state and federal agencies and local governments. ADFG has jurisdiction over the mouths of designated anadromous fish streams and legislatively designated state special areas (critical habitat areas, sanctuaries and refuges). Some marine species also receive special consideration through the state Endangered Species program.

DNR

The Alaska Department of Natural Resources (DNR) manages all state-owned land, water and natural resources except for fish and game. This includes most of the state's tidelands out to the three mile limit and approximately 34,000 miles of coastline. DNR authorizes the use of log-transfer sites, access across state land and water, set-net sites for commercial gill net fishing, mariculture sites for shellfish farming, lodge sites and access for the tourism industry, and water rights and water use authorizations. DNR also uses the state Endangered Species Act to preserve natural habitat of species or subspecies of fish and wildlife that are threatened with extinction (http://dnr.alaska.gov/).

USFWS

The U.S. Fish and Wildlife Service (USFWS) is a bureau within the Department of the Interior. Its objectives include 1) Assisting in the development and application of an environmental stewardship ethic, based on ecological principles, scientific knowledge of fish and wildlife, and a sense of moral responsibility; 2) Guide the conservation, development, and management of the US's fish and wildlife resources. 3) Administer a national program to provide the public opportunities to understand, appreciate, and wisely use fish and wildlife resources. The USFWS functions include enforcement of federal wildlife laws, protection of endangered species, management of migratory birds, restoration of nationally significant fisheries, conservation and restoration of wildlife habitat such as wetlands, help of foreign governments with their international conservation efforts, and distribution of hundreds of millions of dollars, through the Wildlife Sport Fish and Restoration program, in excise taxes on fishing and hunting equipment to State fish and wildlife agencies (http://www.fws.gov/help/about_us.html).

ANILCA

The Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources management, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/).

BOEM

The Bureau of Ocean Energy Management (BOEM) (previously Minerals and Management) is responsible for managing environmentally and economically responsible development and provide safety and oversight of the offshore oil and gas leases. The activities of BOEM and the process for application and approval of oil exploration permits overlaps extensively with evaluations by ADNR, ADFG and ADEC given the potential impacts of such activities on anadromous and other marine resources and their habitat. An example of this is provided by the *Cook Inlet Offshore Oil & Gas Exploration Permit Application & Approval Process* available at: http://dog.dnr.alaska.gov/Permitting/Documents/Arcadis/Arcadis_Flowchart_CookInletOffshore_Draft.pdf

OPMP

The Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. Because of the complexity and potential impact of these projects on multiple divisions or agencies, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. The office deals with a diverse mix of projects including transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/).

The assessment team considers that the collectivity of: the NEPA process, existing agencies and processes (e.g. ADFG, ADEC, DNM, USFWS, ANILCA OPMP, and BOEM), and the existing intimate and routine cooperation between federal and state agencies managing Alaska's coastal resources is capable of planning and managing coastal developments in a transparent, organized and sustainable way.

Conflict Avoidance in the fisheries sector

With regards to conflict avoidance and resolution between different fisheries, the NPFMC and the BOF tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. The NPFMC and the BOF also have a standing joint committee that meets to resolve management and allocation issues. The Council and BOF hold an annual coordinating meeting where members consider issues and hear testimony from stakeholders concerning joint Board/Council issues. Both entities provide a great deal of information on their websites, including meeting agendas, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance and resolution of potential fisheries conflicts. Alternatively courts of law provide resolution centers for any legal dispute. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register. The Council as part of their process assesses economic, social and cultural value of the fishery resources in order to assist decision-making, allocation and use.

In 2005, the AFSC compiled baseline socioeconomic information about Alaskan fishing communities in the first edition of *Community Profiles for North Pacific Fisheries – Alaska* (NOAA-TM-AFSC-160). Between 2010 and 2011, AFSC went through the process of updating the profiles (NOAA-TM-AFSC-230). A total of 195 communities have now been profiled. The new profiles add a significant amount of new information to help provide a better understanding of each community's reliance on fishing. The profiles include information collected from communities in the Alaska Community Survey, which was conducted during summer 2011, and the Processor Profiles Survey, which was conducted in fall 2011. The community profiles are available at the following url: http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php and the latest report at the following url: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-230.pdf.

The coastal zone is monitored as part of the coastal management process using physical, chemical, biological, economic and social parameters. Involvement include federal and state agencies and programs including the U.S. Forest Service, U.S. Fish and Wildlife Service, NMFS Pacific Marine Environmental Lab (PMEL), the Alaska Department of Environmental Conservation (DEC) Division of Water, ADFG Habitat Division, the AFSC's *"Ecosystem Monitoring and Assessment Program",* The NMFS' Habitat Conservation Division (HCD) and their Essential Fish Habitats (EFH) monitoring and protection program, the U.S. Coast Guard, the NMFS Alaska Regional Office's Restricted Access Management Program (RAM), the Alaska National Interest Lands Conservation Act (ANILCA) federal agencies cooperation directive, and the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinating the review of large scale projects in the state of Alaska.

3. Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.

FAO CCRF 7.3.3/7.2.2

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

No significant changes have occurred since the previous surveillance audit in 2013. The Magnuson Stevens Fishery Conservation and Management Act (Magnuson Stevens Act, MSA) is the primary domestic legislation governing management of the nation's marine fisheries. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the sablefish fisheries in those regions. Both FMPs present long-term management objectives for the Alaska sablefish fishery. In state waters (0-3 nm), five Alaska sablefish fisheries are managed by ADFG and the BOF outside the IFQ program using a Guideline Harvest Level (GHL). The Aleutian Islands District and Western District of the South Alaska Peninsula Area Sablefish Management Plan (5 AAC 28.640) governs the harvest of sablefish in the Area as described in 5 AAC 28.555(b). 5 AAC 28.360 defines the Cook Inlet Sablefish Management Plan. Sablefish harvest, possession, and landing requirements for Prince William Sound Area are governed under 5 AAC 28.272. Southeast Alaska State managed sablefish (Chatham and Clarence strait) regulations are specified under 5 AAC 28.160 in the Groundfish Commercial Fisheries Regulations. These regulations document long term management objectives for these fisheries.

GOA and BSAI FMPs objectives

Both FMPs present long-term management objectives for the Alaska sablefish fishery. These include sections that describe a Summary of Management Measures and Management and Policy Objectives. The MSA, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. Under the direction of the NPFMC, the GOA and BSAI FMPs define nine management and policy objectives that are reviewed annually. They are:

1) Prevent Overfishing;
2) Promote Sustainable Fisheries and Communities;
3) Preserve Food Webs;
4) Manage Incidental Catch and Reduce Bycatch and Waste;
5) Avoid Impacts to Seabirds and Marine Mammals;
6) Reduce and Avoid Impacts to Habitat;
7) Promote Equitable and Efficient Use of Fishery Resources;
8) Increase Alaska Native Consultation and;
9) Improve Data Quality, Monitoring and Enforcement.

The national standards and management objectives defined in GOA and BSAI FMPs provide adequate evidence to demonstrate the existence of long-term objectives clearly stated in management plans.

Fishery Management Plan for the Groundfish of the BSAI; Apr 2014: http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Fishery Management Plan for the Groundfish of the GOA; Jan 2014: http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

The BSAI and GOA FMPs define specific management measures to avoid excess fishing capacity and maintain stocks that are economically viable for the fishing communities and industry to harvest and process. Management objectives to promote economic conditions for responsible fisheries take into account the interests of subsistence, small-scale, and artisanal fisheries, define three management objectives to conserve biodiversity of aquatic habitats and protect endangered species; and describe management measures to assess environmental impacts from human activities.

State waters

In state waters (0-3 nm), five Alaska sablefish fisheries are managed by ADFG and the BOF outside the IFQ program using a Guideline Harvest Level (GHL). The Aleutian Islands District and Western District of the South Alaska Peninsula Area Sablefish Management Plan (5 AAC 28.640) governs the harvest of sablefish in the Area as described in 5 AAC 28.555(b). 5 AAC 28.360 defines the Cook Inlet Sablefish Management Plan. Sablefish harvest, possession, and landing requirements for Prince William Sound Area are governed under 5 AAC 28.272. Southeast Alaska State managed sablefish (Chatham and Clarence strait) regulations are specified under 5 AAC 28.160 in the ADFG Groundfish Commercial Fisheries Regulations. The Alaska Wildlife Troopers enforce fisheries regulations in state waters.

http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/Groundfish-2013-2014.pdf

http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[JUMP:%27Title5Chap28%27]/doc/{@1}?firsthit

http://dps.alaska.gov/AWT/mission.aspx

http://www.adfg.alaska.gov/index.cfm?adfg-fisheriesboard.main

Area 4A Pots. The Council also initiated a regulatory amendment to follow up on its April 2013 recommendation that the IPHC allow the retention of halibut in Area 4A that are harvested incidentally in sablefish pots in the BSAI when IFQs are held to cover the harvests of both species. The Council informed the IPHC that Federal regulations would need to be amended to identify pots

as legal gear for halibut, at a minimum. The Council also reported that it may consider implementation of a discard mortality rate and/or maximum retainable allowance for this fishery. The IPHC supported the concept in principle and directed that IPHC staff assist with the Council's continued development of accompanying Federal regulations provided that the Council analyzes methods to: 1) limit the directed fishing for halibut using pot gear; 2) consider appropriate methods for the timing of pot removal; and 3) the marking of buoys (radar reflectors). The IPHC would schedule action to revise its definition of legal gear, after it reviewed the proposed additional limitations on the use of the gear at a future IPHC annual meeting. Federal regulations from Council action and IPHC annual management measures would need to be implemented simultaneously.
http://www.npfmc.org/wp-content/PDFdocuments/newsletters/news214.pdf

5 AAC 28.089 Guiding Principles for groundfish fishery regulations
With state groundfish management expanding to cover the groundfish resources in the waters of Alaska, the Board of Fisheries (board) receives regulatory proposals for these fisheries. The board considers, to the extent practicable, the following guiding principles when taking actions associated with the adoption, amendment, or repeal of regulations regarding groundfish fisheries:

(1) conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock;
(2) minimization of bycatch of other associated fish and shellfish and prevention of the localized depletion of stocks;
(3) protection of the habitat and other associated fish and shellfish species from non sustainable fishing practices;
(4) maintenance of slower harvest rates by methods and means and time and area restrictions to ensure the adequate reporting and analysis necessary for management of the fishery;
(5) extension of the length of fishing seasons by methods and means and time and area restrictions to provide for the maximum benefit to the state and to regions and local areas of the state;
(6) harvest of the resource in a manner that emphasizes the quality and value of the fishery product;
(7) use of the best available information presented to the board; and
(8) cooperation with the North Pacific Fisheries Management Council (NPFMC) and other federal agencies associated with groundfish fisheries management.

http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm
http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/Groundfish-2013-2014.pdf

B. Science and Stock Assessment Activities

4. There shall be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes.

FAO CCRF 7.1.9/7.4.4/7.4.5/7.4.6/8.4.3/12.4

ECO 29.1-29.3

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating Determination

The NMFS and ADFG collect fishery data and conduct fishery independent surveys (longline and trawl) to assess the sablefish populations and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. The NMFS/AFSC conducts annual sablefish longline surveys on the continental slope of the eastern Bering Sea, Aleutian Islands, and the GOA. In state waters, fishery independent data come from longline and trawl surveys as well as mark-recapture studies in the NSEI. Fishery dependent data are collected from fixed gear (longline and pot) vessels which target sablefish in the federal IFQ fishery and trawl fisheries that catch sablefish as retained bycatch in other fisheries such as rockfish and sole. Records of catch and effort for these vessels are recorded through the e-landing (electronic fish tickets) catch recording system and also collected by observers and by vessel captains in voluntary and required logbooks. A new Observer Program designed to expand coverage to vessels less than 60 feet long and to provide more flexibility to meet management needs was implemented in 2013 and continued in 2014. These data provide sufficient information for indices used in the stock assessment model.

Table 1. Summary of data sources, types and years available for the sablefish fishery.

Source	Data type	Years
Fixed gear Fisheries	Catch	1960-2013
Trawl fisheries	Catch	1960-2013
Japanese longline fishery	Catch-per-unit-effort (CPUE)	1964-1981
U.S. fixed gear fishery	CPUE, length	1990-2012
	Age	1999-2012
U.S. trawl fishery	Length	1990, 1991, 1999, 2005-2012
Japan-U.S. longline survey	CPUE, length	1979-1994
	Age	1981, 1983, 1985, 1987, 1989, 1991, 1993
Domestic longline survey	CPUE, length	1990-2013
	Age	1996-2012
NMFS GOA trawl survey	Abundance index	1984, 1987, 1990, 1993, 1996, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013
	Length	1984, 1987, 1990, 1993, 1996, 1999, 2003, 2005, 2007, 2009, 2011, 2013

http://www.afsc.noaa.gov/REFM/Docs/2013/goasablefish.pdf

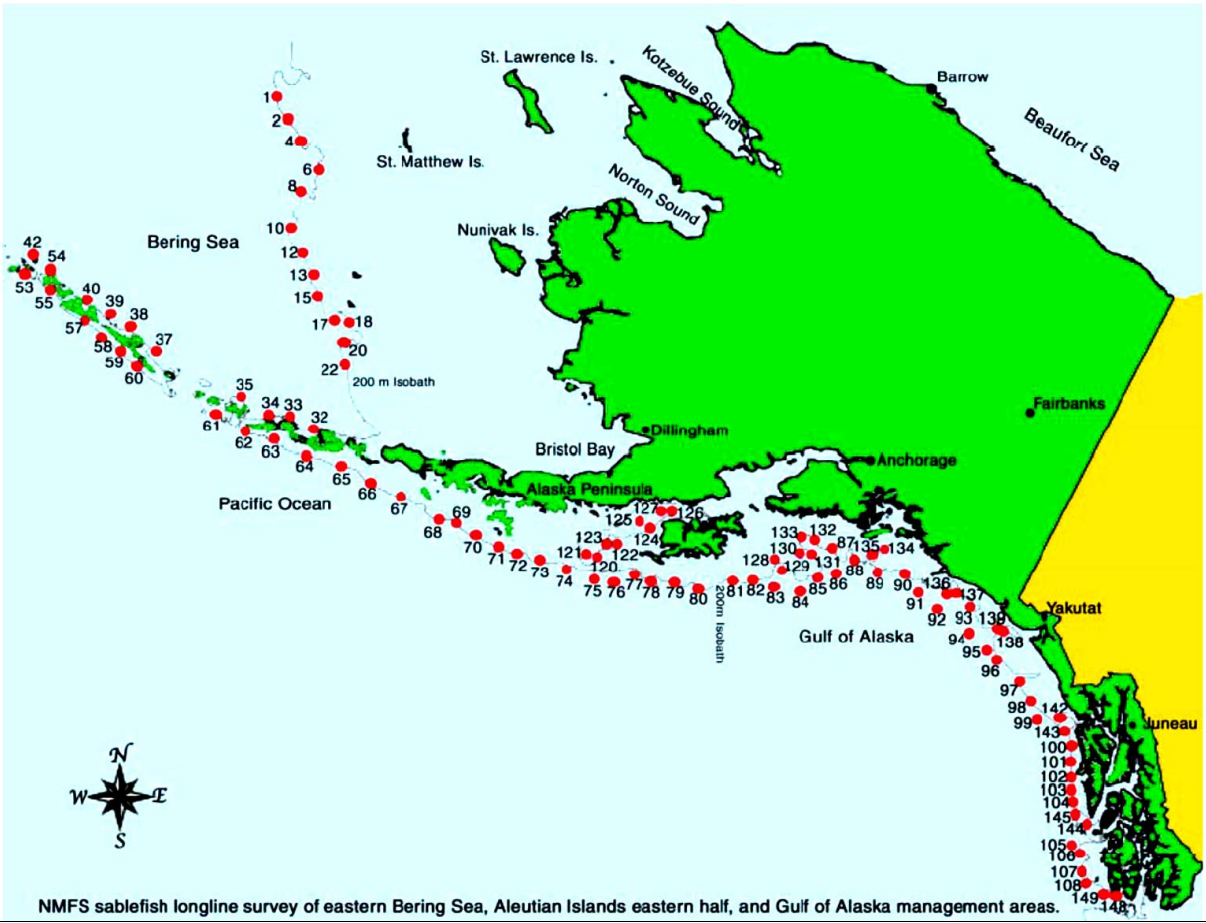
New data used in the 2013 stock assessment model included relative abundance and length data from the 2013 longline survey, relative abundance and length data from the 2012 longline and trawl fisheries, age data from the 2012 longline survey and 2012 fixed gear fishery, abundance and length data from the 2013 Gulf of Alaska trawl survey, updated 2012 catch and projected 2013 catch.

Fishery independent data

A number of fishery independent surveys catch sablefish. The NMFS/AFSC longline survey and GOA bottom trawl survey are used to provide indices for the stock assessment model. By collecting data for catch, effort, age, length, weight, and maturity data, these surveys provide an accurate index of sablefish abundance.

Longline surveys

Since 1978, the U. S. National Marine Fisheries Service (NMFS), Alaska Fisheries Science Center (AFSC) has conducted annual longline surveys with Japan (Japan-U.S. cooperative longline survey, 1978-94) and alone (1987-present, domestic longline survey). The survey has covered the upper continental slope (1978-present) and selected gullies (1987- present) of the Gulf of Alaska and the upper continental slope of the eastern Bering Sea (1982-94, biennially since 1997) and Aleutian Islands region (1980-94, biennially since 1996). The survey lasts three months. The survey is conducted jointly by two components of the AFSC: the Auke Bay Laboratory and the Resource Assessment and Conservation Engineering Division.



NMFS sablefish longline survey of eastern Bering Sea, Aleutian Islands eastern half, and Gulf of Alaska management areas.

Figure 17. NMFS sablefish longline survey of eastern Bearing Sea, Aleutian Islands eastern half, and Gulf of Alaska management areas.

Survey objectives

The survey objectives are to determine 1) relative abundance and size composition of sablefish, shortspine thornyhead (*Sebastolobus alascanus*), Greenland turbot (*Reinhardtius hippoglossoides*) and rougheye and shortraker rockfishes (*Sebastes aleutianus* and *S. borealis*); 2) migration patterns of sablefish, shortspine thornyhead, and Greenland turbot by tag and release methods; and 3) age composition of sablefish through otolith collections.

Survey description

The survey covers the upper continental slope and selected gullies of the eastern Bering Sea, Aleutians Islands region, and Gulf of Alaska. The survey covers nearly all areas where adult sablefish are found. Depths sampled during the survey of the upper continental slope range from about 150-1,000 m. Sampling occurs during the summer and lasts three months. The fixed station positions are divided among six NPFMC management areas: Bering Sea, Aleutian Islands, Western GOA, Central GOA, West Yakutat, and East Yakutat/Southeast.

Stations are placed 30-50 km apart, and gear is set from 150-1000 m at each slope station. Catches are pooled by management area and an abundance index is computed for use in stock assessment and fishery evaluation reports. Scientists have been developing methods to adjust longline samples for whale depredation, but such corrections have not been applied yet in stock assessment models. (see NOAA / AFSC Survey protocol for the Alaska sablefish longline survey at http://www.afsc.noaa.gov/ABL/MESA/pdf/LSprotocols.pdf).

Trawl surveys

NMFS has conducted trawl surveys of the upper continental slope that adult sablefish inhabit biennially or triennially since 1980 in the Aleutian Islands, and since 1984 in the GOA. Trawl surveys of the Eastern Bering Sea slope were conducted biennially from 1979-1991 and standardized for 2002, 2004, 2008, 2010, and 2012. Trawl surveys of the Eastern Bering Sea shelf are conducted annually.

Trawl surveys divide the Gulf of Alaska into 54 strata categorized by depth interval, type of geographical area (e.g., banks, gullies, and slopes) and International North Pacific Fisheries Commission (INPFC) statistical areas. Depth intervals were defined as less than 100, 101-200, 201-300, 301-500, 501-700 and 700 – 1,000 m. After the number of stations was allocated to each stratum, station grid cells are chosen randomly from a 5 x 5 km grid laid over the survey area.

The target tow duration is 15 minutes; minimal acceptable tow duration is 10 minutes. Attempts were made to maintain constant bottom depth, trawl wingspread, and towing speed (3 knots) during each tow.

Tagging studies

Tagging effort in Alaska has been centered in three main areas: 1) adult sablefish in offshore waters of the Gulf of Alaska (GOA), Bering Sea (BS), and Aleutian Islands (AI);2) adult sablefish in the inside waters of Chatham and Clarence Straits; and 3) juvenile sablefish in Southeast Alaska.

NMFS manages the tagging program but cooperates with ADFG in Southeast Alaska Chatham and Clarence Straits.

NMFS/Auke Bay Lab (ABL) has deployed traditional anchor tags on over 360,000 sablefish, recovering more than 33,500. Beginning in 2003, electronic archival tags were deployed inside approximately 1,460 juvenile and adult sablefish and 141 of those have been recovered. Upon release and recapture of the archival tagged fish, geo-position, depth, and biological data may be collected. Beginning in 2011, exploratory work using pop-off satellite tags on sablefish was initiated. These tags are similar to archival tags in that they collect depth and temperature data at pre-determined sampling intervals, but they also record an estimated location. Satellite tags release from the fish at a pre-programmed date and float to the surface where they upload recorded data to passing satellites.

Although not used in federal stock assessment models, tagging studies offer an independent check on the population and migration. A recent analysis of all traditional tag returns indicates a change in the general movement pattern of Sablefish. Based on tag releases until 1990, the pattern of movement was largely counter clockwise with juvenile sablefish moving westward and adults moving eastward.

Analyses of subsequent releases and including releases in the inside waters of Southeast Alaska, indicates a major change in movement for juvenile sablefish which are more likely to move out of the areas where they were tagged, with the exception of the eastern Gulf of Alaska, and the predominant direction of movement is eastward. Larger sablefish appear to be moving more in recent years still in an easterly direction. http://www.afsc.noaa.gov/quarterly/amj2013/AMJ13-Feature.pdf

State waters sablefish fishery independent data

ADFG has a well-developed research capacity. In 1988, the department began annual longline research surveys in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Fixed sampling stations were randomly assigned within statistical areas in both Chatham and Clarence Strait, where the majority of state fleet fishing effort is focused. Once established, the same stations are fished in a similar manner each year to estimate change in relative abundance over time.

A general linear multivariate model has been used to detect significant CPUE trends over time.

Biological data collected during the surveys include length, weight, sex, stage of maturity and otoliths. This data is used to describe the age and size structure of the populations and detect recruitment events. ADFG standardized its survey methods with NMFS survey.

In 2000 the department constructed and purchased survey gear to ensure standardization between survey vessels. Mark-recapture studies for sablefish are also carried out in Southeast Alaska NSEI; but not in SSEI due to likely migration of stocks. ADFG performs annual longline surveys (CPUE, relative abundance, and biological data) in Chatham and Clarence Strait and pot fishery surveys in Clarence Strait. In addition, ADFG is conducting pilot studies to determine the feasibility of an acoustic tagging of sablefish in Chatham Strait.

ADFG conducted a sablefish tagging event in the NSEI Subdistrict using the ADFG vessel, R/V Medeia, from May 21–June 14, 2013. Sablefish were captured using pot gear, tagged, and released. Tagged fish were planned for recovery in the 2013 ADFG longline survey, commercial, subsistence, personal use, and recreational fisheries. The resultant data were used to calculate a biomass estimate and set the 2014 NSEI Subdistrict commercial sablefish AHO.

The 2013 ADFG longline survey took place July 28–August 3, 2013. Data from the 2013 longline survey are used to obtain current size, age, and sexual maturity information for the 2014 stock assessment. No sablefish marking event was conducted in the NSEI Subdistrict in 2014 due to a reduction in legislative general funds and because of a time conflict with scheduled survey vessel maintenance. Due to the continued reduction in funds, sablefish marking will be conducted every other year, beginning in May 2015.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/431292948.pdf

Stock assessment for the other state fisheries is not conducted by ADFG. Instead they use assessment data from NMFS. See clause 5 below for more details.
http://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2012.12.pdf

Fishery dependent data

Fishery data are collected from fixed gear (longline and pot) vessels which target sablefish in the IFQ fishery plus trawl fisheries that catch sablefish as retained bycatch in other fisheries such as those for rockfish and sole. The Restricted Access Management Division of NMFS tracks in season catches and IFQ balances.

Table 2. Alaska sablefish catch (t). The values include landed catch and discard estimates. Discards were estimated for U.S. fisheries before 1993 by multiplying reported catch by 2.9% for fixed gear and 26.9% for trawl gear (1994-1997 averages) because discard estimates were unavailable. Eastern includes West Yakutat and East Yakutat / Southeast. 2013 catch as of October 1, 2013.
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAsablefish.pdf

Year	Grand total	BY AREA								BY GEAR	
		Bering Sea	Aleu-tians	Western	Central	Eastern	West Yakutat	East Yak/SEO	Un-known	Fixed	Trawl
1960	3,054	1,861	0	0	0	1,193			0	3,054	0
1961	16,078	15,627	0	0	0	451			0	16,078	0
1962	26,379	25,989	0	0	0	390			0	26,379	0
1963	16,901	13,706	664	266	1,324	941			0	10,557	6,344
1964	7,273	3,545	1,541	92	955	1,140			0	3,316	3,957
1965	8,733	4,838	1,249	764	1,449	433			0	925	7,808
1966	15,583	9,505	1,341	1,093	2,632	1,012			0	3,760	11,823
1967	19,196	11,698	1,652	523	1,955	3,368			0	3,852	15,344
1968	30,940	14,374	1,673	297	1,658	12,938			0	11,182	19,758
1969	36,831	16,009	1,673	836	4,214	14,099			0	15,439	21,392
1970	37,858	11,737	1,248	1,566	6,703	16,604			0	22,729	15,129
1971	43,468	15,106	2,936	2,047	6,996	16,382			0	22,905	20,563
1972	53,080	12,758	3,531	3,857	11,599	21,320			15	28,538	24,542
1973	36,926	5,957	2,902	3,962	9,629	14,439			37	23,211	13,715
1974	34,545	4,258	2,477	4,207	7,590	16,006			7	25,466	9,079
1975	29,979	2,766	1,747	4,240	6,566	14,659			1	23,333	6,646
1976	31,684	2,923	1,659	4,837	6,479	15,782			4	25,397	6,287
1977	21,404	2,718	1,897	2,968	4,270	9,543			8	18,859	2,545
1978	10,394	1,193	821	1,419	3,090	3,870			1	9,158	1,236
1979	11,814	1,376	782	999	3,189	5,391			76	10,350	1,463
1980	10,444	2,205	275	1,450	3,027	3,461			26	8,396	2,048
1981	12,604	2,605	533	1,595	3,425	4,425			22	10,994	1,610
1982	12,048	3,238	964	1,489	2,885	3,457			15	10,204	1,844
1983	11,715	2,712	684	1,496	2,970	3,818			35	10,155	1,560
1984	14,109	3,336	1,061	1,326	3,463	4,618			305	10,292	3,817
1985	14,465	2,454	1,551	2,152	4,209	4,098			0	13,007	1,457
1986	28,892	4,184	3,285	4,067	9,105	8,175			75	21,576	7,316
1987	35,163	4,904	4,112	4,141	11,505	10,500			2	27,595	7,568
1988	38,406	4,006	3,616	3,789	14,505	12,473			18	29,282	9,124
1989	34,829	1,516	3,704	4,533	13,224	11,852			0	27,509	7,320
1990	32,115	2,606	2,412	2,251	13,786	11,030			30	26,598	5,518
1991	27,073	1,318	2,168	1,821	11,662	10,014			89	23,124	3,950
1992	24,932	586	1,497	2,401	11,135	9,171			142	21,614	3,318
1993	25,433	668	2,080	739	11,971	9,975	4,619	5,356	0	22,912	2,521
1994	23,580	694	1,727	539	9,377	11,243	4,493	6,750	0	20,642	2,938
1995	20,692	930	1,119	1,747	7,673	9,223	3,872	5,352	0	18,079	2,613
1996	17,393	648	764	1,649	6,773	7,558	2,899	4,659	0	15,206	2,187
1997	14,607	552	781	1,374	6,234	5,666	1,930	3,735	0	12,976	1,632
1998	13,874	563	535	1,432	5,922	5,422	1,956	3,467	0	12,387	1,487
1999	13,587	675	683	1,488	5,874	4,867	1,709	3,159	0	11,603	1,985
2000	15,570	742	1,049	1,587	6,173	6,020	2,066	3,953	0	13,551	2,019
2001	14,065	864	1,074	1,588	5,518	5,021	1,737	3,284	0	12,281	1,783
2002	14,748	1,144	1,119	1,865	6,180	4,441	1,550	2,891	0	12,505	2,243
2003	16,491	999	1,120	2,118	7,084	5,170	1,822	3,347	0	14,398	2,093
2004	17,670	1,038	955	2,170	7,457	6,050	2,250	3,800	0	16,014	1,656
2005	16,574	1,064	1,481	1,929	6,701	5,399	1,824	3,575	0	15,018	1,556
2006	15,339	1,037	1,132	2,140	5,870	5,161	1,865	3,296	0	14,097	1,242
2007	15,014	1,173	1,149	2,064	5,613	5,015	1,772	3,243	0	13,778	1,235
2008	14,626	1,135	900	1,670	5,547	5,373	2,055	3,318	0	13,504	1,122
2009	13,091	891	1,096	1,391	4,971	4,743	1,794	2,948	0	12,034	1,057
2010	11,915	754	1,076	1,351	4,477	4,258	1,576	2,682	0	10,912	1,004
2011	12,863	695	1,019	1,398	4,855	4,895	1,886	3,010	0	11,691	1,172
2012	13,582	740	1,199	1,397	5,293	5,225	2,030	3,195	0	12,751	1,101
2013	11,877	600	828	1,235	4,652	4,965	2,008	2,957	0	11,445	835

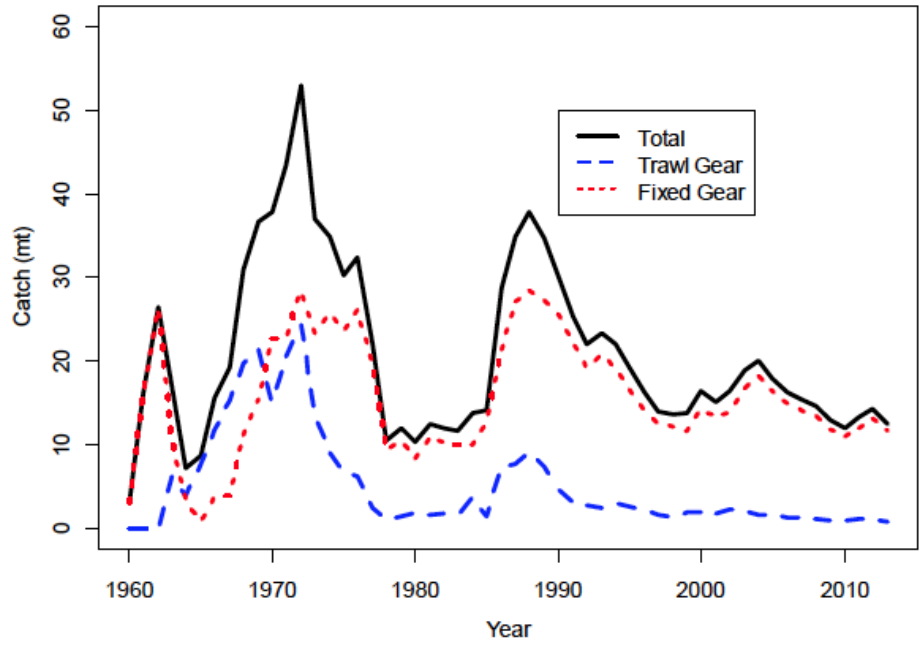


Figure 18. Long term sablefish catch by gear type (thousands of metric tons)
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAsablefish.pdf

Records of catch and effort for these vessels are recorded through the *e*Landing (electronic fish tickets) catch recording system, by observers, and by vessel captains in voluntary and required logbooks.

Table 3. 2013 IFQ sablefish allocations and IFQ landings.

				TAC		
Area	**Species**	**Vessel Landings**	**Total Catch Pounds**	**Allocation Pounds**	**Remaining Pounds**	**Percent Landed**
AI	sablefish	86	1,611,584	2,830,706	1,219,122	57
BS	sablefish	125	798,298	1,393,307	595,009	57
CG	sablefish	687	9,443,940	9,770,787	326,847	97
SE	sablefish	576	6,873,697	7,032,674	158,977	98
WG	sablefish	204	2,847,171	3,086,440	239,269	92
WY	sablefish	221	3,905,307	3,899,937	-5,370	100
	Total	**1,899**	**25,479,997**	**28,013,851**	**2,533,854**	**91**

http://alaskafisheries.noaa.gov/ram/ifq/13ifqland.pdf

***e*Landings**

The "*e*Landing" system is an electronic fish ticket system, for all catch data required to be reported in regulation. *e*Landings supports the internet-based Interagency Electronic Reporting System (IERS) for reporting commercial fishery landings and/or production data for groundfish, IFQ/CDQ halibut and sablefish, and IFQ/CDQ crab and Community of Adak golden king crab. It is a collaborative project with NMFS, ADFG and the International Pacific Halibut Commission (IPHC).

State fishery data

The catches used in the Alaskan sablefish stock assessment includes catches from minor state-managed fisheries in the northern GOA and in the AI region because fish caught in these state waters are reported on the eLandings reporting system using the area code of the adjacent federal waters. The eLandings information feeds directly into the Alaska Regional Office catch reporting system the source of the catch data used in this assessment.
http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

The Southeast Alaska Sablefish harvest (round lb.) (information accessed October 22, 2014)

Year	Fishery	Total Quota	Individual Quota	Estimated Catch	Remaining Catch	Permits	Status
Year	Fishery	Total Quota	Individual Quota	Estimated Catch	Remaining Catch	Permits	Status
2014	NSEI Longline	745,774	9,561	675,207	70,567	78	Open
	SSEI Combined	536,618	23,331	494,760	41,858	23	Open
	SSEI Longline		23,331			20	Closed
	SSEI Pot		23,331			3	Open
2013	NSEI Longline	1,002,162	12,848	971,499	30,663	78	Closed
	SSEI Combined	583,280		505,599	77,681	23	Closed
2012	NSEI Longline	975,000	12,342	969,535	5,465	79	Closed
	SSEI Combined	583,280	25,360	521,825	61,455	23	
2011	NSEI Longline	880,000	10,602	882,779	-2,779	83	
	SSEI Combined	583,280	23,300	540,931	42,349	25	
2010	NSEI Longline	1,063,000	12,218	1,054,275	8,725	87	
	SSEI Combined	634,000	23,400	558,633	75,367	27	
2009	NSEI Longline	1,071,000	12,170	1,071,554		88	
	SSEI Combined	634,000	22,650	595,748		28	
2008	NSEI Longline	1,508,000	15,710	1,513,188		96	
	SSEI Combined	696,000	21,750	618,033		32	
2007	NSEI Longline	1,488,000	14,450	1,501,478		103	
	SSEI Combined	696,000	21,750	620,167		32	

http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareasoutheast.sablefish_fishery_update

Prince William Sound Sablefish harvest (round lb.)

Dol Year	GHL	Harvest
2014	242,000	96,777
2013	242,000	155,448
2012	242,000	203,824
2011	242,000	222,099
2010	242,000	212,229
2009	242,000	219,438
2008	242,000	206,929

http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareapws.pws_groundfish_sablefish_harvest

Cook Inlet Sablefish catch (round lb.)

Year	Vessel Count	GHL	Harvest
2014	5	56,000	50,703
2013	8	66,000	42,287
2012	12	69,000	67,452
2011	10	56,473	57,350
2010	9	53,700	55,899
2009	13	60,000	55,263
2008	12	66,000	68,852

http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareacookinlet.cookinlet_groundfish_sablefish_harvest

Aleutian Islands state waters harvest

The state-waters sablefish season in the Aleutian Islands was set to open to commercial fishing at 12:00 noon on March 8, 2014 in conjunction with the federal IFQ season. The state-waters sablefish season will close when the guideline harvest level (GHL) is reached or on November 7, 2014 if the GHL is not reached. The 2014 Aleutian Islands state-waters sablefish fishery GHL is 347,000 pounds.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/384995846.pdf

International

The International Pacific Halibut Commission (IPHC) conducts a long line survey each year to assess Pacific halibut. This survey differs from the AFSC long line survey in gear configuration and sampling design, but catches substantial numbers of sablefish. Because the majority of effort occurs on the shelf in shallow depths, the IPHC survey may catch smaller and younger sablefish than the AFSC survey; however, measurements of sablefish are not taken on the IPHC survey. During the 2013 IPHC longline survey, 9,265 (extrapolated from subsample) sablefish were taken as bycatch.
http://www.iphc.int/research/37-survey-data.html

Observer Program and data

At-sea and plant observers provide additional fishery data for length and age. On average observers cover 14% of the annual IFQ hook and line catch; in 2011 they covered 10% of the catch (1,319 mt). On average, the percent of the IFQ catch observed is lowest in the East Yakutat/SE (5%), highest in

West Yakutat and Aleutian Islands (~22%), and moderate in the Bering Sea, Central Gulf, and Western Gulf (10-14%). Although the percent of catch observed is not highest in the Central Gulf, the number of sets and vessels observed is greatest in this area and lowest in the BS. In the BS, the average number of sets observed is only 22. Observer coverage in the AI was consistent in all years except 2005 when only 23 sets from six vessels were observed. Since then, the number of observed sets and vessels has increased. Low longline fishery sample sizes in the BS are likely a result of poor observer coverage for sablefish directed trips. Additionally, killer whales impact sablefish catch rates in the BS and AI and these sets are excluded from catch rate analyses.

The restructured NMFS North Pacific Groundfish Observer Program went into effect on January 1, 2013. Program changes restructured the funding and deployment system for observers and expanded observer coverage to vessels less than 60 feet length overall (LOA). To establish the program, NMFS approved amendment 86 to the FMP for Groundfish of the BSAI and Amendment 76 to the FMP for Groundfish of the GOA in 2012.

The Observer Program allows NMFS to determine when and where to deploy observers using funds from fees based on the retained value of harvested groundfish and halibut fisheries. All sectors of the groundfish fishery, including vessels less than 60 feet LOA and the commercial halibut sector, are included in the new Observer Program. Coverage levels and deployment schedules were designed to reduce the potential bias in observer data, increase data collection in fleet sectors previously not covered by observers, to allow managers to respond to management needs in specific fisheries, and to more equitably distribute costs of observer coverage. Sampling by observers may occur at shoreside processors, floating processors, or onboard vessels at-sea. The percentage of the catch observed remained the same between 2012 and 2013 at 23% overall, 13% for catcher vessels and 80% for catcher/processor vessels. The coverage was more representative of actual fishing operations by increasing deployments on vessels and in areas not previously covered. The Program is being fine tuned through yearly Annual Deployment Plans (ADP). First changes have been made in 2014 and then in 2015.
http://alaskafisheries.noaa.gov/sustainablefisheries/observers/ADP_Final_2013.pdf

ADP Motion 2014

C-1 Observer Program motion, North Pacific Fishery Management Council, October 3, 2013. In October 2013 the Council supported the overall provisions for observer coverage described in the 2014 Draft Annual Deployment Plan and the specific Observer Advisory Committee (OAC) recommendations on pages 3-5 of the September OAC report. The Council also recommended continuing the policies that allow vessels to make an annual selection for 100% coverage in the BSAI Pacific cod fishery, not displacing IFQ crew members, and conditional release of vessels to address space and safety concerns. The Council also requested NMFS consider the suggestions provided on page 6 of the OAC report regarding how to prioritize deployment of the 14 cameras available in the NMFS electronic monitoring pilot project in 2014 (see C-1 Observer Program motion, North Pacific Fishery Management Council, October 3, 2013 at http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/ObserverMotion1013.pdf).

ADP Motion 2015

The NPFMC approved item C1, Observer ADP Council Motion – FINAL on the 10/9/14.

The Council approved the Annual Deployment Plan for 2015 with the following recommendations:

- Use trip selection strata to assign vessels in 2015.
- Using two selection strata for 2015: small vessel trip selection and large vessel trip selection.
- Use 12% selection probability for the small vessel trip selection stratum and 24% selection probability for the large vessel stratum.
- Allow conditional releases in 2015 for vessels in the small vessel trip selection stratum that: 1) do not have sufficient life raft capacity to accommodate an observer, and/or 2) to assist in addressing bunk space limited vessels, have been selected for two consecutive trips (e.g., the third consecutive trip is released).
- Vessels selected by NMFS to participate in EM Cooperative Research will be in the no selection pool while participating in such research.
- Trawl vessels that fish for Pacific cod in the BSAI will be given the opportunity to opt-in to full observer coverage and carry an observer at all times while fishing in the BSAI using the same approach as 2014.
- The Annual Report will include information to evaluate a sunset provision, including information on the potential for bias that could be introduced through life raft conditional release, the costs to an individual operator of upgrading to a larger life raft, and the enforcement disincentives from downgrading one's life raft.

http://www.npfmc.org/observer-program/ (Item C1, Observer ADP Council Motion – FINAL on the 10/9/14)

Observer report for 2013

Fees and budget

Federal start-up funding was sufficient to pay for observer coverage until fees were collected and available for use. NMFS successfully implemented the ex-vessel based fee collection program recommended by the Council to fund observer coverage in the partial coverage category.

Cooperation by processors and fishermen in the first year was instrumental to the success of the fee collection program. A total of $4,251,452 in observer fees was collected for 2013. The breakdown in contribution to the observer fee by species is: 38% halibut, 31% sablefish, 19% Pacific cod, 10% pollock, and 2% all other groundfish species.

Deployment Performance Review

The 2013 Observer Report presents a review of the deployment of observers in 2013 relative to the intended sampling plan and goals of restructured observer program. One goal of the observer program restructuring action was to address longstanding concerns about statistical bias of observer

collected data. In evaluating the 2013 sampling plan for the deployment of observers, the review identified situations where bias may exist and recommendations for further evaluation were provided, including improvements to the deployment process that could be considered by NMFS for the 2015 Annual Deployment Plan.

Where the anticipated deployment goals met?

Evaluation of the deployment performance was conducted at the stratum level. Each stratum is defined by the sampling unit (i.e., vessels or trips) and/or rate of sampling. There were two strata under partial coverage: vessel selection and trip selection (the selection unit being vessels or trips, respectively).

Trip Selection

- The realized rates of coverage for 2013 met the anticipated coverage goals for all trip selection strata.
- The Observer Declare and Deploy System performed as expected throughout the year and was unaffected by the government shutdown in October.

Vessel Selection

- Coverage levels in vessel selection were less than expected values during the first five selection periods (January - October). The random selection of vessels for observer coverage was abandoned and all eligible vessels were selected during the last period (November-December). During this selection period coverage levels achieved the anticipated number of vessels specified in the 2013 ADP.
- Vessels were selected for sampling based on whether they fished within a particular selection period in 2012. This meant that any vessels that did not fish in 2012 but did fish in 2013 were not part of the selection pool. This discrepancy between the selection list (sampling frame), and the list of vessels that actually fished (target frame), resulted in some vessels within the vessel selection stratum having no probability of selection. The number of vessels that fished in 2013, but not in 2012, ranged between 9 (January-February) and 49 (July-August) vessels. This problem was evident in all six vessel selection periods. The percent of non-response (vessels that were selected and fished, but were not observed, largely because of conditional releases) ranged between 13% and 71% with peak values between May and July.
- The combination of the conditional releases and a poorly defined list of vessels resulted in NMFS having to select a greater number of vessels in each selection period than desired to reach anticipated selection goals in 2013, decreased the sampling efficiency of the selection.

Dockside Sampling

- Coverage rates for dockside sampling did not meet the objective of deploying observers to complete salmon sampling during all pollock offloads in the Gulf of Alaska. The Observer Program sampled 91% of pollock deliveries. The sampling plan presented several challenges for obtaining a census of deliveries: notifications were not always made, observers were not

always available when and where a pollock delivery was made, salmon held by the processing plant may not have represented a census of all salmon from which the observer obtained his or her systematic sample.

Was the Coverage Representative?

Trip Selection

- No large differences in temporal patterns were apparent in the actual number of observed trips versus the anticipated number of observed trips throughout the year. Although small deviations from the anticipated number of observed trips were evident at the start and end of the year.
- Spatial analysis across federal reporting areas showed the anticipated coverage rates generally were as expected (e.g., consistent spatial patterns of extreme values).
- The OSC evaluated whether observed and unobserved trips had similar characteristics. The empirical distributions showed no large differences in trip length, weight of landed catch per trip, number of NMFS areas fished, or diversity of species caught during a trip. However, small sample sizes during some periods made determining inconsistencies difficult.
- No obvious pattern in trip duration for tender versus non-tender trips was apparent, but the number of observed tender trips was too low to examine on a fine temporal or spatial scale.

Vessel Selection

- The impact of non-response (i.e., a vessel that was selected to be observed but was not) on the spatial distribution of observer coverage on vessel-selected trips was large. In total, 52% of the vessels, and 50% of the trips resulting from these vessels were expected to be observed, but were not due to conditional releases. This high level of non-response, coupled with a low sample size and using vessels as a selection unit likely resulted in systematic spatial coverage issues, with coverage levels being consistently different than expected in Federal reporting area 650 (Southeast Outside District) for much of the year (March and October).
- The small sample sizes per selection period made distinguishing differences in trip attributes between observed and unobserved portions of the fleet difficult. With this caveat in mind, NMFS did not observe large differences in trip duration or landed catch weight. They did observe differences in the number of NMFS areas visited per trip and the diversity of species in landed catch (observed trips had landings with higher diversity).

Sample Size Metrics

- As expected, reporting areas and gear types that had more fishing effort had higher probabilities of having observer data in that gear/area/stratum combination. There were differences in the probability of an observed trip between gear types, with trawl generally having a higher probability of observation due to concentrated fishing in fewer areas (e.g. more trips in any given area) whereas hook-and-line was more disperse (e.g., fewer trips in an area) and more areas/stratum combinations had a higher probability of zero observer coverage.

Observer Availability

- With few exceptions, observers for the partial coverage category were available to deploy on vessels in the trip and vessel selection pools. The restructured program resulted in observer coverage on many vessels less than 60 feet that had not previously been observed, and the contracted observer provider company was able to successfully deploy observers to many remote port locations.

Compliance and Enforcement

- During 2013, AKD agents and officers engaged with industry and the Observer Program in 731 hours of observer related outreach, education, and compliance assistance. Agents and officers in all AKD field offices responded to industry questions and potential observer related violations and participated in industry outreach and Agency meetings.
- Outreach and a collaborative agency response resulted in good industry awareness of the restructured Observer Program and an overall high level of compliance.

Some measure of observer coverage for catch in the sablefish fishery has been provided for the BSAI and GOA fleets in the tables below.

Table 4. Total catch (retained and discard) of groundfish species and halibut (in metric tons) caught in the **Gulf of Alaska** in 2013.

			Hook and Line		Jig		Non-Pelagic Trawl		Pot		Pelagic Trawl	
Sector	Species Caught	Trip Disposition	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard
Catcher/ Processor	Deepwater Flatfish	Observed	16	47			8,837	3,400				
		Total	17	49			8,837	3,400				
	Halibut	Observed		308				547				
		Total		309				547				
	Other groundfish	Observed	38	337			1,031	889				
		Total	39	345			1,031	889				
	Pacific cod	Observed	3,110	98			1,068	760				
		Total	3,128	99			1,068	760				
	Pollock	Observed	4	6			1,156	1,335				
		Total	4	6			1,156	1,335				
	Rockfish	Observed	65	129			11,271	1,522				
		Total	79	129			11,271	1,522				
	Sablefish	Observed	536	11			393	47				
		Total	649	11			393	47				
	Shallow-water flats	Observed		4			1,219	34				
		Total		4			1,219	34				
Catcher Vessel	Deepwater Flatfish	Observed	<1	31			2,698	429		<1	75	1
		Total	1	417			12,946	1,972	<1	1	546	29
	Halibut	Observed	677	746				186		1		19
		Total	10,947	11,613	1			1,262		89		30
	Other groundfish	Observed	50	370			259	210	5	8	34	6
		Total	550	5,825	<1		1,528	1,071	207	244	309	36
	Pacific cod	Observed	960	118			1,992	159	329	1	113	<1
		Total	7,712	1,899	476		17,576	1,524	16,749	109	740	3
	Pollock	Observed	15	3			1,137	164	<1	<1	12,906	60
		Total	90	34	17		8,556	602	12	8	81,471	359
	Rockfish	Observed	78	90			6,898	115		<1	1,913	10
		Total	957	898	27		7,394	209	<1	8	2,129	64
	Sablefish	Observed	1,187	56			344	<1		<1	<1	<1
		Total	9,871	566			404	<1		<1	1	<1
	Shallow-water flats	Observed	<1	2			609	16		<1	<1	<1
		Total	<1	16	<1		3,987	179	<1	2	73	2

Table 5. Total catch (retained and discard) of groundfish species and halibut (in metric tons) caught by catcher/processors in the BSAI in 2013.

Sector	Species Caught	Trip Disposition	Hook and Line		Jig		Non-Pelagic Trawl		Pot		Pelagic Trawl	
			Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard
Catcher/ Processor	Atka Mackerel	Observed	2	23			20,750	658	<1	<1	1	<1
		Total	2	23			20,750	658	<1	<1	1	<1
	Flatfish	Observed	4	1,818			224,539	14,507	<1	295	6,351	2,281
		Total	4	1,854			224,562	14,508	<1	295	6,351	2,281
	Halibut	Observed	36	5,617				3,036		10		217
		Total	36	5,704				3,036		10		217
	Other groundfish	Observed	6	1,149			60	3,894	3	46	89	78
		Total	6	1,159			60	3,895	3	46	89	78
	Pacific cod	Observed	120,207	3,068			38,587	1,216	6,789	26	4,971	4
		Total	122,032	3,090			38,592	1,216	6,789	26	4,972	4
	Pollock	Observed	4,446	608			34,623	3,375	1	4	566,988	36
		Total	4,500	612			34,623	3,375	1	4	567,093	36
	Rockfish	Observed	104	172			31,066	722	<1	<1	265	60
		Total	129	175			31,066	722	<1	<1	265	60
	Sablefish	Observed	318	15			187	2			<1	
		Total	481	15			187	2			<1	
	Turbot	Observed	728	636			24,010	3,379	<1	1	270	121
		Total	751	652			24,010	3,379	<1	1	270	121
	Skates	Observed	5,687	14,441			1,176	2,925			592	705
		Total	5,730	14,645			1,176	2,927			592	705
	Sharks	Observed	<1	41			<1	5			1	15
		Total	<1	41			<1	5			1	15

Table 6. Total catch (retained and discard) of groundfish species and halibut (in metric tons) caught by catcher vessels in the BSAI in 2013.

Sector	Species Caught	Trip Disposition	Hook and Line		Jig		Non-Pelagic Trawl		Pot		Pelagic Trawl	
			Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard	Retained	Discard
Catcher Vessel	Atka Mackerel	Observed		0			<1	1		<1	60	9
		Total		0			<1	2	<1	3	60	9
	Flatfish	Observed		1			8	262	<1	<1	1,067	8
		Total		15			10	382	<1	6	1,101	8
	Halibut	Observed	233	78				318		1		26
		Total	2,256	513	25			416		17		27
	Other groundfish	Observed		3			2	158	0	10	111	1
		Total	<1	49			2	217	40	376	113	1
	Pacific cod	Observed	13	26			27,953	173	760	4	2,354	1
		Total	1,039	361	15		36,423	240	23,369	73	2,392	1
	Pollock	Observed		0			1,320	805		<1	539,680	221
		Total	<1	0			1,578	1,033	1	1	548,741	224
	Rockfish	Observed	3	15			<1	10		<1	224	48
		Total	38	78			<1	15	<1	6	225	48
	Sablefish	Observed	42	2				0	4	<1	<1	
		Total	569	14				0	438	1	<1	
	Turbot	Observed		20			2	159		<1	206	<1
		Total	<1	96			2	209	<1	31	211	<1
	Skates	Observed		58			1	145			179	61
		Total	1	297			1	189			185	62
	Sharks	Observed		1			<1	<1			1	19
		Total		19			<1	<1		<1	1	19

Source: http://alaskafisheries.noaa.gov/sustainablefisheries/observers/annualrpt2013.pdf

Electronic monitoring

NMFS and the Council have developed an Electronic Monitoring (EM) Strategic Plan to integrated video monitoring into the Observer Program. Pacific States Marine Fisheries Commission (PSMFC) launched the Electronic Monitoring (EM) program in 2012 in anticipation of the Pacific Fishery Management Council (PFMC) considering EM as a compliance monitoring tool in the newly implemented Pacific Trawl Rationalization Program. In 2014, PSMFC expanded its EM program to work with the National Marine Fisheries Service - Electronic Monitoring Cooperative Research and Implementation Program which "has been developed to be responsive both to the NPFMC EM Strategic Plan, and to Senate language included in the 2014 NMFS appropriations bill, which directed

NMFS to work with the small boat fixed gear fleet to implement a program designed to test the functionality of available electronic monitoring systems." (NMFS 2014)

Multiple research tracks are being undertaken as part of this cooperative research. At the February 2014 EM workshop in Juneau, a draft EM monitoring approach (EM approach 1) for deploying standard EM cameras was presented by industry members based on information needs outlined in a NOAA memo delivered to the EM workgroup. EM approach 1 identified fishery specific data elements, priority species, operator responsibilities and other operational factors to be tested in order to identify and inform decision points for NPFMC consideration. The 2014 field work that resulted from EM workgroup discussion had two initial objectives. The first was to collect field data to define, evaluate and verify assumptions associated with specific information requirements for technology based monitoring of Alaskan fixed gear fleets. Tasks under this objective include; evaluating the ability of EM reviewers to identify species grouping suggested by the NOAA memo, testing the ability of EM review to determine halibut release methods and injury codes, and evaluating logbook effort data needed to support an EM program. The second objective involved testing operational components of an EM program in order to identify field service needs and develop local support capacity.

Tasks under this objective include; evaluating camera configurations, testing handling procedures such as full retention of rockfish to aid in the identification of cryptic species, identifying field support services needed to ensure data quality, and evaluating the role of dockside monitoring in validating handling procedures and/or improving data quality. Also included in this objective was collecting cost data and identifying decision points related to cost factors.

Track 1 began in spring 2014 with deployment of EM systems on nine vessels in two home ports. The vessels were all longline vessels targeting sablefish (*Anoplopoma fimbria*) and/or Pacific halibut (*Hippoglossus stenolepis*). Forty eight trips were monitored using systems from Archipelago Marine Research Ltd (AMR) and Saltwater, Inc. (Saltwater) before the end of June when host vessels transitioned to other fisheries. The interim funding for the track 1 effort also ended in June. Overall, the 2014 field work helped provide a better understanding of field operation requirements in an Alaskan setting. It also created a controlled setting for deployment of EM technology and enabled industry to gain familiarity with EM systems. Technicians were trained and EM systems were deployed on vessels as a part of the field testing. Therefore, the basic operational elements are in place to carry out technology based monitoring on a limited scale, experiment with different approaches, and develop procedures that inform program design and facilitate future scaling to other ports. PSMFC will be analyzing data sets from trips where the EM data are complete and where dockside monitoring information could be used to assess rockfish species identification. Both service providers were tasked to document their respective efforts and provide a summary of lessons learned. Data from the 2014 field work will continue to be evaluated and used to inform recommendations for the 2015 field season.
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-276.pdf
http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/PSMFC_EMProgram.pdf

Ecosystem data collection

Ecosystem characteristics of BS and AI, and GOA are assessed annually in the Ecosystem Considerations appendix to the BSAI and GOA SAFE Evaluation report. Since 1995, this document has been prepared in order to provide information about effects of fishing from an ecosystem perspective, and the effects of environmental change on fish stocks. Since 1999, the section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures. The Ecosystem Consideration document and report cards were updated for 2013 (see clause 13). An analysis of the relationship between sablefish recruitment and sea temperature plus chlorophyll concentration was updated.
http://www.afsc.noaa.gov/REFM/Docs/2013/ecosystem.pdf

Each SAFE report is required to include an ecosystem section related specifically to the species being assessed. The sablefish ecosystem information was updated for the 2013 SAFE report. (See clause 13 for more information).
http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

Socio-economic data collection

The Economic and Social Sciences Research Program within NMFS's Resource Ecology and Fisheries Management (REFM) Division provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Data is presented in an annual economic status report, most recently in 2013 (Figure 19).

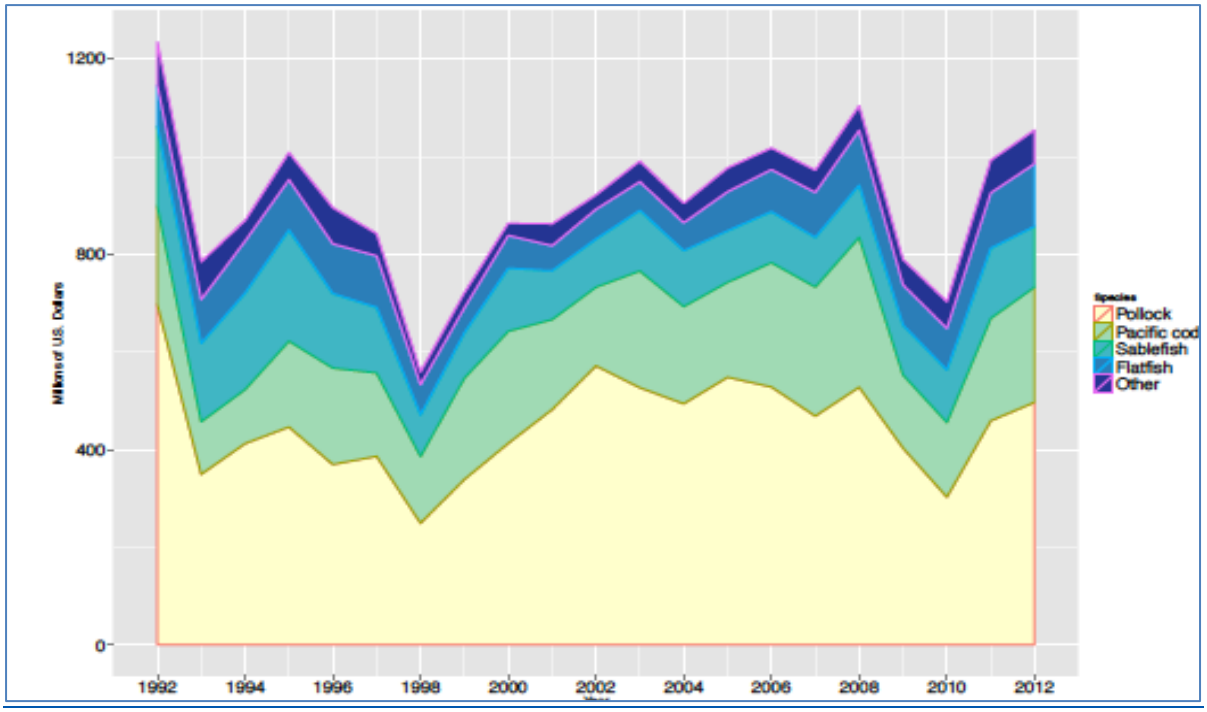


Figure 19. Real ex-vessel value of the groundfish catch in the domestic commercial fisheries of Alaska by species, 1992-2012 (base year 2012)
http://www.afsc.noaa.gov/refm/docs/2013/economic.pdf

In 2005, the AFSC compiled baseline socioeconomic information about Alaskan fishing communities in the first edition of *Community Profiles for North Pacific Fisheries – Alaska* (NOAA-TM-AFSC-160). Between 2010 and 2011, AFSC went through the process of updating the profiles (NOAA-TM-AFSC-230). A total of 195 communities have now been profiled. The new profiles add a significant amount of new information to help provide a better understanding of each community's reliance on fishing. The profiles include information collected from communities in the Alaska Community Survey, which was conducted during summer 2011, and the Processor Profiles Survey, which was conducted in fall 2011. The community profiles are available at the following url: http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php and the latest report at the following url: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-230.pdf.

5. There shall be regular stock assessment activities appropriate for the fishery, its range, the species biology and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization.

FAO CCRF 7.2.1/12.2/12.3/12.5/12.6/12.7/12.17

FAO Eco 29-29.3

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The mission of the NMFS/AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The updated point estimates of B40%, F40%, and F35% from the December 2013 SAFE sablefish assessment are 106,361 t (combined across the EBS, AI, and GOA), 0.094, and 0.112, respectively. Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of B40%), placing sablefish in sub-Tier "b" of Tier 3. Apart from new data, there are no model changes in 2013 relative to 2012. ADFG annual longline research surveys began in 1988 in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Mark-recapture studies for sablefish are also carried out in NSEI. The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The Aleutian Island fishery is set as 5% of the BSAI federal TAC. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Ecosystem considerations for this fishery are reported in the sablefish SAFE report.

Research institutions and scientific capacity

Federal

With passage of the MSA in 1976, US federal jurisdiction occurs out to 200 miles. MSA sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. Guided by these standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the Alaska Fisheries Science Center (AFSC). The mission of the AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The AFSC operates several laboratories (e.g. Auke Bay Biological Lab and the National Marine Mammal Lab), and extensive fisheries monitoring and analysis section (Observers), the Resource Assessment & Conservation Engineering (RACE) and the Resource Ecology Fisheries & Management (REFM) Divisions.

Federal waters stock assessment model

The sablefish population is assessed with an age-structured model. The assessment uses a statistical, forward-projecting age structured model which estimates population numbers and mortality rates separately for male and female sablefish. The model is fitted using data on catches,

length/age compositions and CPUE from the fisheries, and several series of abundance indices and associated age or length compositions from longline and trawl surveys. Much of the biological information for estimates of these factors comes from annual longline surveys, observer samples of the fishery, and fishery logbooks, but tagging results can be used as an independent check on these results. Due to the timing of the government shutdown in October 2013, the SAFE Authors state that there was insufficient time to investigate alternative formulations of the assessment model and consequently the 2012 version of the model was used along with new data for 2013.

Table 7. Summary of data sources, types and years for the sablefish fishery.

Source	Data type	Years
Fixed Gear Fisheries	Catch	1960-2013
Trawl fisheries	Catch	1960-2013
Japanese longline fishery	Catch-per-unit-effort (CPUE)	1964-1981
U.S. fixed gear fishery	CPUE, length	1990-2012
	Age	1999-2012
U.S. trawl fishery	Length	1990, 1991, 1999, 2005-2012
Japan-U.S. longline survey	CPUE, length	1979-1994
	Age	1981, 1983, 1985, 1987, 1989, 1991, 1993
Domestic longline survey	CPUE, length	1990-2013
	Age	1996-2012
NMFS GOA trawl survey	Abundance index	1984, 1987, 1990, 1993, 1996, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013
	Length	1984, 1987, 1990, 1993, 1996, 1999, 2003, 2005, 2007, 2009, 2011, 2013

http://www.afsc.noaa.gov/REFM/Docs/2013/GOAsablefish.pdf

The current model configuration follows a more complex version of the GOA Pacific ocean perch model (Hanselman et al. 2005a) with split sexes to attempt to more realistically represent the underlying population dynamics of sablefish. The current configuration was accepted by the Groundfish Plan Team and NPFMC in 2010. The analysis was completed using AD Model Builder software, a C++ based software for development and fitting of general nonlinear statistical models.

Major changes relative to last assessment:

Input data: New data included in the assessment model were relative abundance and length data from the 2013 longline survey, relative abundance and length data from the 2012 longline and trawl fisheries, age data from the 2012 longline survey and 2012 fixed gear fishery, abundance and length data from the 2013 Gulf of Alaska trawl survey, updated 2012 catch and projected 2013 catch.

There are no model changes since 2012.

Stock assessment results and Stock Status

Quantity/Status	As estimated or specified *last* year for: 2013	2014	As estimated or recommended *this* year for: 2014	2015*
M (natural mortality)	0.10	0.10	0.10	0.10
Tier	3b	3b	3b	3b
Projected total (age 2+) biomass (t)	248,473	255,103	215,446	221,212
Projected female spawning biomass (t)				
Lower 95% confidence interval**	n/a	n/a	83,784	79,224
Point estimate	97,193	94,964	91,212	88,793
Upper 95% confidence interval	n/a	n/a	99,569	95,343
$B_{100\%}$	266,264	266,624	265,903	265,903
$B_{40\%}$	106,506	106,506	106,361	106,361
$B_{35\%}$	93,192	93,192	93,066	93,066
F_{OFL}	0.102	0.100	0.095	0.090
$maxF_{ABC}$	0.086	0.084	0.080	0.077
F_{ABC}	0.086	0.084	0.080	0.077
OFL (t)	19,180	18,000	16,225	14,667
max ABC (t)	16,230	15,220	13,722	12,400
ABC (t)	16,230	15,220	**13,722**	12,400
Status	As determined *last* year for: 2011	2012	As determined *this* year for: 2012	2013
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

* Projections are based on estimated catches of 10,822 t and 9,742 t used in place of maximum permissible ABC for 2014 and 2015. This was done in response to management requests for a more accurate two-year projection.
** Confidence intervals are from MCMC estimated posterior distributions of the projection in Table 3.14.

The fishery abundance index decreased 3% from 2011 to 2012 (the 2013 data were not available). The longline survey abundance index decreased 5% from 2012 to 2013 following a 21% decrease from 2011 to 2012. The GOA trawl survey biomass index decreased 29% from the last trawl survey in 2011. Spawning biomass is projected to decrease from 2014 to 2018, and then stabilize.

Spawning biomass has increased from a low of 30% of unfished biomass in 2002 to 34% of unfished biomass projected for 2014 and is now trending downward. The 1997 year class has been an important contributor to the population but has been reduced and is predicted to comprise less than 8% of the 2014 spawning biomass. The 2000 year class is still the largest contributor, with 18% of the spawning biomass in 2014. The 2008 year class is slightly above average and will comprise 8% of spawning biomass in 2014 even though it is only 40% mature.

The maximum permissible ABC for 2014 from an adjusted *F40%* strategy is 13,722 t. The maximum permissible ABC for 2014 is a 15% decrease from the 2013 ABC of 16,230 t. The 2012 assessment projected a 6% decrease. This larger decrease is supported by the lowest values of the time series for the domestic longline survey index in 2012 and 2013 that offset relatively high survey years in 2010 and 2011. The fishery abundance index was lower in 2012 than 2010 and 2011, and has been

trending down since 2007. The GOA trawl survey biomass index decreased 29% from 2011. The 2012 IPHC sablefish index was not used in the model, but also declined 22% from 2011. In last year's assessment, the estimate of the 2008 year class was increasing based on patterns in the age and length compositions. However the estimate in this year's assessment is only just above average because the estimate is heavily influenced by the large recent overall decrease in the longline survey and trawl indices. Spawning biomass is projected to decline through 2018, and then is expected to increase, assuming average recruitment is achieved. The projection is toward decreasing ABCs with the maximum permissible ABC projected to decrease in 2015 to 12,400 t and 11,876 t in 2016.

Table 8. Model results: specified and recommended reference points for 2013 to 2015. (NOAA / AFSC, SAFE December 2013).

Plan team summaries

Area	Year	Biomass (4+)	OFL	ABC	TAC	Catch
GOA	2012	180,000	15,330	12,960	12,960	11,915
	2013	167,000	14,780	12,510	12,510	10,852
	2014	149,000	12,500	10,572		
	2015	137,000	11,300	9,553		
BS	2012	30,000	2,640	2,230	2,230	740
	2013	19,000	1,870	1,580	1,580	600
	2014	21,000	1,584	1,339		
	2015	19,000	1,432	1,210		
AI	2012	26,000	2,430	2,050	2,050	1,199
	2013	28,000	2,530	2,140	2,140	828
	2014	28,000	2,141	1,811		
	2015	26,000	1,936	1,636		

Year	2013				2014		2015	
Region	OFL	ABC	TAC	Catch*	OFL	ABC	OFL	ABC
BS	1,870	1,580	1,580	600	1,584	1,339	1,432	1,210
AI	2,530	2,140	2,140	828	2,141	1,811	1,936	1,636
GOA	14,780	12,510	12,510	10,852	12,500	10,572	11,300	9,554
W	--	1,750	1,750	1,235	--	1,480	--	1,338
C	--	5,540	5,540	4,652	--	4,681	--	4,230
WYAK	--	2,030	2,030	2,008	--	1,574	--	1,423
SEO	--	3,190	3,190	2,957	--	2,837	--	2,563
Total	19,180	16,230	16,230	12,280	16,225	13,722	14,667	12,400

*Current as of October 1, 2013 Alaska Fisheries Information Network, (www.akfin.org).

Model update and review

The 2011, 2012, and 2013 stock assessment models are identical in all aspects except for inclusion of new data which slightly modify values for some model parameters. A model review group evaluated the 2012 model and concluded that it produces good visual fits to the data and provides biologically reasonable patterns of recruitment, abundance, and selectivities. The 2013 update shows a slight decrease in female spawning and total biomass from previous projections. SAFE authors concluded that the 2013 model is utilizing the new information effectively, and they used it to recommend 2014 ABC and OFL.

To update the 2012 stock assessment, the 2013 model included new data for relative abundance and length data from the 2013 longline survey; relative abundance and length data from the 2012 longline and trawl fisheries; age data from the 2012 longline survey and 2012 fixed gear fishery; abundance and length data from the 2013 Gulf of Alaska trawl survey, and updated 2012 catch and projected 2013 catch.

Table 9. Changes to key parameters and reference points in 2012 (left side, grey) and 2013 (right side, white) stock assessments. (NOAA / AFSC, December 2013 SAFE)

Key parameters		
Number of parameters	213	216
$B_{next\ year}$ *(Female spawning biomass for next year)*	97	91
$B_{40\%}$ *(Female spawning biomass)*	107	106
B_{1960} *(Female spawning biomass)*	176	161
$B_{0\%}$ *(Female spawning biomass)*	266	266
SPR% current	36.5%	34.3%
$F_{40\%}$	0.095	0.094
$F_{40\%\ (adjusted)}$	0.086	0.080
ABC	16.2	13.7
$q_{Domestic\ LL\ survey}$	7.8	7.7
$q_{Japanese\ LL\ survey}$	6.3	6.3
$q_{DomesticLL\ fishery}$	4.1	4.1
$q_{Trawl\ Survey}$	1.4	1.4
$a_{50\%}$ *(domestic LL survey selectivity)*	3.8	3.8
$a_{50\%}$ (LL fishery selectivity)	4.0	3.9
μ_r *(average recruitment)*	17.8	17.8
σ_r *(recruitment variability)*	1.20	1.20

Future model developments

Due to the timing of the government shutdown in October 2013, the SAFE Authors state that there was insufficient time to adequately respond to comments from the SSC and Plan Team for the 2013 assessment. These comments will be addressed in the 2014 assessment.

Total catch accounting

To better determine amounts of total catch from all fisheries, stock assessment authors provide estimates of "other removals" that include non-commercial harvest and the incidental take in the halibut fishery. These estimates represent additional sources of removals to the existing Catch Accounting System estimates. They include new datasets for non-commercial harvest and incidental catch in the halibut fishery.

Non-commercial harvest

In response to Annual Catch Limit (ACL) requirements, assessments now document all removals including catch that are not associated with a directed fishery. Research catches of sablefish have

been reported in previous stock assessments (Hanselman et al. 2009). Estimates of all removals not associated with a directed fishery including research catches are available and are presented in Appendix 3B of the Dec 2013 SAFE. The sablefish research removals are small relative to the fishery catch, but substantial compared to the research removals for many other species. These research removals support a dedicated longline survey. Additional sources of significant removals are bottom trawl surveys and the International Pacific Halibut Commissions longline survey. Other removals are relatively minor for sablefish but the sport fishery catch has been increasing in recent years. Total removals from activities other than directed fishery have been between 273-359 t in recent years. These catches are not included in the stock assessment model. These removal estimates equate to approximately 2% of the recommended ABC and represent a relatively low risk to the sablefish stock. http://www.afsc.noaa.gov/REFM/Docs/2013/goasablefish.pdf

Halibut Fishery Incidental Catch Estimation (HFICE)

The HFICE represents another dataset that provides an estimate of the incidental catch of groundfish in the halibut IFQ fishery in Alaska. To estimate removal amounts in the halibut fishery, methods were developed by the HFICE working group and approved by the Gulf of Alaska and Bering Sea/Aleutian Islands Plan Teams and the Scientific and Statistical Committee of the North Pacific Fishery Management Council.

These estimates are for total catch of groundfish species in the halibut IFQ fishery and do not distinguish between "retained" or "discarded" catch. These estimates should be considered a separate time series from the current CAS estimates of total catch. Because of potential overlaps HFICE removals should not be added to the CAS produced catch estimates. The overlap will apply when groundfish are retained or discarded during an IFQ halibut trip. IFQ halibut landings that also include landed groundfish are recorded as retained in *e*Landings and a discard amount for all groundfish is estimated for such landings in CAS. Discard amounts for groundfish are not currently estimated for IFQ halibut landings that do not also include landed groundfish. For example, catch information for a trip that includes both landed IFQ halibut and sablefish would contain the total amount of sablefish landed (reported in *e*Landings) and an estimate of discard based on at-sea observer information. Further, because a groundfish species was landed during the trip, catch accounting would also estimate discard for all groundfish species based on available observer information and following methods described in Cahalan et al. (2010). The HFICE method estimates all groundfish caught during a halibut IFQ trip and thus is an estimate of groundfish caught whether landed or discarded. This prevents simply adding the CAS total with the HFICE estimate because it would be analogous to counting both retained and discarded groundfish species twice. Further, there are situations where the HFICE estimate includes groundfish caught in State waters and this would need to be considered with respect to ACLs (e.g. Chatham Strait sablefish fisheries). Therefore, the HFICE estimates should be considered preliminary estimates for what is caught in the IFQ halibut fishery. Improved estimates of groundfish catch in the halibut fishery are available following restructuring of the Observer Program. The HFICE estimates of sablefish catch by the halibut fishery are substantial and represent approximately 10% of the annual sablefish ABC. See Table 10. Sablefish and halibut are often caught and landed in association with each other by the IFQ fishery. It is unknown what level of sablefish catch reported here is already accounted for as IFQ harvest in the CAS system because the HFICE estimates do not separate retained and discarded

catch. If these were strictly additive removals, 10% would represent a significant amount of additional mortality and a potential risk to the stock, but how much is additive is unknown. The HFICE estimates may represent some valuable discard information for sablefish, but that level is unknown until these estimates are separated from the IFQ landings and CAS system.

Table 10. Estimates of Alaska sablefish catch (t) from the Halibut Fishery Incidental Catch Estimation (HFICE) working group. AI = Aleutian Islands, WGOA = Western Gulf of Alaska, CGOA = Central Gulf of Alaska, EGOA = Eastern Gulf of Alaska, PWS = Prince William Sound.

Area	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Western/Central AI	27	19	34	18	14	11	36	44	17	23
Eastern AI	18	16	46	26	20	6	4	13	6	7
WGOA	10	9	12	22	21	16	7	12	3	12
CGOA-Shumagin	184	27	36	65	60	47	21	38	10	37
CGOA-Kodiak/ PWS*	802	107	96	89	82	49	57	33	69	63
EGOA-Yakutat	110	324	291	258	240	149	175	103	207	195
EGOA-Southeast	339	335	389	315	269	242	230	184	242	262
Southeast Inside*	459	1,018	1,181	917	786	739	701	574	731	805
Total	1,948	2,231	2,346	2,469	2,194	2,476	1,937	1,874	1,921	1,594

*These areas include removals from the state of Alaska.

(NOAA / AFSC, December 2012 SAFE)

Retrospective analysis

For the 2013 stock assessment, scientists presented retrospective trends in spawning biomass and total biomass for ten previous assessment years (2003-2012) and compared estimates from the current preferred model. Each year of the assessment generally adds one year of longline fishery lengths, trawl fishery lengths, longline survey lengths, longline and fishery ages (from one year prior), fishery abundance index, and longline survey index. Every other year, a trawl survey estimate and corresponding length composition are added. In the first five years of the retrospective plot the SAFE authors see that estimates of spawning biomass were consistently lower for the last few years in the next assessment year (Figure 4). In recent years, the retrospective plot of spawning biomass shows only small changes from year to year. This retrospective pattern is unlikely to be considered severe, but at issue is the “one-way” pattern in the early part of the time series. The model appears to have an inertia that is difficult to overcome. It is difficult to isolate the cause of this pattern but several possibilities exist. For example, hypotheses could include environmental changes in catchability, time-varying natural mortality, or changes in selectivity of the fishery or survey. One other issue is that fishery abundance and lengths, and all age compositions are added into the assessment with a one year lag to the current assessment.

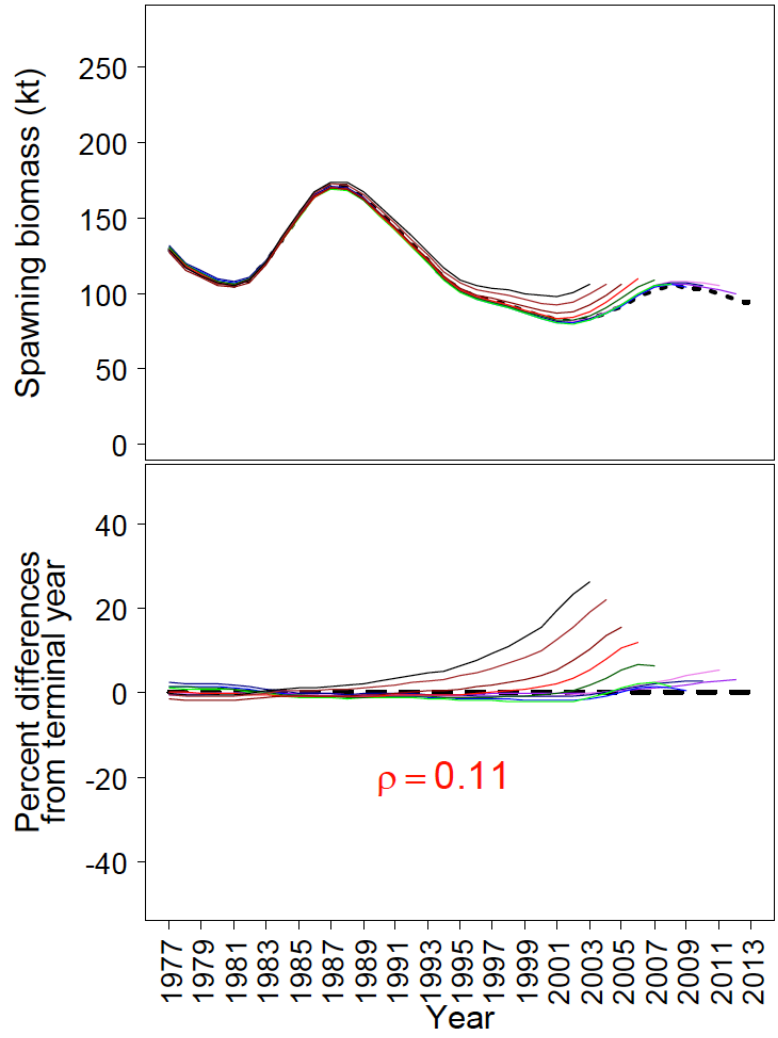


Figure 4. Retrospective trends for spawning biomass (top) and percent difference from terminal year (bottom) from 2002-2013.

Whale depredation

Killer whale depredation of the sablefish longline survey has been a problem in the Bering Sea since the beginning of the survey. This caused scientists to limit the survey results to stations where there was no evidence of depredation in order to avoid potential biases. Sperm whale depredation affects longline catches in the GOA, but evidence of depredation is not accompanied by obvious decreases in sablefish catch. Continued analysis examining both killer whale and sperm whale depredation and their effects on survey abundance indices is warranted and the SAFE authors hope to explore modeling approaches that will take advantage of the full data set to interpolate abundance indices for depredated stations. http://www.afsc.noaa.gov/REFM/Docs/2013/goasablefish.pdf

Ecosystem influences.

A new publication by Shotwell et al. (2012) investigates the utility of incorporating environmental indices within the sablefish assessment model through multistage hypothesis testing, retrospective predictive modeling, and impact analysis. The best models suggest that advection along large-scale oceanographic features such as the North Pacific Polar Front may aid in understanding the spawner-

recruit relationship for sablefish. Additionally, scientists provided a conceptual model termed the Ocean Domain Dynamic Synergy (ODDS) that combines three mechanisms influencing sablefish recruitment. This ODDS model may be used for future research on sablefish recruitment and hypothesis testing of potential explanatory variables to be considered for use in the assessment model.

Spatially-explicit models and tagging studies

Since sablefish have a long-term time series of tag-recovery data, they may be a candidate for developing spatially-explicit stock assessment models; especially in Southeast Alaska, where sablefish data provide good estimates of real abundance and movement between areas. In order to estimate movement and examine appropriate scales of spatial management, the AFSC Auke Bay Laboratories (ABL) has been tagging sablefish since 1972 using a variety of methods including traditional anchor tags, electronic archival tags, and most recently pop-off satellite tags. In state waters, Alaska managers have conducted tagging studies in the NSEI district (Chatham Strait).

Spatially-explicit models can be useful to apportion ABCs and quotas among areas. Although scientists assess Alaska sablefish as one population, federal and state managers allocate harvest to discrete geographic regions (management areas) to distribute exploitation over the whole geographic range. For example, ABC is calculated for the entire Gulf of Alaska, Bering Sea and Aleutian Islands (GOA, BS, and AI), and then this ABC is apportioned among six management areas. These annual quotas for each area are based on the distribution of biomass among the areas, estimated from annual longline surveys and commercial catches.

Overall, the NOAA-TM-AFSC-254 sablefish tagging report to industry (2012) points to the fact that fish of all size groups are more likely to move than stay. This behavior change was most evident in fish that are farther west: annual movement rates for fish in the BS and AI were estimated to be almost 80% higher than previously estimated. Heifetz and Fujioka (1991) did not calculate movement rates for fish in Chatham and Clarence Straits, but Hanselman et al. (in review) showed that fish in Chatham Strait have a high probability of remaining in the same area, whereas fish in Clarence Strait have a high probability of leaving. The directionality of movement in comparison to earlier studies has changed as well. New results show that it is more likely for a fish from all size groups to move east than west. Regarding movement with relation to the size of fish, Hanselman et al. (in review) showed that small fish are more likely to move out of their current area and eastward, in all areas except the EGOA, while medium and large fish move more than previously thought in all areas except the BS. Large fish did show a large increase in annual probability of movement out of the EGOA and WGOA.

Sablefish moved large distances throughout the 39 years of tagging. Mean great-circle distance moved in one year over all size groups was 148 km [80 nautical miles (nmi), and 626 km (338 nmi)] over all time at liberty. These distances are calculated as point-to-point, so they surely are minimum distances. Female sablefish moved slightly farther on average than male fish. The longest a recaptured tagged fish has been at liberty is slightly over 37 years from a fish tagged in 1973 and recovered in 2010. Over half of all recovered tagged fish were recovered within 10 years of being

tagged: 33% of tagged fish were recovered within 2 years of their release, 28% were recovered 3-5 years following their releases, and 24% were recovered 6-10 years following their release. Because of the high movement rates determined by the tag data, it has been shown that apportionments can be flexible to achieve other objectives, while still maintaining spawning biomass.
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-254.pdf

State fisheries stock assessment

For state-managed fisheries, ADFG has a well-developed research capacity. The state's Policy and Planning Committee establish research priorities. In state waters, ADFG manages five sablefish fisheries outside the IFQ program. Three major state fisheries exist which are limited entry and are located in Prince William Sound (PWS), Northern Southeast Inside (NSEI) (or Chatham Strait) and Southern Southeast Inside (SSEI) (or Clarence Strait). The Cook inlet and Aleutian Islands fishery are smaller fisheries than the other three. The Cook Inlet, Prince William Sound and the Aleutian Islands state fisheries are managed using NMFS assessment data, historical catches and effort, projected catch and effort, and a yield-per-unit-area model, among other parameters.

Southeast Alaska

In 1988, the department began annual longline research surveys in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Fixed sampling stations were randomly assigned within statistical areas in both Chatham and Clarence Strait, where the majority of state fleet fishing effort is focused. Once established, the same stations are fished in a similar manner each year to estimate change in relative abundance over time. A general linear multivariate model has been used to detect significant CPUE trends over time. Biological data collected during the surveys include length, weight, sex, stage of maturity and otoliths. These data are used to describe the age and size structure of the populations and detect recruitment events. ADFG standardized its survey methods with NMFS survey. In 2000 the department constructed and purchased survey gear to ensure standardization between survey vessels. Mark-recapture studies for sablefish are also carried out in Southeast Alaska.

State scientists estimate acceptable biological catch (ABC) and annual harvest objective (AHO) for NSEI (Chatham Strait) and SSEI (Clarence Strait) managements units in Southeast Alaska. In the NSEI AHO is calculated by applying a harvest rate to a forecasted biomass based on current year abundance measures with a mark-recapture study. An *F*50% biological reference point (BRP) was used for calculating the 2014 ABC, resulting in a harvest rate of 6.9% (the harvest rate in 2013 was 7.8%). The ABC decreased 21% in 2014 to 952,538 pounds from 1,207,282 pounds in 2012. Factors contributing to this reduction include a decrease in the NSEI mark-recapture abundance estimate, decreases in fishery and survey weight-at-age, and a reduction in the spawning biomass and harvest rate. ADFG longline survey CPUE decreased 23% in round pounds per hook and in fish per hook between 2013 and 2012. NSEI commercial fishery catch per unit effort (CPUE) decreased 8% in 2013 from 2012. The AHO was set at 745,774 round pounds based on the estimated ABC and with decrements for sablefish mortality in other fisheries.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/431292948.pdf

The ADFG evaluates stock status and establishes the SSEI AHO using commercial fishery and survey catch per unit effort (CPUE) data, fishery and survey biological data (age, weight, length, and maturity), and stock status trends of sablefish populations in surrounding geographic areas. The 2014 SSEI AHO was set at 536,618 round lb, a decrease of 8% from the 2013 AHO of 583,280 round lb. This decrease in the 2014 AHO is prompted by a declining trend in the SSEI longline survey CPUE for the past several years, record high harvest of immature sablefish in SSEI (>60% in the commercial fisheries and >75% in the longline survey) in the past two years, and historic lows in the adjacent federal Gulf of Alaska domestic sablefish longline survey index.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/390185246.pdf

Cook Inlet

The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The fishery GHL is adjusted yearly in proportion of the percentage annual change in sablefish total allowable catch (TAC) set by the NPFMC for federal waters of the CGOA. Because sablefish in the Cook Inlet Area are believed to be part of the GOA stock, adjusting the state GHL proportional to changes in the CGOA TAC is a conservative approach for sablefish management. Sablefish GHL for Cook Inlet in 2014 is 56,000 pounds. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/423840827.pdf

Prince William Sound

The Prince William Sound sablefish fishery is managed for a GHL set as the midpoint of a guideline harvest range derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Fishing season length is based on the GHL, estimated number of participants, and past catch rates. For 2014, the 242,000-pound GHL is divided among registered permit holders under the shared quota approach described in regulation 5 AAC 28.272.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/378425150.pdf
http://www.adfg.alaska.gov/FedAidPDFs/FMR13-04.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/RIR.2C.1987.04.pdf

Aleutian Islands

The Aleutian Islands state waters sablefish GHL is calculated at 5% of the combined BSAI total allowable catch. ADFG does not conduct stock assessment but relies on NMFS assessments to set the GHL. Adjustments to the calculated GHL have been made in some years based on prior state waters seasons fishery performance or to compensate for harvest occurring after the previous year's fishery closure. From 1995 to 2011, Aleutian Islands state waters sablefish GHLs have ranged from 250,000 to 660,000 pounds. The guideline harvest level for the 2014 Aleutian Islands state-waters sablefish fishery is 347,000 pounds.
http://www.adfg.alaska.gov/FedAidPDFs/FMR12-38.pdf
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/384995846.pdf

C. The Precautionary Approach

6. The current state of the stock shall be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded.

FAO CCRF 7.5.2/7.5.3

Eco 29.2/29.2bis/30-30.2

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The Tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. The limit reference point is ½ MSY or $B_{17.5\%}$. The probability that next year's spawning biomass will be below B35% was 0.89. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.95 (up from 0.7 last year), and the probability of staying below B40% is near 100%. In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA. The harvest control rule applied to sablefish is recognized as being effective at maintaining the stock at a biomass capable of producing maximum sustainable yield. When stock size falls below a target, the harvest rate is reduced to promote rebuilding to the target. The current biomass of sablefish is estimated to be below the B40% target, and consequently the TAC for the next year will be determined by the rule in Tier 3b, e.g. the harvest rate will be below the maximum allowed.

The Tier System

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The Tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). NPFMC inaugurated the Tier system in fisheries management. In this, the harvest control rule depends on the amount of information available. In Tier 1, information is abundant enough and compelling enough to determine the statistical distribution of maximum sustainable yield. Most of the larger and commercially important stocks are in Tier 3, which has sufficient information to determine $F_{40\%}$ and its corresponding biomass $B_{40\%}$.

Harvest control rule

The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate

based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. In Tiers 1–3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. The control rule is a biomass-based rule, for which fishing mortality is constant when biomass is above the target and declines linearly down to a threshold value when biomass drops below the target.

Sablefish reference points

Reference points are calculated using recruitments from 1979-2011. The updated point estimates of *B40%, F40%,* and *F35%* from the 2012 assessment are 106,361 t, 0.094, and 0.112, respectively (combined across the EBS, AI, and GOA). Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of *B40%*), placing sablefish in sub-Tier "b" of Tier 3. The OFL fishing mortality rate is 0.095 which translates into a 2014 OFL (combined areas) of 16,225 t.

Stock assessors estimated the posterior probability that projected abundance will fall, or stay below thresholds of 17.5% (MSST), and 35% (MSY), and 40% (B_{target}) of the unfished spawning biomass based on the posterior probability estimates. Abundance was projected for 14 years. For management, it is important to know the risk of falling under these thresholds. The probability that spawning biomass falls below key biological reference points was estimated based on the posterior probability distribution for spawning biomass. The probability that next year's spawning biomass was below *B35%* was 0.89. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.95 (up from 0.7 last year), and the probability of staying below B40% is near 100% (Figure 5).

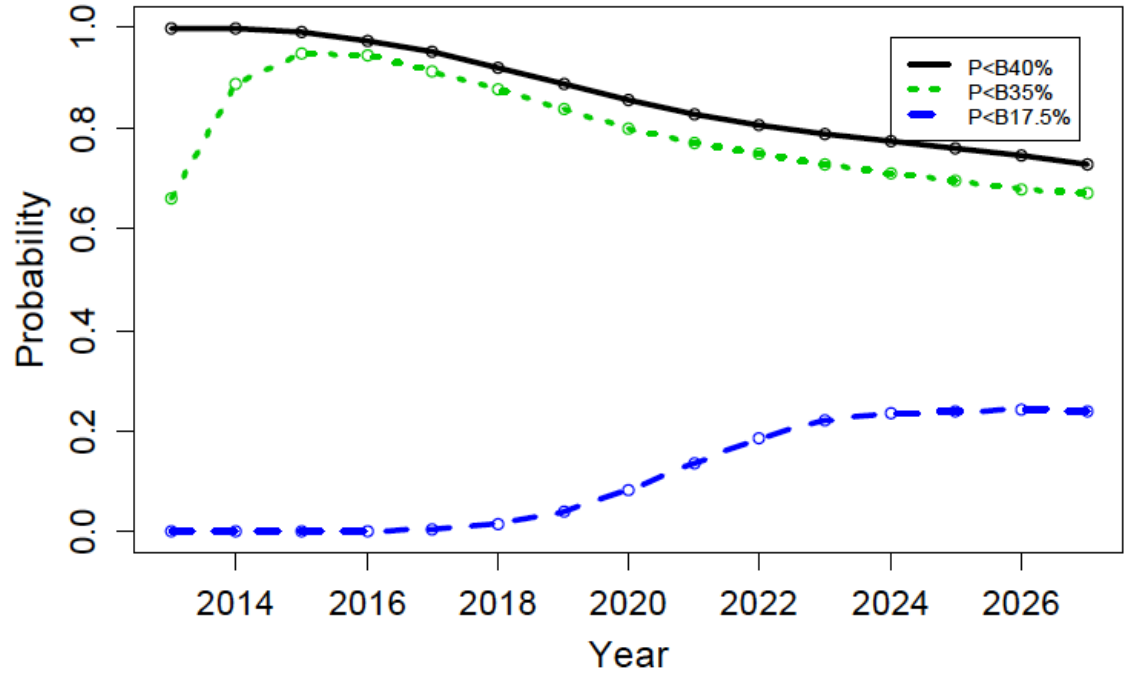


Figure 5. Probability that projected spawning biomass (from MCMC) will fall below B40%, B35% and B17.5%.

Table 11. Sablefish spawning biomass (kilotons), fishing mortality, and yield (kilotons) for seven harvest scenarios. Abundance projected using 1979-2011 recruitments. Sablefish are not classified as overfished. Projected 2014 spawning biomass is 34% of unfished spawning biomass.

Year	Maximum permissible F	Author's F* (specified catch)	Half max. F	5-year average F	No fishing	Overfished?	Approaching overfished?
			Spawning biomass (kt)				
2012	93.3	93.3	93.3	93.3	93.3	93.3	93.3
2013	91.2	91.2	91.2	91.2	91.2	91.2	91.2
2014	87.3	88.8	90.5	88.4	94.3	86.1	87.3
2015	82.9	85.6	88.1	84.6	96.1	80.7	82.9
2016	79.6	81.9	84.9	81.5	98.1	76.8	78.6
2017	79.1	80.9	82.3	80.9	102.3	75.8	77.2
2018	81.3	82.8	81.1	83.3	109.6	77.6	78.7
2019	85.3	86.5	82.9	87.5	119.2	81.0	81.9
2020	89.8	90.8	86.9	92.5	129.9	84.9	85.6
2021	94.2	94.9	90.0	97.6	140.8	88.6	89.2
2022	98.0	98.6	95.8	102.2	151.5	91.9	92.3
2023	101.3	101.8	100.8	106.4	161.5	94.6	94.9
2024	104.1	104.5	105.9	110.1	171.0	96.8	97.1
2025	106.6	106.9	110.2	113.6	179.9	98.8	99.0
			Fishing mortality				
2012	0.067	0.067	0.067	0.067	0.067	0.067	0.067
2013	0.080	0.063	0.040	0.068	-	0.095	0.095
2014	0.077	0.061	0.040	0.068	-	0.090	0.090
2015	0.072	0.075	0.039	0.068	-	0.084	0.084
2016	0.069	0.071	0.037	0.068	-	0.079	0.079
2017	0.067	0.069	0.036	0.068	-	0.077	0.077
2018	0.067	0.068	0.035	0.068	-	0.077	0.077
2019	0.068	0.069	0.036	0.068	-	0.077	0.077
2020	0.069	0.069	0.038	0.068	-	0.078	0.078
2021	0.070	0.070	0.040	0.068	-	0.080	0.080
2022	0.071	0.072	0.042	0.068	-	0.081	0.081
2023	0.072	0.073	0.045	0.068	-	0.083	0.083
2024	0.074	0.074	0.047	0.068	-	0.084	0.084
2025	0.075	0.075	0.047	0.068	-	0.086	0.086
			Yield (kt)				
2012	12.4	12.4	12.4	12.4	12.4	12.4	12.4
2013	13.7	13.7	7.0	11.7	-	16.2	13.7
2014	12.0	12.4	6.6	10.8	-	13.8	12.0
2015	11.2	11.9	6.5	10.6	-	12.6	13.2
2016	11.7	12.2	7.0	11.3	-	13.0	13.5
2017	12.6	13.1	7.7	12.1	-	14.0	14.4
2018	13.7	14.0	8.5	12.9	-	15.1	15.4
2019	14.8	15.0	9.2	13.7	-	16.3	16.6
2020	15.8	15.9	9.9	14.3	-	17.4	17.5
2021	16.6	16.8	10.5	14.9	-	18.3	18.4
2022	17.3	17.4	11.0	15.4	-	18.9	19.0
2023	17.9	18.0	11.5	15.8	-	19.5	19.6
2024	18.6	18.6	12.0	16.3	-	20.2	20.2
2025	19.3	19.3	12.6	16.7	-	21.0	21.0

* Projections in Author's F (Alternative 2) are based on estimated catches of 10,822 t and 9,742 t used in place of maximum permissible ABC for 2014 and 2015. This was done in response to management requests for a more accurate two-year projection.

http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

Model projections indicate that this stock is neither overfished nor approaching an overfished condition, when considering stocks combined across the EBS, AI, and GOA.

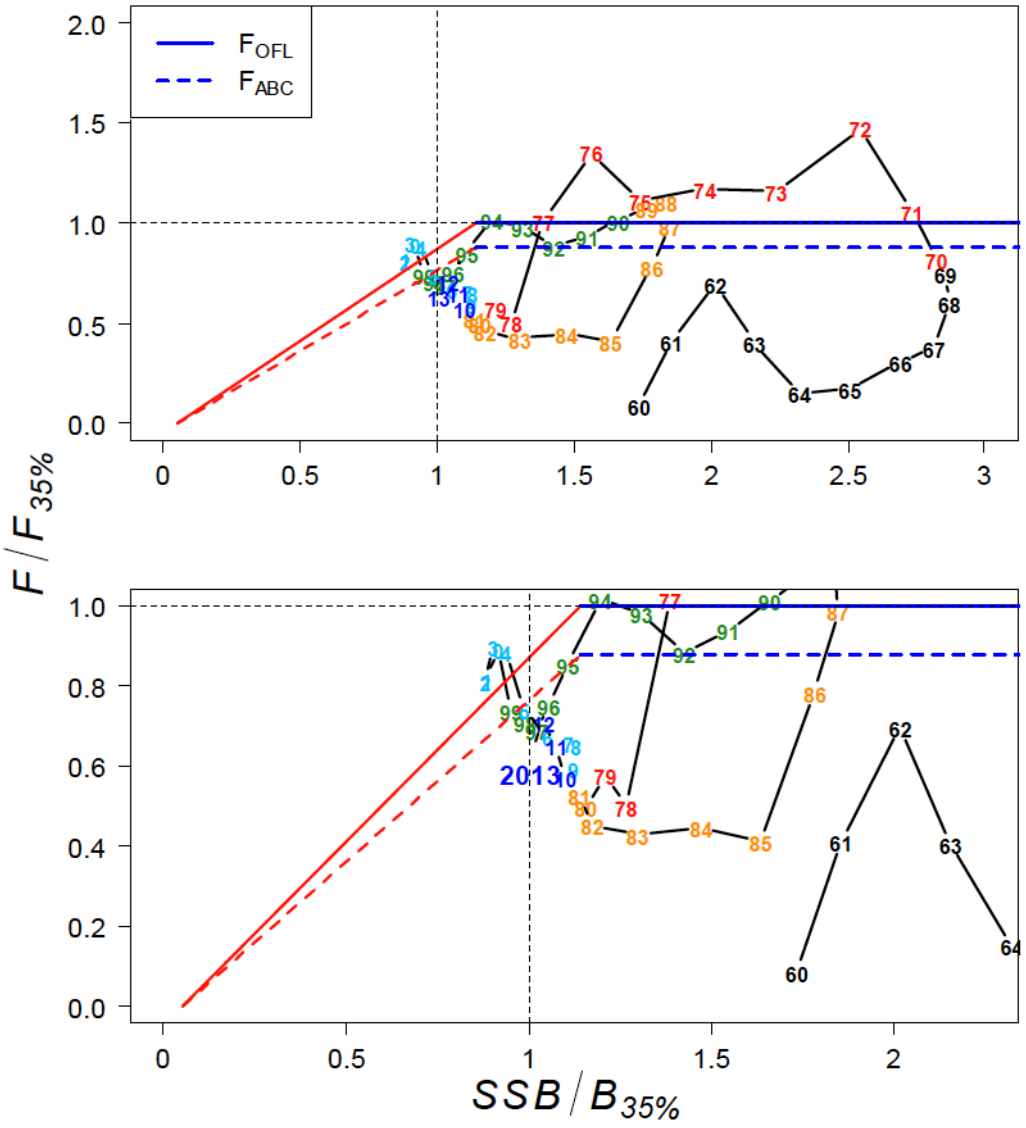


Figure 6. Phase-plane diagram of time series of sablefish estimated spawning biomass relative to the unfished level and fishing mortality relative to F_{OFL} for author recommended model. Bottom figure is zoomed in to examine more recent years.
http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

2014 Acceptable Biological Catch

The 2013 stock assessment recommended a 2013 ABC of 13,772 t. It represents the maximum permissible ABC for 2014 from an *F40%* strategy. The maximum permissible ABC for 2014 is a 15% decrease from the 2013 ABC of 16,230 t. This decrease is supported by the lowest values of the time series for the domestic longline survey index in 2012 and 2013 that offset the relatively high survey years in 2010 and 2011.

Spawning biomass

Spawning biomass has increased from a low of 30% of unfished biomass in 2002 to 34% of unfished biomass projected for 2014 and is now trending downward. The 1997 year class has been an important contributor to the population but has been reduced and is predicted to comprise less than

8% of the 2014 spawning biomass. The 2000 year class is still the largest contributor, with 18% of the spawning biomass in 2014. The 2008 year class is slightly above average and will comprise 8% of spawning biomass in 2014 even though it is only 40% mature. Spawning biomass is projected to decline through 2018, and then is expected to increase, assuming average recruitment is achieved. The projection is toward decreasing ABCs with the maximum permissible ABC projected to decrease in 2015 to 12,400 t and 11,876 t in 2016.

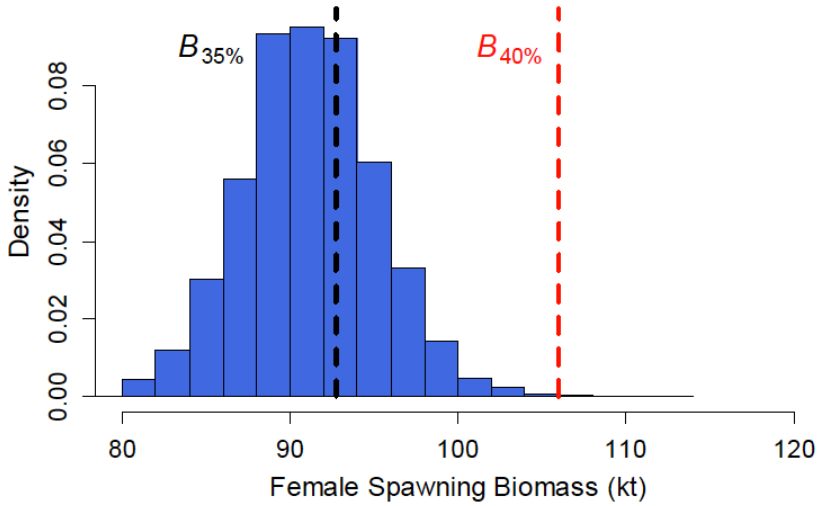


Figure 7. Posterior probability distribution for projected spawning biomass (thousands t) in 2014. http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

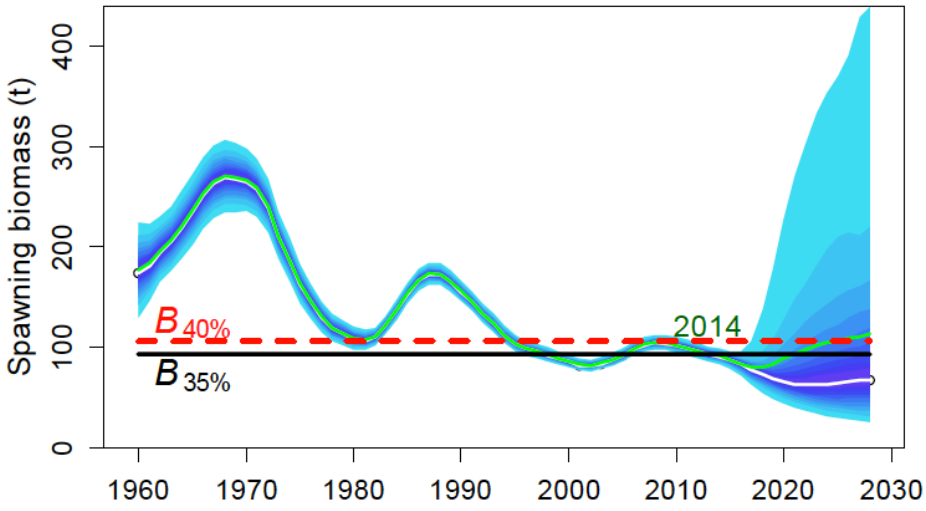


Figure 8. Estimate of female spawning biomass (thousand t) and their uncertainty. White line is the median and green line in the mean, shaded fills are 5% increments of the posterior probability distribution of spawning biomass based on 10 million MCMC simulations. Width of shaded areas is the 95% credibility interval. Harvest policy is the same as the projections in scenario 2 (Author's F). Projected 2014 spawning biomass is 34% (B34) of unfished spawning biomass.
http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

State Fisheries

In state waters, ADFG manages five sablefish fisheries outside the IFQ program. Three major state fisheries exist which are limited entry and are located in Prince William Sound (PWS), Northern Southeast Inside (NSEI) (or Chatham Strait) and Southern Southeast Inside (SSEI) (or Clarence Strait), and two smaller fisheries, the Cook inlet and Aleutian Islands fishery. The Cook Inlet, Prince William Sound and the Aleutian Islands state fisheries have harvest limits and are managed using NMFS assessment data (and therefore federal reference points), historical catches and effort, projected catch and effort, and a yield-per-unit-area model, among other parameters. Details have been provided under the previous fundamental clause (No. 5).

Key reference:

NOAA / AFSC. December 2013. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2013/BSAIsablefish.pdf

7. Management actions and measures for the conservation of stock and the aquatic environment shall be based on the Precautionary Approach. Where information is deficient a suitable method using risk assessment shall be adopted to take into account uncertainty.

FAO CCRF 7.5.1/7.5.4/7.5.5

FAO ECO 29.6/32

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

The first element of the precautionary approach is the Optimum Yield (OY) for the groundfish complexes in the Bering Sea / Aleutian Islands (BSAI) and the GOA as a range of numbers. The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. The second element of precautionary approach is the Tier system, based on knowledge and uncertainties of the stock in question. NPFMC inaugurated the Tier system in fisheries management: the harvest control rule depends on the amount of information available. The less the information about a given stock, the more conservative is the catch allowed. The third element of the precautionary approach is the ACL, OFL, ABC and TAC system. Allowable Biological Catch (ABC) is a scientifically acceptable level of harvest based on the biological characteristics of the stock and its current biomass level. Overfishing Level (OFL) is a limiting catch level, corresponding to fishing at MSY level, higher than ABC, which demarcates the boundary beyond which the fishery is no longer viewed as sustainable. In application, the NPFMC sets TAC ≤ ABC < OFL. Bycatch from a given stock is limited by a Maximum Retainable Bycatch amount (MRB), which is determined as a percentage of retained catch (not including arrowtooth flounder). Alternatively, Prohibited Species Catches (PSC) limits close fisheries when reached.

Optimum Yield

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The first element of the precautionary approach is the Optimum Yield (OY) for the groundfish complexes in the BSAI and the GOA as a range of numbers. The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. The range for BSAI is 1.4 to 2.0 million mt while the range for GOA is 116 to 800 thousand mt. In practice, only the upper OY limit in the BSAI has been a factor in altering harvests. That is, that the sum of the TACs exceeded the upper range so harvest was constrained to not exceed the OY cap. The Council originally adopted the 2.0 million mt cap to meet the needs of the ecosystem. Trawl assessment surveys indicated that in many years the sum of the ABCs would have exceeded the OY cap if the NPFMC had not set aside the ABC in excess of the cap for ecosystem consideration. Thus, total groundfish harvest limits the total groundfish harvest that can be taken from the BSAI and GOA marine ecosystems, effectively adopting a conservative ecosystem approach to fisheries.

Tier System

The second element of precautionary approach is the Tier system, based on knowledge and uncertainties of the stock in question. NPFMC inaugurated the Tier system in fisheries management:

the harvest control rule depends on the amount of information available. The less the information about a given stock, the more conservative is the catch allowed. Currently, sablefish in Alaska is managed under Tier 3, where sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level.

OFL, ABC, ACL and TAC

The third element of the precautionary approach is the ACL, OFL, ABC and TAC system. Allowable Biological Catch (ABC) is a scientifically acceptable level of harvest based on the biological characteristics of the stock and its current biomass level. Overfishing Level (OFL) is a limiting catch level, corresponding to fishing at MSY level, higher than ABC, which demarcates the boundary beyond which the fishery is no longer viewed as sustainable. In application, the NPFMC sets TAC ≤ ABC < OFL. Since 1981, actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC because of the complex array of accountability measures governing these fisheries. See figure below for a figure showing the main catch management measures currently in use by federal management in the BSAI as an example.

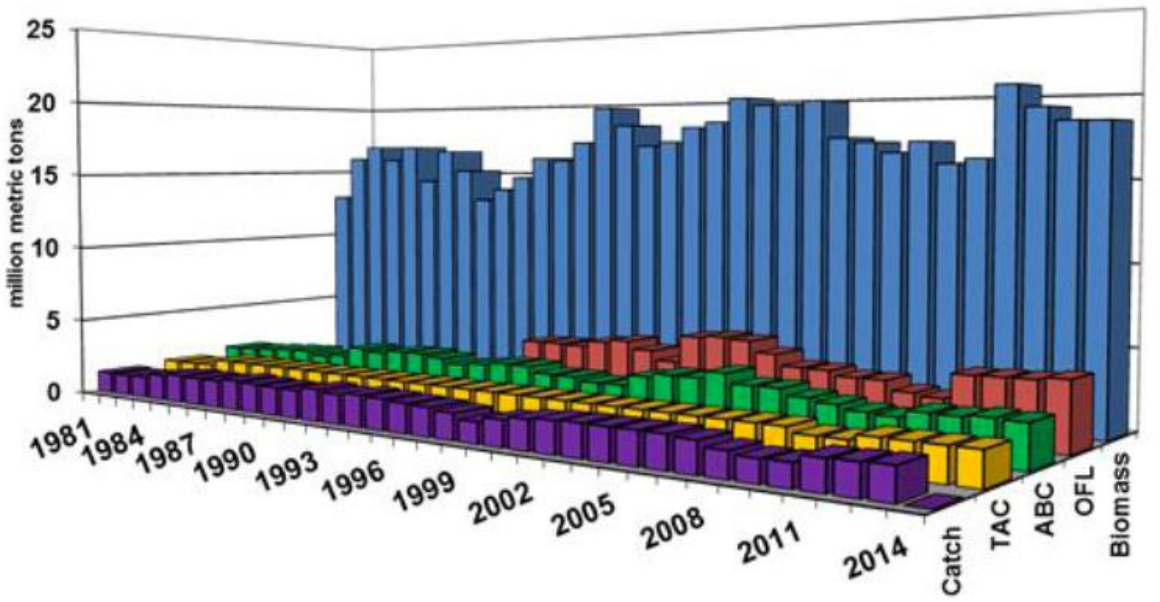


Figure 9. Biomass, Overfishing Level, Acceptable Biological Catch, and Total Allowable Catch for 1981-2014 (as recommended by the Plan Team and assuming total TACs = OY) and Catch, 1981-2013.

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIintro.pdf

http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

The harvest control rule is intended to account for scientific uncertainty in two ways: First, the control rule is structured explicitly in terms of the type of information available, which is related qualitatively to the amount of scientific uncertainty. Second, the size of the buffer between *max FABC* in the Tier of the ABC control rule and *FOFL* in the Tier of the OFL control rule varies directly

with the amount of scientific uncertainty. For the information levels associated with the remaining tiers, relating the buffer between *max FABC* and *FOFL* to the amount of scientific uncertainty is more difficult because the amount of scientific uncertainty is harder to quantify, so buffers of fixed size are used instead.

Bycatch Limits

Bycatch from a given stock is limited by a Maximum Retainable (bycatch) Amount (MRA), which is determined as a percentage of retained catch (not including arrowtooth flounder). In practice, NMFS attempts to manage a fishery so that total catch (including all discards) is less than, but very close to the TAC. Ideally, the directed fisheries are closed well before TAC is reached, so that when bycatch numbers for that stock in other fisheries are factored in, the annual total catch is less than but very close to TAC. When a directed fishery is closed, bycatch of that stock is limited by an MRA amount. If it appears that the TAC may be exceeded due to unanticipated circumstances, and ABC is being approached, NMFS managers will prohibit retention of that species by all fisheries, in order to eliminate any 'top off' activity for bycatch of valuable species. If ABC is exceeded, and OFL is being approached, NMFS can prohibit or close any fisheries that might possibly take that species as bycatch.

The Council determines the TAC based on social and economic considerations. In application, the NPFMC sets TAC ≤ ABC < OFL. Actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC (Figure 9). The four main reasons that TAC may be set lower than ABC are: (1) to remain under the 2 million mt OY limit; (2) to increase a rebuilding rate or address other conservation issues; (3) to limit incidental bycatch, for example of halibut; or (4) to account for state water removals. Fisheries are managed in-season to achieve the TACs without exceeding the ABC or OFL.

State waters

In state waters, five sablefish state fisheries are managed by the ADFG and the BOF outside the IFQ program. Two minor state fisheries are the ones in Cook Inlet and the Aleutian Islands managed using a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey for the area. Three major state fisheries exist which are limited entry and are located in Prince William Sound, Chatham and Clarence Strait. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For the Clarence and Chatham Strait fisheries an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population. In addition, in Chatham Strait an annual stock assessment is performed which includes a mark-recapture estimate of the population abundance.
http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management

D. Management Measures

8. Management shall adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

FAO CCRF 7.1.1/7.1.2/7.1.6/7.4.1/7.6.1/7.6.9/12.3
FAO Eco 29.2/29.4/30

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating Determination

The federal sablefish fishery is managed under an Individual Quota System (IFQ). Under the major State managed sablefish fisheries, the use of an equal quota share system is very much like individual fishery quotas, and produces the same efficiencies. The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify Annual Catch Limits (ACLs) with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)) and to subsequently account for whatever catches, bycatch or discards previously unaccounted. The Federal FMP for the BSAI and GOA list the fishery closures that are in place throughout Alaska. These closures apply to different vessels and gear types. The NMFS and the ADFG have well-established regulations on fishing seasons and legal gear use. Longline, trawl and pot gear are all regulated to increase selectivity of the target species and to avoid bycatch and discards. In addition to this, management measures and operational methods (i.e. MRB, PSC) are in place to account for bycatch and discards of encountered bycatch species.

Derivation and management of catch limits

The AFSC's REFM Division conducts research and data collection to support an ecosystem approach to management of Northeast Pacific and eastern Bering Sea fish and crab resources. More than twenty-five groundfish and crab stock assessments are developed annually and used by the NPFMC to set catch quotas. In addition, economic and ecosystem assessments are provided to the Council on an annual basis. Division scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate variations.

One tool to accomplish this is through a rights-based fishery approach, or the use of individual fishing quotas. IFQ management has increased fishery catch rates and decreased the harvest of immature fish. Catching efficiency (the average catch rate per hook for sablefish) increased 1.8 times with the change from an open-access to an IFQ fishery. The improved catching efficiency of the IFQ fishery reduced the variable costs incurred in attaining the quota. Under the major State managed sablefish fisheries, the use of an equal quota share system is very much like individual fishery quotas,

and produces the same efficiencies. Decreased harvest of immature fish improved the chance that individual fish will reproduce at least once. Spawning potential of sablefish, expressed as spawning biomass per recruit, increased nine percent for the IFQ fishery. The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify Annual Catch Limits (ACLs) with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)) and to subsequently account for whatever catches, bycatch or discards previously unaccounted. Please also refer to the references, Tier and harvest control system as explained in Clause 7.
http://alaskafisheries.noaa.gov/ram/ifq.htm

Because the main sablefish harvest is conducted under an IFQ management system, once the target harvest (TAC) is determined by the Council process, NMFS/RAM sets the individual fishing quotas to not exceed the available harvest. This process is additionally conservative for two reasons. First, IFQ is often harvested over a number of fishing trips. If the quota available on the final trip is small, it may not be economically profitable to return to the fishing grounds to harvest it and it is left on the table. Second, the sum of the IFQs by area may not be achieved due to the regulatory repercussions of IFQ overages being sufficient to cause most IFQ holders to slightly fish under their annual IFQ.
http://www.fao.org/docrep/005/y2684e/y2684e22.htm

The MSA's National Standard 9 governs federal regulators. It states that conservation and management measures shall, to the extent practicable, A) minimize bycatch and B) to the extent bycatch cannot be avoided; minimize the mortality of such bycatch. Regulations in place address waste, discard, bycatch, and endangered species interactions in the sablefish fisheries. The NMFS promulgates these regulations through the NPFMC. The Council's objective is to develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems. They also encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available. Prohibited Species Catch (PSC) limits are another measure to control bycatch of economically important and gear susceptible (from other fisheries) species. These include halibut, salmon, king and snow crab and the attainment of the allowed caps in a given fishery, effectively closes the fishery down for the year.
http://alaskafisheries.noaa.gov/ram/ifq.htm

Since 2013, the restructured North Pacific groundfish observer program expanded coverage to vessels <60 ft LOA and implemented a more flexible system. The observer program, now towards its third year of operation, was designed to provide better by-catch data for future stock assessments and to include the halibut fishery, previously fully unobserved. See clause 4 for a more detailed description of the new program.

Closures and seasons

The Federal FMP for the BSAI and GOA list the fishery closures that are in place throughout Alaska. These closures apply to different vessels and gear types. For example, there are closures to all vessels (i.e. fishing or anchoring within the Sitka Pinnacles Marine Reserve is prohibited at all times); use of trawl gear prohibited at all times in the Southeast Outside district, year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area, the Nearshore Bristol Bay Trawl Closure area is also closed year-round except for a subarea that remains open between April 1 and June 15 each year. The Chum Salmon Savings Area is closed to trawling from August 1 through August 31. Closures also apply to non-pelagic trawl (i.e. the use of non-pelagic trawl is prohibited in Cook Inlet). Also, three types of closure areas are designated around Kodiak Island. Type I areas prohibit non-pelagic trawling year-round; Type II prohibit non-pelagic trawl from February 15 to June 15; adjacent areas designated as Type III may be reclassified by the Regional Administrator as Type I or Type II following a recruitment event. The Gulf of Alaska Slope Habitat Conservation Area is closed to non-pelagic trawling year-round. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round and in the Aleutian Islands Coral Habitat Protection Areas year-round. The use of mobile bottom contact gear is prohibited year-round in Bowers Ridge Habitat Conservation Zone.

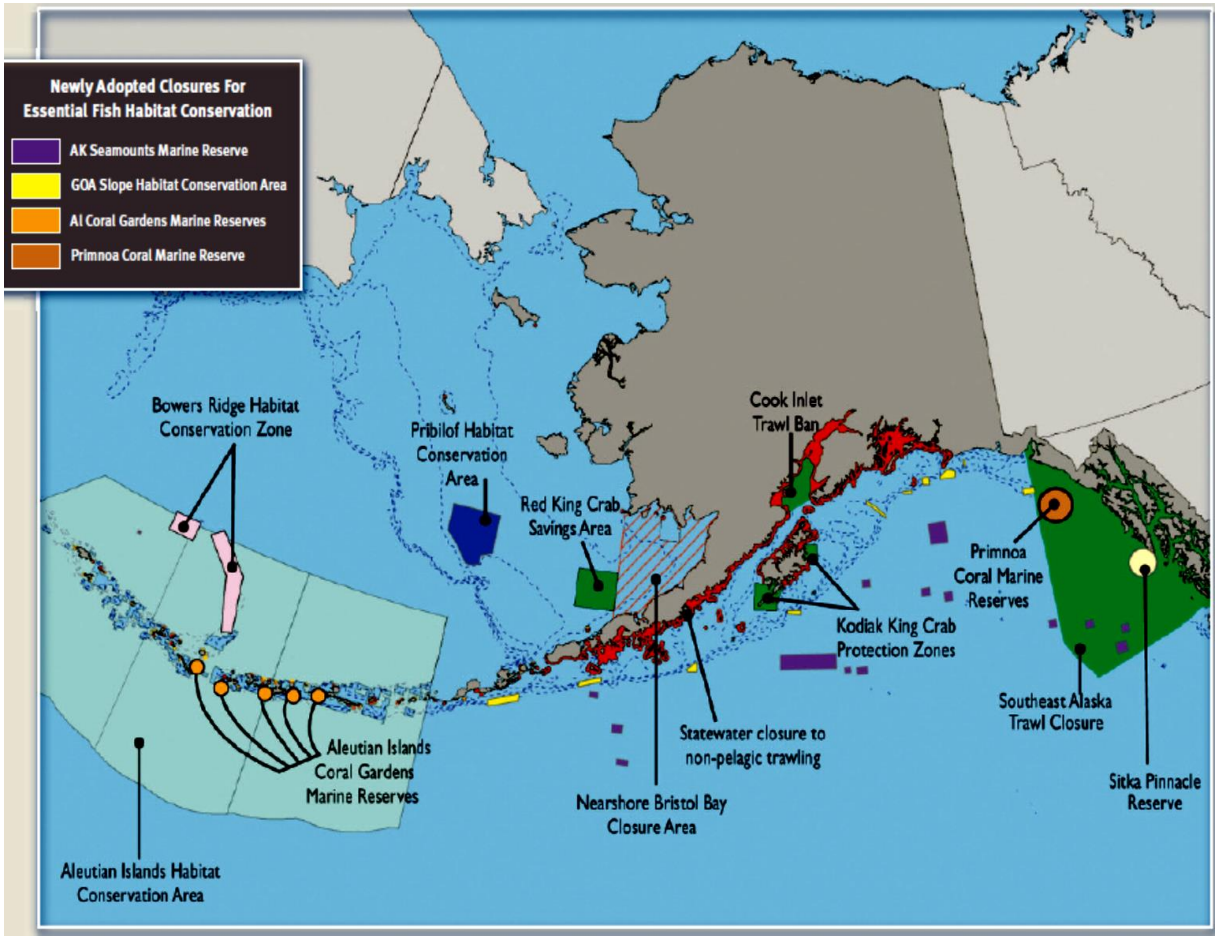


Figure 10. Year round closures in Alaska waters.

https://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf

Area allocation of harvests

In December 1999, the Council apportioned the 2000 ABC and OFL based on a 5-year exponential weighting of the survey and fishery abundance indices. The authors have used the same algorithm to apportion the ABC and OFL since 2000. Following the standard apportionment scheme, they have observed that the objective to reduce variability in apportionment was not being achieved. Since 2007, the average change in apportionment by area has increased annually. While some of these changes may actually reflect interannual changes in regional abundance, they most likely reflect the high movement rates of the population and the high variability of estimates of abundance in the Bering Sea and Aleutian Islands.

For example, the apportionment for the Bering Sea has varied drastically since 2007, attributable to high variability in both survey abundance and fishery CPUE estimates in the Bering Sea. These large annual changes in apportionment result in increased variability of ABCs by area, including areas other than the Bering Sea (XX). Because of the high variability in apportionment seen in recent years, it is not believed that the standard method is meeting the goal of reducing the magnitude of interannual changes in the apportionment.

Because of these reasons, the SAFE authors recommended fixing the apportionment at the proportions from the 2013 assessment until the apportionment scheme is thoroughly reevaluated and reviewed. A Ph.D. student with the University of Alaska-Fairbanks began a project in 2012 with the objectives of re-examining the apportionment strategy and conducting management strategy evaluations. A spatial sablefish model has been developed, but management strategy evaluations have not begun yet. Meanwhile, it seemed imprudent to move to an interim apportionment or return to the former scheme until more satisfactory methods were identified and evaluated. Therefore, for 2015, the SAFE authors recommended keeping the apportionment fixed at the proportions used in 2014.

Table 12. ABC apportionment among federal regions for the 2015 ABC.

Area	2014 ABC	Standard apportionment for 2015 ABC	**Recommended fixed apportionment for 2015 ABC***	**Difference from 2014**
Total	13,722	13,657	**13,657**	-0.5%
Bering Sea	1,339	2,210	**1,333**	-0.5%
Aleutians	1,811	1,840	**1,802**	-0.5%
Gulf of Alaska (subtotal)	10,572	9,607	**10,522**	-0.5%
Western	1,480	1,445	**1,473**	-0.5%
Central	4,681	3,975	**4,658**	-0.5%
W. Yakutat**	1,574	1,428	**1,567**	-0.5%
E. Yak. / Southeast**	2,837	2,759	**2,823**	-0.5%

* Fixed at the 2012 assessment apportionment proportions (Hanselman et al. 2012). ** Before 95:5 hook and line: trawl split shown below.

Adjusted for 95:5 hook-and-line: trawl split in EGOA	Year	W. Yakutat	E. Yakutat/Southeast
	2015	1,708 t	2,682 t
	2016	1,552 t	2,436 t

http://www.afsc.noaa.gov/REFM/Docs/2014/BSAIsablefish.pdf

State waters: apportionment and seasons

Major state fisheries take place in Prince William Sound (PWS) and Chatham Strait and Clarence Strait in Southeast Alaska. These are limited entry fisheries. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For Clarence and Chatham Strait fisheries an annual harvest objective is set with regard to survey and fishery catch per unit effort and biological characteristics of the population. In addition, in Chatham Strait an annual stock assessment is performed which includes a mark-recapture estimate of the population abundance.

At the time the federal IFQ program began, the State established two minor fisheries in Cook Inlet and the Aleutian Islands, so that open-access fisheries were available to fishermen that were not allowed to participate in the IFQ program. These fisheries are managed using a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey for the area.

Sablefish are caught primarily with longline gear in Alaska; however, the Clarence Strait area has both a season for pot and longline gear. The Aleutian Islands state fishery allows longline, pot, jig, and hand troll gear, and one trawl vessel qualifies for the limited entry program in Prince William Sound. In federal waters, sablefish are primarily caught in directed fisheries on longline gear; however, an increasing trend toward pot gear exists due to whale depredation of sablefish on longline gear.
http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management

Southeast Alaska

Southeast Alaska fishery management units include the Northern Southeastern Inside (NSEI) subdistrict with Chatham Strait and Southern Southeastern Inside (SSEI) subdistrict with Clarence Strait.

2014 NORTHERN SOUTHEAST INSIDE (NSEI) SUBDISTRICT SABLEFISH FISHERY

ADFG announced that that the 2014 NSEI Subdistrict commercial sablefish fishery annual harvest objective (AHO) is 745,774 round pounds. There are 78 valid Commercial Fisheries Entry Commission (CFEC) permits for 2014, therefore the individual equal quota share (EQS) is 9,561 round pounds (a 26% decrease from the 2013 EQS of 12,848 round pounds). The AHO is based on the sablefish acceptable biological catch (ABC) with decrements made for sablefish mortality in other fisheries.

NSEI sablefish abundance has historically been estimated with a mark-recapture project. As in previous years, an F50% biological reference point (BRP) was used for calculating the 2014 ABC, resulting in a harvest rate of 6.9% (the harvest rate in 2013 was 7.8%). The 2014 ABC (952,538 round pounds) decreased 21% in 2014 relative to the 2013 ABC (1,207,282 round pounds). Factors contributing to this reduction include a decrease in the NSEI mark-recapture

abundance estimate, decreases in fishery and survey weight-at-age, and a reduction in the spawning biomass and harvest rate. The NSEI fishery opened by regulation at 8:00 a.m., August 15, 2014, and is set to close at 12:00 noon, November 15, 2014.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/431292948.pdf

2014 SOUTHERN SOUTHEAST INSIDE SUBDISTRICT (SSEI) SABLEFISH FISHERY

The 2014 Southern Southeast Inside (SSEI) Subdistrict sablefish commercial annual harvest objective (AHO) is 536,618 round lb, a decrease of 8% from the 2013 AHO of 583,280 round lb. ADFG evaluates stock status and establishes the SSEI AHO using commercial fishery and survey catch per unit effort (CPUE) data, fishery and survey biological data (age, weight, length, and maturity), and stock status trends of sablefish populations in surrounding geographic areas.

This decrease in the 2014 AHO is prompted by a declining trend in the SSEI longline survey CPUE for the past several years, record high harvest of immature sablefish in SSEI (>60% in the commercial fisheries and >75% in the longline survey) in the past two years, and historic lows in the adjacent federal Gulf of Alaska domestic sablefish longline survey index. The proportion of immature fish first observed in the 2010 SSEI survey has remained high in the survey and fishery despite the fact that these fish should be maturing and contributing to the spawning biomass over time. The concerns about the high proportion of immature sablefish and the available spawning biomass of the SSEI stock were discussed in the 2011 and 2013 news releases and have contributed to the recommendation to reduce the 2014 AHO.

The department will continue to closely monitor sablefish recruitment trends, age, length, weight and maturity data, as well as survey and fishery performance in SSEI. The SSEI sablefish fishery using longline gear opened at 8:00 a.m., Sunday, June 1, and closed at 12:00 noon, Friday, August 15, 2014. The SSEI sablefish fishery using pot gear opened at 8:00 a.m., Monday, September 1, and closed at 12:00 noon, Saturday, November 15, 2014. Equal quota share (EQS) for each of the 23 permit holders will be 23,331 round pounds. There has been no change in the number of permit holders since 2013.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/390185246.pdf

Prince William Sound

The 2014 PWS sablefish season opened on April 15th with a 242,000 lb guideline harvest level (GHL). Fishing may occur in Inside District waters only and season dates are April 15 - August 31. The fishery is managed via quota allocations among vessel size permit classes as specified in regulation 5 AAC 28.272. The table below indicates the number of registered permits, quota allocation in round weight and dressed (eastern cut) weight by permit category.

Permit Category	Registered Permits	Quota Round (lb)	Quota Dressed (lb)
A & B	4	7,932	4,997
C	36	4,691	2,955
D	12	3,450	2,174

http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/392431311.pdf

Cook Inlet

The Cook Inlet Area sablefish season opened at 12:00 noon July 15th 2014 with a 56,000 pound guideline harvest level (GHL). A season closure will be announced when harvest projections indicate achievement of the GHL. The fishery GHL is adjusted each year in proportion to the annual percentage change in the Central Gulf of Alaska (CGOA) Acceptable Biological Catch (ABC) for sablefish set by the NPFMC for federal waters of the CGOA. The ABC is based on biomass estimates generated from annual surveys conducted by NMFS in the Gulf of Alaska. In the latest survey conducted in 2013, biomass estimates decreased by 15% and therefore the GHL for the Cook Inlet Management Area has also decreased by 15% from the 2013 GHL of 66,000 lb.

http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/423840827.pdf

Aleutian Islands

The state-waters sablefish season in the Aleutian Islands opened to commercial fishing at 2:00 noon on March 8, 2014 in conjunction with the federal IFQ season. The state-waters sablefish season will close when the guideline harvest level (GHL) is reached or on November 7, 2014 if the GHL is not reached. The 2014 Aleutian Islands state-waters sablefish fishery GHL is 347,000 pounds.

http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/384995846.pdf

Registration and Logbook Requirements

Alaska fishermen must register prior to fishing and are required to keep a logbook during the fishery. Logbooks must include, by set, the date and time gear is set and retrieved, specific location of harvest by latitude and longitude for start and ending positions, hook spacing, amount of gear (number of hooks or skates) used, depth of set, estimated weight of the target species, and the estimated weight of bycatch by species. Indicate for each set if the target species was sablefish or halibut and if there was any lost gear. A permit holder must retain all visibly injured or dead sablefish. Sablefish that are not visibly injured or dead may be released unharmed, and the permit holder must record in the logbook, by set, the number of live sablefish released. Record discard reason, e.g. fish are small, PQS has to be met [5 AAC 28.170(f)].

Fishing gear

Sablefish are caught primarily with longline gear in Alaska. The vast majority is caught in the GOA, as shown in the figure below.

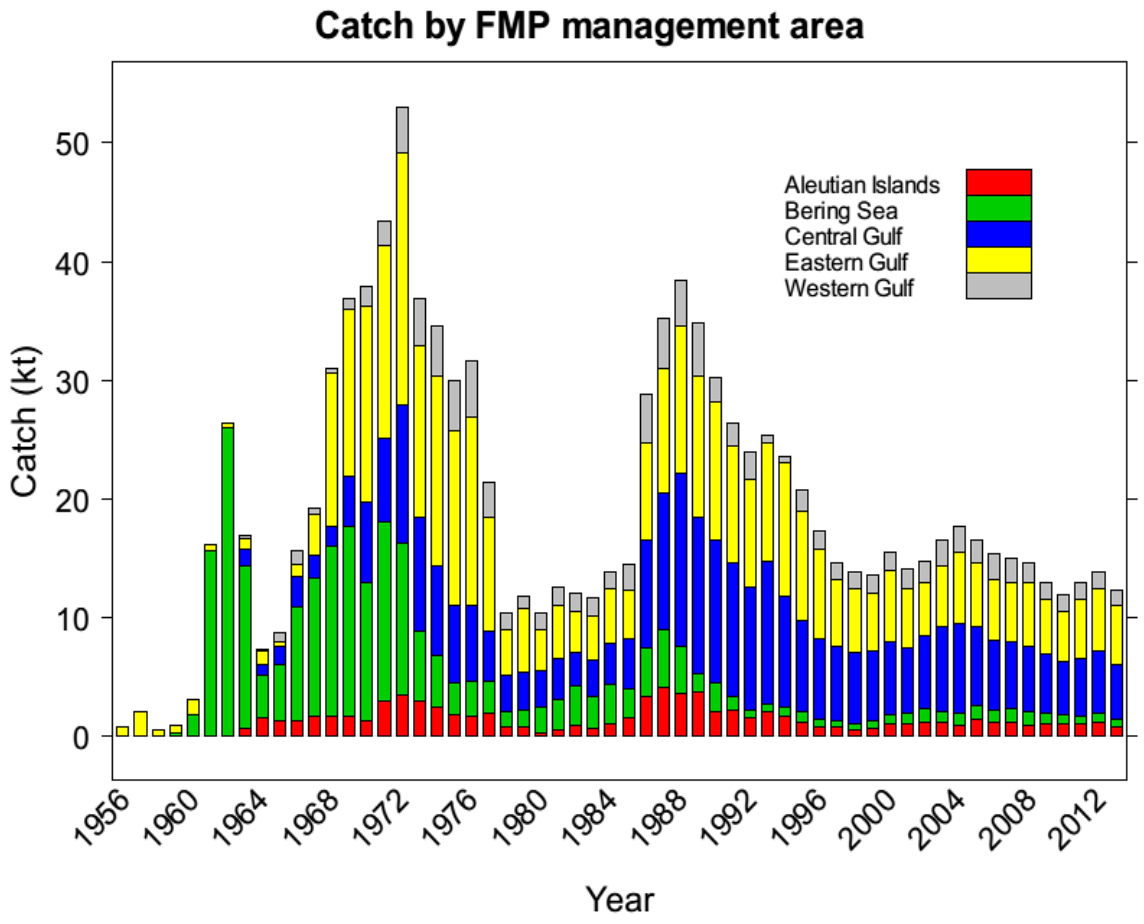


Figure 11. Sablefish fishery total reported catch (kt) by the NPFMC area and year.

In federal waters, sablefish are primarily caught in directed fisheries on longline gear; however, an increasing trend toward pot gear exists due to whale depredation of sablefish on longline gear. Pot fishing occurs in the BSAI but not currently in the GOA. In addition, sablefish are caught as bycatch in trawl fisheries. Pot fishing in the BSAI accounts for nearly half of the Individual Fishing Quota (IFQ) catch in those areas, as can be seen in the table below.

Table 13. Catch (tons) by gear type in the Aleutian Islands and Bering Sea from 2010 to 2013

Aleutian Islands				
Year	*Pot*	*Trawl*	*Longline*	*Total*
2010	59	74	943	1076
2011	141	47	831	1019
2012	78	148	973	1199
2013	12	52	764	828

Bering Sea				
Year	*Pot*	*Trawl*	*Longline*	*Total*
2010	452	30	272	754
2011	405	44	246	695
2012	431	93	216	740
2013	331	130	139	600

Fixed gear (longlines and pots) harvests approximately 90% of the sablefish quota and trawl gear approximately 10%. The trend is fairly stable in recent years up to 2013, as shown in the figure below.

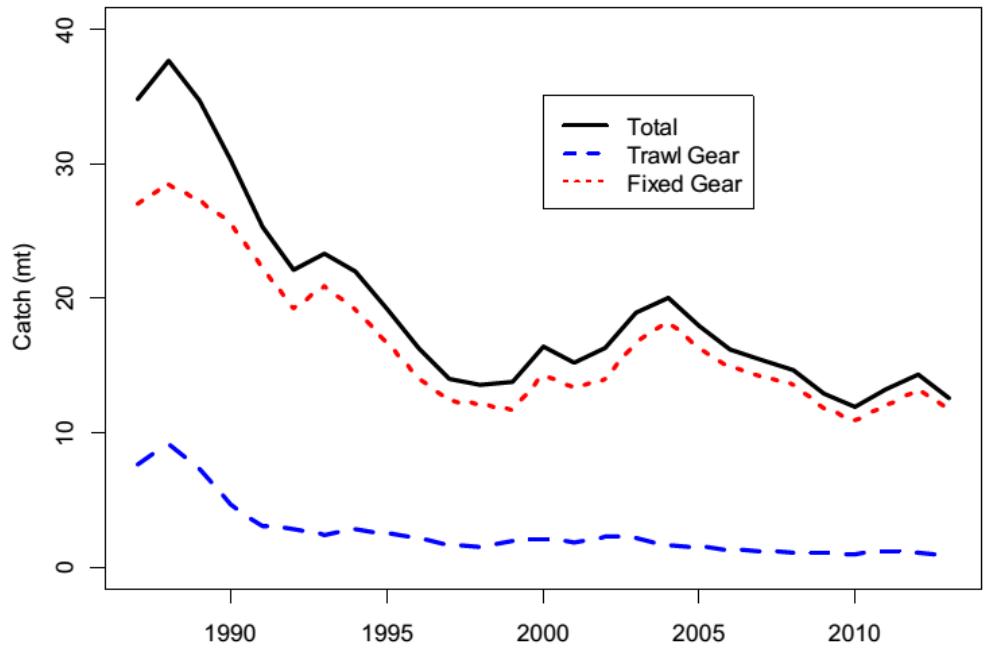


Figure 12. Catch of Alaska sablefish by gear type.
http://www.afsc.noaa.gov/REFM/Docs/2013/GOAsablefish.pdf

State managed sablefish caught in the Clarence Strait area has both a season for pot and longline gear. Furthermore, the Aleutian Islands state fishery allows longline, pot, jig, and hand troll gear (latter two allowed but no directed fishing currently occurs with these gears), and one trawl vessel qualifies for the limited entry program in Prince William Sound (http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management).

Pot gear

Pot fishing for sablefish has increased in the Bering Sea and Aleutian Islands 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 Bering Sea and Aleutian Islands. Since 2004, pot gear has accounted for over half of the Bering Sea fixed gear IFQ catch and up to 34% of the catch in the Aleutians. Since 2013, the NPFMC is considering allowing the use of pot gear in the Gulf of Alaska also.

In December 2014 the NPFMC released an Initial Review Draft Environmental Assessment/ Regulatory Impact Review/ Initial Regulatory Flexibility Analysis for a Proposed Amendment to the Fishery Management Plan for Groundfish of the Gulf of Alaska and Federal regulations implementing the sablefish and Pacific halibut fisheries off Alaska to allow the use of pot longline gear in the Gulf of Alaska Sablefish Individual Fishing Quota Fishery. The document analyzes proposed management measures that would apply exclusively to the sablefish (*Anoplopoma fimbria*) Individual Fishing Quota (IFQ) fishery in the GOA. The measures under consideration include: (1) redefine legal gear to include pot longline gear, potentially subject to a pot limit, (2) require retention of Pacific halibut (*Hippoglossus stenolepis*) if sufficient IFQ is held by fishermen to cover both the sablefish and halibut IFQ caught using pot longline gear, (3) limit the retention of halibut in sablefish IFQ pot longline gear to incidental catch only (e.g., maximum retainable amount), (4) require removal of pot longline gear (when not fishing with a vessel size exemption) to minimize grounds preemption, and (5) require marking of pot longline gear.

The proposed action would minimize fishery interactions and potential entanglements with marine mammals and seabirds, and adverse impacts on the sablefish IFQ fleet from depredation by sperm whales (*Physeter macrocephalus*) and killer whales (*Orcinus orca*). Depredation has negative consequences for the sablefish IFQ fleet through reduced catch rates and increased operating costs. Depredation also has negative consequences for the whales through increased risk of vessel strike, gear entanglement, and altered foraging strategies. An additional management concern stems from the impact that whale depredation may have on the accuracy of fish stock abundance indices.

(Reference: December 2014 GOA Sablefish Pot Longline Gear Initial Review)

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). 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:

(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).

The Alaska Administrative Code 5 AAC 39.145, as well as federal regulations under 50 CFR 679.2 state that pot gear in Alaska crab and bottomfish fisheries is required to have an escape mechanism consisting of an opening closed by 100% cotton twine no larger than 30-thread.
http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter039/section145.htm
https://alaskafisheries.noaa.gov/regs/679a2.pdf

Longline gear

Longline gear and the manner of fishing have been developed over a long period of time to be selective of target species. As an example, specific regulations were put in place intended to reduce the incidental mortality of the short-tailed albatross and other seabird species with revision in 1996 and 2001. The short-tailed albatross is a listed species under the Endangered Species Act (ESA). The BOF enacted changes to state law, mirroring federal regulations within state waters for groundfish fisheries. These measures now include the regulatory use of streamer (tory) lines, night setting, line shooter and lining tubes, and have been shown to reduce seabird interactions very significantly when setting or retrieving gear. The 1996 regulation imposing paired streamer lines and integrated weighted groundlines were nearly 100% effective at eliminating the catch of albatrosses and other surface feeding birds, resulting in an eight-fold decrease in seabird mortality. The trend in seabird catch is variable but appears to be decreasing further, presumably due to widespread use of these measures to reduce bycatch.
Under the Individual Quota Fishery system in Alaska's federal fisheries and the equal quota share in the major state waters fisheries, much less gear is used and consequently lost than in the historical race for fish scenario. Market forces also help to ensure that gear is cost effective.
http://alaskafisheries.noaa.gov/protectedresources/seabirds/bycatchregs.htm

Trawl gear

By regulation, there is no directed trawl fishery for sablefish. However, directed fishing standards have allowed some trawl hauls to target and retain sablefish, where the bycatch is similar to the longline fishery, in addition, perhaps, to some deep dwelling flatfish (https://alaskafisheries.noaa.gov/habitat/efh/review/appx1.pdf).

The bottom trawl gear in the BSAI has been modified (regulation effective January 20th 2011, see Amendment 94 to the BSAI FMP) according to regulation to have elevating devices (bobbins) which

has been shown to reduce the impact on both the seafloor (up to 90%) and the associated non-target invertebrates (e.g. king crabs). Effective from February 18th 2014, Amendment 89 to the GOA groundfish FMP, revised regulations governing the configuration of modified nonpelagic trawl gear. This rule requires that nonpelagic trawl gear used in the directed flatfish fisheries in the Central Regulatory Area of the GOA be modified to raise portions of the gear off the sea floor, in the same manner as established in the BSAI three years earlier.
The modifications to nonpelagic trawl gear used in these fisheries will reduce the unobserved injury and mortality of Tanner crab, and will reduce the potential adverse impacts of nonpelagic trawl gear on bottom habitat. Finally, this rule makes a minor technical revision to the modified nonpelagic trawl gear construction regulations to facilitate gear construction for those vessels required to use modified nonpelagic trawl gear in the GOA and Bering Sea groundfish fisheries.

http://alaskafisheries.noaa.gov/frules/75fr61642.pdf
http://www.gpo.gov/fdsys/pkg/FR-2014-01-16/html/2014-00780.htm

The NMFS and the ADFG have well-established regulations on fishing seasons and legal gear use. Discards of sablefish tend to be small and these are accounted for toward the overall TAC by observer coverage data. Management measures and operational methods (i.e. Maximum Retainable Amounts and Prohibited Species Catch) are in place to account for bycatch and discards of encountered bycatch species. The trawl fishery operates under strict MRAs for sablefish.

9. There shall be defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels.

FAO CCRF 7.1.8/7.6.3/7.6.6/8.4.5/8.4.6/8.5.1/8.5.3/8.5.4/8.11.1/12.10
FAO Eco 29.2bis

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of B40%), placing sablefish in sub-tier "b" of Tier 3. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC ≤ ABC < OFL. The harvest control rule is designed to ensure the population is capable of producing MSY.

The Magnuson-Stevens Fishery Conservation and Management Act (or in short Magnuson-Stevens Act, MSA) is the primary domestic legislation governing management of the nation's marine fisheries. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the GOA and the BSAI which incorporate the sablefish fisheries in those regions.

(http://icesjms.oxfordjournals.org/content/67/9/1861.full.pdf?keytype=ref&ijkey=Rr1hA2GwWtqE2TZ)
http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf (last modified Apr. 2014)
http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf (last modified Jan. 2014)

Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$.

Projected female spawning biomass (combined areas) for 2014 is 91,212 t (86% of B40%), placing sablefish in sub-tier "b" of Tier 3.

SAFE stock assessors estimated the posterior probability that projected abundance will fall, or stay below thresholds of 17.5% (MSST), and 35% (MSY), and 40% (*Btarget*) of the unfished spawning biomass based on the posterior probability estimates. For management, it is important to know the risk of falling under these thresholds. The probability that spawning biomass falls below key

biological reference points was estimated based on the posterior probability distribution for spawning biomass. The probability that next year's spawning biomass was below *B35%* was 0.89. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.95 (up from 0.7 last year), and the probability of staying below B40% is near 100% (http://www.afsc.noaa.gov/REFM/Docs/2013/GOAsablefish.pdf).

In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA.

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. The management system for the NPFMC groundfish fisheries is a complex suite of measures comprised of harvest controls—e.g., OY, ACL, ABC, TAC, OFL—effort controls (IFQs, licenses, cooperatives), time and/or area closures (i.e. gear closures, habitat protection measures, marine reserves), bycatch controls (Maximum Retainable Amounts (MRA), PSC limits, retention and utilization requirements), monitoring and enforcement (observer program, USCG), social and economic protections, and rules responding to other constraints (e.g. seabirds gear modifications). http://icesjms.oxfordjournals.org/content/67/9/1861.full.pdf?keytype=ref&ijkey=Rr1hA2GwWtqE2TZ

The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC ≤ ABC < OFL.

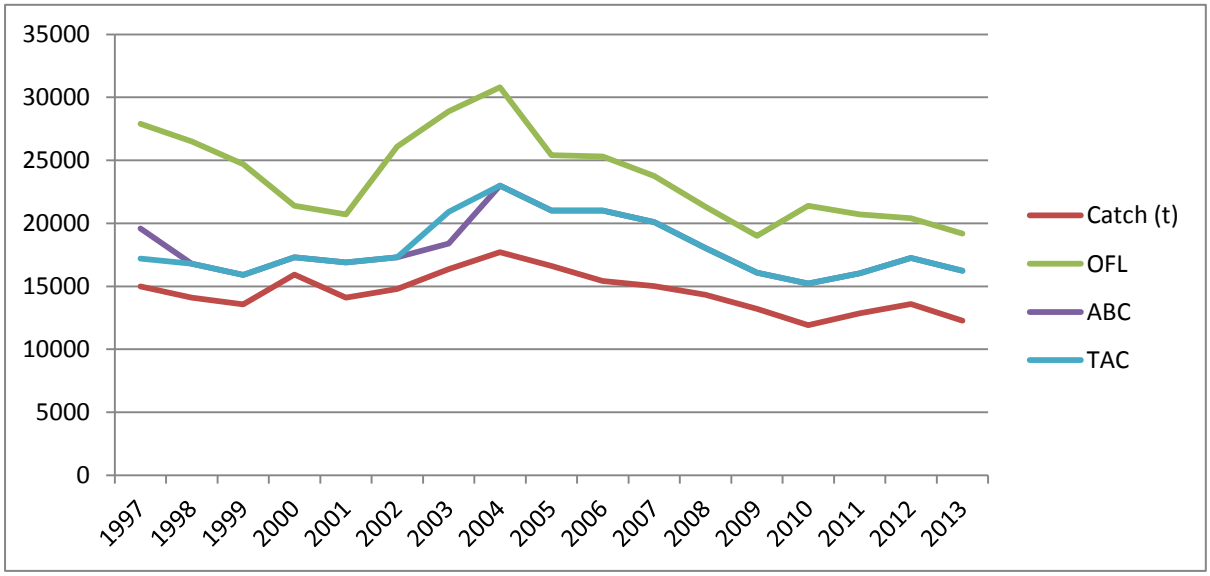


Figure 13. OFL, ABC, TAC and catch levels for the sablefish fishery from 1997 to 2013. (Adapted from table 3.7; AK Sablefish SAFE Report, Dec. 2013).

Under the individual fishing quota share system in place for the sablefish fishery, fishing capacity (vessels and gear) has been reduced. Through a public process at the NPFMC, extensive staff analysis was presented, analyzed, and data confirmed to ensure that the proposed level of fishing was commensurate with the sustainable use of the fishery resource. The number of vessels, and the class of those vessels, established qualifications for a fishing fleet with less capacity and with ownership in the resource. With the implementation of IFQs in the fishery off Alaska, the derby type fishery was eliminated. Seasons were extended and wastage was reduced in the sablefish fishery. In the mid-1980s industry made the operational switch from J-hooks to circle hooks in the commercial fishery, lowering the mortality of bycaught sablefish caught and released during commercial fishing (in both IFQ fisheries).

http://alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf
https://alaskafisheries.noaa.gov/ram/ifq/ifqpaper.htm
http://www.fakr.noaa.gov/regs/679d42.pdf

10. Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards and guidelines and regulations.

FAO CCRF 8.1.7/8.1.10/8.2.4/8.4.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

Any aspirant sablefish fisherman must have 150 days of sablefish fishing experience before being able to purchase sablefish IFQs. Obtaining sablefish IFQ share most often will require the purchaser to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. Several training opportunities are available to train crew members in Alaska.

Any aspirant sablefish fisherman must have 150 days of sablefish fishing experience before being able to purchase sablefish IFQs. Obtaining sablefish IFQ share most often will require the purchaser to enter into loan capital arrangements with banks that will require comprehensive fishing business plans supported by competent, professional fishermen with demonstrable fishing experience. This competence and professionalism is a learned experience with the culmination of entrants into the fishery starting at deck hand level working their way up through proof of competence.

In addition to the practical training necessary to enter the fishing industry, the NPFMC and Board of Fisheries meetings are public and the process involves extensive industry representation for input in the management process and the drafting of new regulation in a changing conservation environment. Through selected industry representation at these meetings, individual fishermen are kept up to date and remain aware of new requirements for fisheries as they arise.

The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska's Institute of Technology). One of AVTEC's main divisions is the Alaska Maritime Training Center. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry.
http://www.avtec.edu/amtc-cost.aspx

The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training (STCW is the international Standards of Training, Certification, & Watchkeeping). In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of world class ship simulator, state of the art computer based navigational laboratory, and modern classrooms equipped with the latest instructional delivery technologies. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals.

The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training

in several sectors, including fisheries management, in the forms of seminars and workshops. http://seagrant.uaf.edu/map/fisheries/

In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit (AYFS). Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation, to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. The summit provides three days of training in the land-based aspects of running a fishing operation: marketing, business management, the fisheries regulatory process, and the science impacting fisheries management, a visit to the Anchorage office of the Alaska Department of Fish & Game, where participants can meet with fisheries managers and researchers. https://seagrant.uaf.edu/map/workshops/2013/ayfs/

Finally, the Alaska Marine Safety Education Association (AMSEA) provides courses on small boating safety, drill conductor training, stability and damage control, ergonomics, dredger safety and survival at sea training. http://www.amsea.org/

E. Implementation, Monitoring and Control

11. An effective legal and administrative framework shall be established and compliance ensured through effective mechanisms for monitoring, surveillance, control and enforcement for all fishing activities within the jurisdiction.

FAO CCRF 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1
FAO Eco 29.5

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska federal fisheries laws and regulations, especially 50CFR679. The federal violations in this fishery are reported to and investigated by NOAA's Office of Law Enforcement's Alaska Division and prosecuted by NOAA's Office of General Counsel's Enforcement Section. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). The Alaska Wildlife Troopers (AWT) enforce state regulations.

The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations in federal waters, especially 50CFR679.

Table 14 displays specific at-sea IFQ violations from 2005 through 2012. These selected violations are those that have persisted over time. Other violations are not included because they are occasional or of minor administrative discrepancies. During 2012, of 235 boardings at sea, USCG personnel cited 8 vessels for 8 violations. The eight significant commercial IFQ violations in 2012 were for not maintaining continuous transit during a closed period, failure to use seabird avoidance gear, fishing without an IFQ permit, logbook discrepancy and subsistence violation of fishing with too many hooks.

Table 14. At-sea IFQ violations in Alaska, 2005-2012.

Violation Type	2012 Violations (8 on 8 vessels)	2011 Violations (23 on 13 vessels)	2010 Violations (21 on 17 vessels)	2009 Violations (10 on 10 vessels)	2008 Violations (5 on 5 vessels)	2007 Violations (20 on 19 vessels)	2006 Violations (20 on 19 vessels)	2005 Violations (10 on 8 vessels)
Not maintaining continuous transit during a closed period	1	0	0	0	0	0	0	0
Failure to use Seabird Avoidance Gear	1	0	0	0	0	0	0	0
Fishing in Closed Area	0	1	1	2	0	0	0	0
FFP/IFQ Permit/Cardholder not onboard	0	7	1	1	0	2	4	5
Expired FFP	0	0	0	1	0	0	0	0
Boarding Ladder	0	0	0	1	0	0	0	0
Insufficient seabird avoidance	0	0	0	0	0	2	7	3
Logbook discrepancy	2	8	7	5	3	5	5	2
Fishing for Halibut without a Permit	3	0	0	0	0	0	0	0
Subsistence fishing with too many hooks	1	0	0	0	0	0	0	0

http://alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf

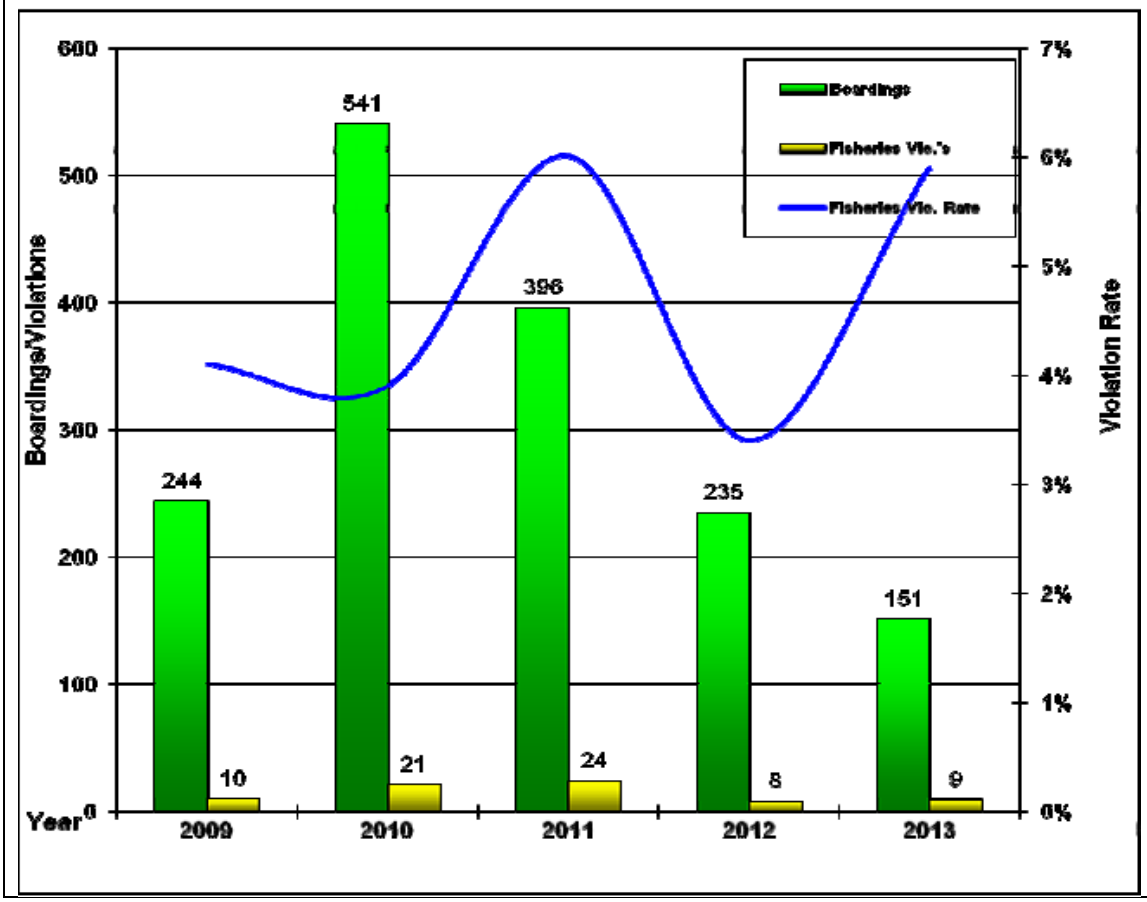


Figure 14. 2009-2013 IFQ enforcement actions (boardings in green, fisheries violations in yellow and fisheries violations rate in blue) by the USCG. Note this is a combination of Alaska Pacific halibut and sablefish IFQ fisheries (see USCG 2013 End of Year report on http://www.npfmc.org/summary-reports/).

NMFS OLE

NOAA Office of Law Enforcement Special Agents and Enforcement Officers perform a variety of tasks associated with the protection and conservation of Alaska's living marine resources. In order to enforce these laws, OLE special agents and enforcement officers conduct investigations and use OLE patrol vessels to board vessels fishing at sea, and conduct additional patrols on land, in the air and at sea in conjunction with other local, state and Federal agencies. In any given year, OLE Agents and Officers spend an average 10,000-11,000 hours conducting patrols and investigations, and an additional 10,000-11,000 hours on outreach activities. The OLE maintains 19 patrol boats around the country to conduct a variety of patrols including Protected Resources Enforcement Team (PRET) boardings, protection of National Marine Sanctuaries and various undercover operations.

http://www.nmfs.noaa.gov/ole/docs/2012/ole_workforce_analysis_plan.pdf

OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). GCEL can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPs) or Notice of Violation and Assessment (NOVAs), or they can refer the case to the U.S. Attorney's Office for criminal proceedings.

http://www.gc.noaa.gov/documents/Penalty%20Policy_FINAL_07012014_combo.pdf

For perpetual violators or those whose actions have severe impacts upon the resource criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the United States Attorney's Office. All landings of sablefish must be reported to NMFS via its mandatory "e-landings" reporting system. Registered Buyers must report IFQ landings electronically using the Internet (with permission, a backup paper submission system is available for contingencies such as system outages). Real-time accounting of individual harvests contributes significantly to accurate and timely management of each IFQ holder's IFQ accounts and supports inseason transfers. Of two Internet systems available, the more comprehensive one, the Interagency Electronic Reporting System (IERS) and its data-entry component, *e*Landings, is the standard reporting method.

The largest change in reporting methods took place in 2008, when reporting through IERS jumped to 96 percent from 61 percent due to NMFS outreach through several statewide workshops. During 2012, outreach and interagency coordination continued as several staff on the eLandings team provided training to CDQ groups and met with field staff from ADFG and the IPHC to coordinate reporting and record-keeping issues, data query tools, and user support for eLandings. In 2012,

Registered Buyers reported 96% of the IFQ harvest electronically which has made the data collection more efficient and accurate. Although reporting methods have changed significantly, some users will continue to depend on both manual and NMFS Web reporting.
http://alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf

Commercial harvests of pollock, halibut and sablefish are the primary enforcement responsibilities of OLE. The IFQ, Observer and Record Keeping/Reporting programs are the foundations of the Alaska Division program responsibilities. Endangered Species Act and Marine Mammal Protection Act priorities include the Steller sea lion and Cook Inlet beluga populations in addition to many other protected resources.

OLE Alaska Division Priorities for 2013

Magnuson-Stevens Act

High Priority
- Observer assault, harassment, or interference violations
- Felony and major civil cases involving significant damage to the resource or the integrity of management schemes
- Commercialization of sport-caught or subsistence halibut
- Maritime Boundary Line incursions by foreign fishing or transport vessels
- Outreach and education

Medium Priority
- Misdemeanor and civil cases involving observer coverage violations
- Closed Area/VMS Violations, ongoing
  - Commercial vessel incursions into closure areas or other Marine Protected Areas
- Recordkeeping and reporting violations that impact data consistency or integrity
- Violations involving lesser damage to the resource or the integrity of management schemes

Low Priority
- Catch reporting and trip limits
  - Noncompliance with trip and cumulative limits and record keeping requirements for landings of federally managed marine species, and specifically catch share programs.
- Gear violations
  - Deployment of unlawful gear utilized in commercial fisheries under NOAA's jurisdiction.
- Lesser permit violations

Endangered Species Act and Marine Mammal Protection Act

High Priority
- Violations wherein responsible subject and species are identifiable
- Lethal takes, Level A harassment with the potential to injure marine mammal stock
  - Species of interest are Cook Inlet beluga, other whale species, northern fur seal, or Steller sea lion
- Any violation involving injury or potential injury to people, such as a vessel-whale collision
- Outreach and Education

Medium Priority
- Non-lethal takes, Level B harassment with the potential to disturb a marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering
- Species is threatened rather than endangered

Low Priority
- Violations wherein responsible subject is not identifiable
- Injured or dead animal cannot be located
- Objective evidence is not obtainable
- Takes of individual marine mammal species that appear consistent with legal harvest by Alaska Natives

International/Lacey Act

High Priority

- Felony and major civil violations (e.g., interstate or foreign trafficking of commercial quantities of illegally harvested fish or marine resources)
- Harvest or transshipment of marine resources by foreign fishing vessels
- Domestic or international violations involving seafood safety; substantive mislabeling of product in domestic or international commerce
- IUU listed vessels

Medium Priority

- Misdemeanor and civil violations (e.g., interstate or foreign trafficking of small quantities of illegally harvested fish or marine resources)
- Mislabeling violations
- IUU identified product

Low Priority

- Minor mislabeling violations
- Violations wherein responsible subject/vessel not identifiable

http://www.nmfs.noaa.gov/ole/docs/2013/ole-division-priorities-2013-final.pdf

The Alaska Wildlife Troopers (AWT) and ADFG enforce fisheries regulations in state waters.

http://dps.alaska.gov/awt/Marine.aspx

12. There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.

FAO CCRF 7.7.2/8.2.7

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations: ***1)*** *Issuance of a citation (a type of warning), usually at the scene of the offense,* ***2)*** *Assessment by the Administrator of a civil money penalty,* ***3)*** *for certain violations, judicial forfeiture action against the vessel and its catch,* ***4)*** *Criminal prosecution of the owner or operator for some offenses. In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA.The Alaska Wildlife troopers enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation*.

The Magnuson-Stevens Act provides four basic enforcement remedies for violations (50CFR600.740 Enforcement policy).

(1) Issuance of a citation (a type of warning), usually at the scene of the offense (15 CFR part 904, subpart E).

(2) Assessment by the Administrator of a civil money penalty.

(3) For certain violations, judicial forfeiture action against the vessel and its catch.

(4) Criminal prosecution of the owner or operator for some offenses.

In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the Magnuson-Stevens Act treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

Magnuson Stevens Act Penalty Matrix.

Magnuson-Stevens Penalty Matrix

	Level of Intent			
Harm to the Resource or Regulatory Program, Offense Level	**A Unintentional**	**B Negligent**	**C Reckless**	**D Willful**
I	Written warning-$1,000	Written warning-$1,500	Written warning-$2,000	Written warning-$2,500
II	Written warning-$2,000	$2,000-$5,000	$5,000-$10,000	$10,000-$15,000

III	$2,000-$5,000	$5,000-$10,000	$10,000-$15,000	$15,000-$25,000
IV	$5,000-$15,000	$15,000-$25,000	$25,000-$50,000 and permit sanction of 10-20 days*	$50,000-$80,000 and permit sanction of 20-60 days*
V	$15,000-$25,000	$25,000-$50,000 and permit sanction of 10-20 days*	$50,000- $80,000 and permit sanction of 20-60 days*	$60,000- $100,000 and permit sanction of 60-180 days*
VI	$25,000-$50,000	$50,000-$80,000 and permit sanction of 20-60 days*	$60,000-$100,000 and permit sanction of 60-180 days*	$100,000-statutory maximum and permit sanction of 1 year-permit revocation*

http://www.nmfs.noaa.gov/sfa/reg_svcs/Councils/ccc_2011/Tab%20L%20-%20Enforcement%20Issues/Enforcement%20Issues.pdf

On March 16, 2011, NOAA issued a new Penalty Policy that provided guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. In that Policy, the NOAA General Counsel's Office committed to periodic review of the Penalty Policy to consider revisions or modifications as appropriate.

The July 2014 revised version of the Penalty Policy is a result of that review. The purpose of the 2014 Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources.

Under the new revised Policy, NOAA expects to continue to promote consistency at a national level, provide greater predictability for the regulated community and the public, maintain transparency in enforcement, and more effectively protect natural resources. The effective date of this Policy was July 1, 2014. This Policy supersedes all previous guidance regarding the assessment of penalties or permit sanctions, and all previous penalty and permit sanction schedules issued by the NOAA Office of the General Counsel. Currently pending cases charged under the March 16, 2011 Penalty Policy, will continue to be governed by that Policy until those cases have been finally adjudicated.
While the overall approach to this revised Penalty Policy remains largely the same, notable changes to the previous Penalty Policy issued on March 16, 2011 include:
(1) Addition of more detail in some penalty schedules to better describe the most commonly occurring violations;
(2) Clearer distinctions among multiple-level violations to ensure consistent application of the Penalty Policy;
(3) Revision of the treatment of prior violations so that prior adjudicated violations older than 5 years are no longer considered an aggravating factor;
(4) Ensuring consistent application of the Penalty Policy to recreational offenses by replacing the commercial/recreational distinction as a penalty adjustment factor with the additional Level I and II

penalties that capture recreational violations;
(5) Creating a new penalty adjustment for "such other matters as justice may require" by combining the "Activity After Violation" factor with new considerations.

The new 2014 revised Policy provides guidance for the NOAA Office of the General Counsel, but does not, nor is it intended to, create a right or benefit, substantive or procedural, enforceable at law or in equity, in any person or company. The basis for penalties calculated under this Policy, however, will be included in charging documents filed by the Agency. Further, although this Policy provides guidance regarding the assessment of proposed penalties and permit sanctions, NOAA retains discretion to assess the full range of penalties authorized by statute in any particular case.

For significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's office for criminal prosecution.

http://www.gc.noaa.gov/documents/Penalty%20Policy_FINAL_07012014_combo.pdf

The Alaska Region Summary Settlement and fix-it schedule is available at this page http://www.gc.noaa.gov/enforce-office3.html under the Alaska region tab.

The Alaska Wildlife troopers enforce state water regulations. Here below are presented some of the statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation.

AS 16.05.165. Form and issuance of citations
AS 16.05.170 Power to execute warrant
AS 16.05.180 Power to search without warrant
AS 16.05.190 Seizure and disposition of equipment
AS 16.05.195 Forfeiture of equipment
AS 16.05.332 Wildlife Violator Compact
AS.16.05.410 Revocation of license
AS 16.05.710 Suspension of Commercial License and Entry Permit
AS 16.05.722 Strict liability commercial fishing penalties
AS 16.05.723 Misdemeanor commercial fishing penalties
AS 16.05.896 Penalty for causing material damage
AS 16.05.901 Penalty for violations of AS 16.05.871 – AS 16.05.896.
AS 16.05.030 Penalty for violation of 16.10.010-16.10.050
AS 16.10.090 Penalty for violation of AS 16.10.090
AS 16.10.220 Penalty for violation of AS 16.10-200-16.1-.210
AS 16.10.790 Fines

AS 16.40.290 Penalty
AS 16.43.960 Commission revocation or suspension of permits
AS 16.43.970 Penalties

These are under Alaska Statutes Title 16 (laws); Alaska Administrative Code Title 5 (regulations).
http://www.legis.state.ak.us/basis/aac.asp#TitleTable

Finally, the cooperation of citizens and industry is cultivated through programs such as AWT's Fish & Wildlife Safeguard program, which encourages the reporting of violations, and "leverages" the range of enforcers.

At each of the five annual Council meetings, representatives of the USCG, OLE, NMFS, ADFG and AWT meet in an Enforcement Meeting where enforcement concerns with plan amendments are discussed and materials relating to those concerns are prepared for the Council. During staff reports to the Council the USCG and the OLE present information about vessel boardings and enforcement violations by the fishing industry that occurred since the last Council meeting.

50CFR600.740 Enforcement policy
http://dps.alaska.gov/awt/mission.aspx

F. Serious Impacts of the Fishery on the Ecosystem

13. Considerations of fishery interactions and effects on the ecosystem shall be based on best available science, local knowledge where it can be objectively verified and using a risk based management approach for determining most probable adverse impacts. Adverse impacts on the fishery on the ecosystem shall be appropriately assessed and effectively addressed.

FAO CCRF 7.2.3/8.4.7/8.4.8/12.11

Eco 29.3/31

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating Determination

The NPFMC and NOAA/NMFS conduct assessments and research related to fishery impacts ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document, annual Ecosystem Considerations documents, and the various other research reports. The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that the benthic longline and pot fisheries have minimal or temporary impacts on sablefish habitat. Various studies have applied ecosystem models to food webs and impacts of climate change. Sablefish have low discard rates in other fisheries. The directed sablefish fishery takes significant amounts of grenadiers, arrowtooth flounder, spiny dogfish, sharks and some rockfish; but the fishery does not pose a threat to bycatch species. Management measures limit interactions with seabirds and the fishery has minimal impact on the short-tailed albatross, the only seabird listed as endangered under the ESA. Interactions with whales remain a problem as they take fish off longline gear, but the fishery does not adversely affect whale populations.

Research and institutional capacity

NPFMC and NOAA/NMFS conduct assessments and research on environmental factors as affected by the commercial sablefish fishery and associated species and their habitats. Findings and conclusions are published annually in the Ecosystem Considerations section of the SAFE report.

The SAFE reports include sablefish sections for 1) ecosystem effects on the stock and 2) effects of the fishery on the ecosystem. NOAA's Fishery and the Environment (FATE) program and Resource Ecology and Ecosystem Management (REEM) group sponsors an Alaska Marine Ecosystem Considerations webpage that provides the latest SAFE Ecosystems Considerations report plus recent research findings and resources.

Ecosystem considerations

Table 15. Summary of the ecosystem considerations for the sablefish fisheries.

Indicator	*Observation*	*Interpretation*	*Evaluation*
ECOSYSTEM EFFECTS ON STOCK			
Prey availability or abundance trends			
Zooplankton	None	None	Unknown
Predator population trends			
Salmon	Decreasing	Increases the stock	No concern
Changes in habitat quality			
Temperature regime	Warm increases recruitment	Variable recruitment	No concern (can't affect)
Prevailing currents	Northerly increases recruitment	Variable recruitment	No concern (can't affect)
FISHERY EFFECTS ON ECOSYSTEM			
Fishery contribution to bycatch			
Prohibited species	Small catches	Minor contribution to mortality	No concern
Forage species	Small catches	Minor contribution to mortality	No concern
HAPC biota (seapens/whips, corals, sponges, anemones)	Small catches, except long-term reductions predicted	Long-term reductions predicted in hard corals and living structure	Possible concern
Marine mammals and birds	Bird catch about 10% total	Appears to be decreasing	Possible concern
Sensitive non-target species	Grenadier, spiny dogfish, and unidentified shark catch notable	Grenadier catch high but stable, recent shark catch is small	Possible concern for grenadiers
Fishery concentration in space and time	IFQ less concentrated	IFQ improves	No concern
Fishery effects on amount of large size target fish	IFQ reduces catch of immature	IFQ improves	No concern
Fishery contribution to discards and offal production	sablefish <5% in longline fishery, but 30% in trawl fishery	IFQ improves, but notable discards in trawl fishery	Trawl fishery discards definite concern
Fishery effects on age-at-maturity and fecundity	trawl fishery catches smaller fish, but only small part of total catch	slightly decreases	No concern

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

Fishery interactions with the ecosystem

Fishery-specific contribution to bycatch of prohibited species, forage species, Habitat Area of Particular Concern (HAPC) biota, marine mammals and birds, and other sensitive non-target species:

- The sablefish fishery catches significant portions of the spiny dogfish and unidentified shark total catch, but there is no distinct trend through time. The sablefish fishery catches the majority of grenadier total catch, but the trend is decreasing. The trend in seabird catch is variable but appears to be decreasing, presumably due to widespread use of measures to

reduce seabird catch. Prohibited species catches (PSC) in the targeted sablefish fisheries are dominated by halibut (1,090 t/year) and golden king crab (134,000 individuals/year). Halibut catches were steady in 2011, while golden king crab catches jumped from 26,000 to 191,000 individuals in 2011. The shift from an open-access to an IFQ fishery has increased catching efficiency which has reduced the number of hooks deployed (Sigler and Lunsford 2001). Although the effects of longline gear on bottom habitat are poorly known, the reduced number of hooks deployed during the IFQ fishery must reduce the effects on benthic habitat. The IFQ fishery likely has also reduced discards of other species because of the slower pace of the fishery and the incentive to maximize value from the catch.

Fishery-specific concentration of target catch in space and time relative to predator needs in space and time (if known) and relative to spawning components:

- The sablefish fishery largely is dispersed in space and time. The longline fishery lasts 8-1/2 months. The quota is apportioned among six regions of Alaska.

Fishery-specific effects on amount of large size target fish:

- The longline fishery catches mostly medium and large-size fish which are typically mature. The trawl fishery, which on average accounts for about 10% of the total catch, often catches slightly smaller fish. The trawl fishery typically occurs on the continental shelf where juvenile sablefish sometimes occur. Catching these fish as juveniles reduces the yield available from each recruit.

Fishery-specific contribution to discards and offal production:

- Discards of sablefish in the longline fishery are small, typically less than 5% of total catch. The catch of sablefish in the longline fishery typically consists of a high proportion of sablefish, 90% or more. However at times grenadiers may be a significant catch and they are almost always discarded.

Fishery-specific effects on age-at-maturity and fecundity of the target species:

- The shift from an open access to an IFQ fishery has decreased harvest of immature fish and improved the chance that individual fish will reproduce at least once (Sigler and Lunsford 2001).

Fishery-specific effects on EFH non-living substrate:

- The primary fishery for sablefish is with longline gear. While it is possible that longlines could move small boulders it is unlikely fishing would persist where this would often occur. Relative to trawl gear, a significant effect of longlines on bedrock, cobbles, or sand is unlikely.

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

At the ecosystem scale, mass water movements and temperature changes appear related to recruitment success. Above-average recruitment was somewhat more likely with northerly winter currents and much less likely for years when the drift was southerly. Recruitment was above average in 61% of the years when temperature was above average, but was above average in only 25% of the years when temperature was below average. Growth rate of young-of-the-year sablefish is higher in years when recruitment is above average (Sigler et al. 2001). Shotwell et al. (2012) showed that colder than average wintertime sea surface temperatures in the central North Pacific may represent oceanic conditions that create positive recruitment events for sablefish in their early life history.

Ecosystem modeling. Earlier ecosystem research (NOAA, 2002) developed ECOPATH trophic web models that included sablefish and applied ecosystem modeling for fishery sustainability (NOAA/ AFSC, 2006). These models primarily use a food web approach with dynamic equations describing predator-prey interactions as has used in many other fished marine ecosystems. Other scientists evaluated impacts of climate change on West Coast sablefish. They used models to include environmental variability directly into stock assessments and to demonstrate how it can affect estimation of recruitment parameters, stock status, and conservation benchmarks (Shrippa, et al. 2009).

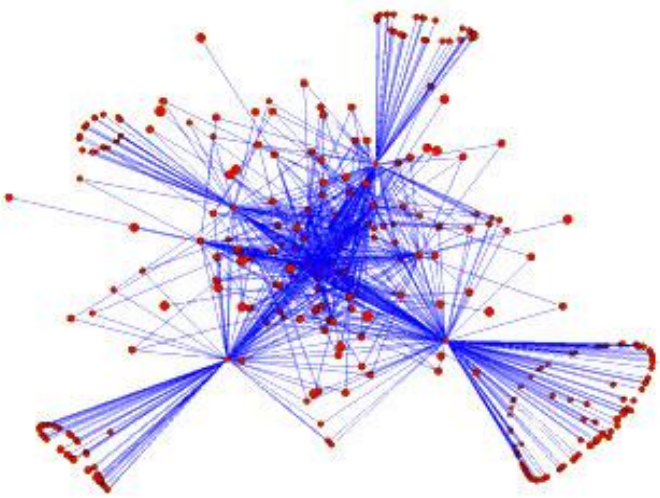


Figure 15. Food web constructed from the GOA food habits database, where each species is a node (dots) and each predator-prey interaction is a link (lines). The four "hubs" apparent in the figure are cod, pollock, halibut, and arrowtooth flounder. (NOAA / AFSC, 2006).
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-130.pdf

Discards

Sablefish discard data by target fisheries are available for hook-and-line and other gear. From 1994 to 2004 discards averaged 1,357 t for the GOA and BSAI combined. Since then, discards have been lower, averaging 626 t between 2006 and 2011. The highest discard amounts occur in hook-and-line fisheries in the GOA (Table 16).

Table 16. Discarded catches of sablefish (amount [t], percent of total catch, total catch [t]) by gear (H&L=hook & line, Other = Pot, trawl, and jig, combined for confidentiality) by FMP area for 2007-2012. Source: NMFS Alaska Regional Office via AKFIN, November 6, 2013.

		BSAI			GOA			Combined		
Year	Gear	Discard	%Discard	Catch	Discard	%Discard	Catch	Discard	%Discard	Catch
2007	Total	70	3.0%	2,322	420	3.3%	12,693	490	3.3%	15,015
	H&L	16	2.3%	679	242	2.1%	11,586	258	2.1%	12,265
	Other	54	3.3%	1,643	178	16.1%	1,107	232	8.4%	2,749
2008	Total	98	4.8%	2,035	810	6.4%	12,591	908	6.2%	14,626
	H&L	92	10.9%	845	737	6.3%	11,727	829	6.6%	12,573
	Other	7	0.5%	1,190	72	8.4%	864	79	3.8%	2,053
2009	Total	26	1.3%	1,986	708	6.4%	10,994	733	5.6%	12,981
	H&L	18	1.5%	1,183	627	6.2%	10,106	645	5.7%	11,289
	Other	8	1.0%	803	81	9.1%	889	89	5.2%	1,692
2010	Total	42	2.3%	1,831	415	4.1%	10,089	457	3.8%	11,920
	H&L	34	2.8%	1,215	368	4.0%	9,188	402	3.9%	10,403
	Other	8	1.3%	616	48	5.3%	901	55	3.7%	1,517
2011	Total	24	1.4%	1,714	691	4.7%	14,580	715	4.4%	16,295
	H&L	16	1.5%	1,077	493	3.7%	13,315	509	3.5%	14,392
	Other	8	1.2%	637	198	15.6%	1,265	206	10.8%	1,902
2012	Total	23	1.2%	1,938	352	3.0%	11,914	375	2.7%	13,852
	H&L	12	1.0%	1,189	287	2.6%	11,054	299	2.4%	12,243
	Other	41	5.5%	749	65	7.6%	860	76	4.7%	1,610
2007-2012	Total	47	2.4%	1,971	566	4.7%	12,144	613	4.3%	14,115
Average	H&L	31	3.0%	1,031	459	4.1%	11,163	490	4.0%	12,194
	Other	21	2.2%	940	107	10.9%	981	123	6.4%	1,921

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

Bycatch

Sablefish discards by target fisheries are available for hook-and-line gear and other gear combined (see above). From 1994 to 2004 discards averaged 1,357 t for the GOA and BSAI combined (Hanselman et al. 2008). Since then, discards have been lower, averaging 626 t between 2006 and 2011. The highest discard amounts occur in hook-and-line fisheries in the GOA.

Table 17 shows the bycatch of the GOA and BSAI Fishery Management Plans' (FMP) species 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 2nd and 3rd most caught species at 366 t/year and 207 t/year. The next 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 18). Other nontarget catches that have totals over a ton per year are corals, snails, sponges, sea stars, and miscellaneous fishes and crabs.

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). 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 19).

Table 17. Bycatch (t) of FMP Groundfish species in the targeted sablefish fishery averaged from 2007-2011. Other = Pot and trawl combined for confidentiality. Other Species is 2007-2010, and Sharks is only 2011. Source: NMFS AKRO Blend/Catch Accounting System via AKFIN, Oct. 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

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

Non-target, Non-FMP bycatch

Table 18. Bycatch of nontarget species and HAPC biota in the targeted sablefish fishery.

	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

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

Prohibited species catches (PSC)

Table 19. 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. Other = Pot and trawl combined because of confidentiality. Source: NMFS AKRO Blend/Catch Accounting System PSCNQ via AKFIN, October 12, 2012.

	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

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIsablefish.pdf

Bycatch in state waters

Alaska manages bycatch in state waters and sets allowable bycatch amounts for key species.

Bycatch Allowances in the NSEI sablefish state fishery

Allowable bycatch percentage indicates the amount of bycatch that may be legally landed on an NSEI sablefish permit, based on the round weight of sablefish and round weight of bycatch species or species group:

Bycatch Species	Allowable Bycatch Amount
Demersal Shelf Rockfish (DSR)	1%
Shortraker and Rougheye rockfish	7% in aggregate
Other rockfish & thornyheads	15% in aggregate
Lingcod	0%
Pacific Cod	20%
Spiny dogfish	35%
Other groundfish	20%

Full-retention and reporting of rockfish, excluding thornyheads, is required for CFEC permit holders fishing for groundfish in NSEI. All rockfish in excess of allowable bycatch limits shall be reported as bycatch overage on an ADFG fish ticket and proceeds from the sale of excess rockfish shall be surrendered to the state [5AAC 28.171(f)]. Pacific cod in excess of bycatch limits described above may be landed on a CFEC miscellaneous finfish (M) permit in areas open to directed Pacific cod fishing. Fishermen with halibut IFQ in regulatory area 2C and a CFEC halibut

permit card must retain all halibut over 32 inches in length, up to the amount of their IFQ.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/431292948.pdf

Bycatch Allowance in the SSEI sablefish state fishery

Allowable bycatch that may be legally landed on an SSEI sablefish permit is as follows based on round weight of both target and bycatch species:

Species	Longline fishery	Pot fishery
Demersal Shelf Rockfish (DSR)	1%	0%
Shortraker & Rougheye Rockfish	7% in aggregate	0%
Other rockfish & thornyheads	15% in aggregate	0%
Lingcod	0%	0%
Pacific Cod	20%	20%
Spiny dogfish	35%	20%
Other groundfish	20%	20%

All permit holders must retain, weigh, and report all rockfish taken in SSEI. This regulation does not apply to shortspine thornyhead. All rockfish in excess of allowable bycatch limits are to be reported as bycatch overage on the fish ticket. Any proceeds from the sale of excess rockfish is to be surrendered to the state. When the directed Pacific cod fishery is open in SSEI, Pacific cod taken in excess of bycatch limits may be landed on the appropriate CFEC miscellaneous finfish permit.
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/390185246.pdf

PWS Sablefish fishery bycatch limits

Bycatch limits by species or species aggregate for the Prince William Sound Management Area state-waters sablefish fishery are set as follows by Emergency Order 2-GF-E-06-14 as round weight of bycatch as a percentage of the round weight of the target species:

(1) may retain 20 percent Pacific cod;

(2) may retain 15 percent skate species in aggregate except;

(A) may not retain big skate after 12:00 noon February 6;

(3) may retain 15 percent shark species in aggregate (includes spiny dogfish);

(4) may not retain lingcod prior to July 1; after July 1 may retain 20 percent lingcod;

(5) may retain 20 percent pollock;

(6) must retain all rockfish (and thornyhead) as required by 5 AAC 28.265 and any rockfish in excess of 20 percent in aggregate must be weighed and reported as bycatch overage on an ADFG fish ticket;

(A) no rockfish landing or combination of landings may exceed the 5-day trip limit of 3,000 pounds

(7) may retain 20 percent other groundfish in aggregate.

Cook Inlet sablefish fishery bycatch allowance

Big skate closed to retention as bycatch in Cook Inlet waters on February 6 by Emergency Order 2-GF-H-03-14. Other bycatch limits by species or species aggregate for the Cook Inlet Management Area are set by Emergency Order 2-GF-H-01-14.

http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/423840827.pdf

Grenadier interactions and management options

Giant grenadiers, make up the bulk of the non target species bycatch, peaking at 9,315 t in 2007, but decreasing since with a 2011 bycatch of 6,652 t. Their catch averages 66% of the total bycatch in the sablefish fishery. Giant grenadier is abundant on the continental slope of Alaska and scientists consider it an extremely important component of the ecosystem in this habitat. The amount of giant grenadier taken as bycatch in this region is substantial. In the GOA in 2010, the estimated catch of giant grenadier of 5,419 tons was exceeded for only five groundfish species: walleye pollock (*Gadus chalcogramma*), Pacific cod (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), Pacific ocean perch (*Sebastes alutus*), and sablefish. Most of the giant grenadier bycatch in the GOA is from the sablefish longline fishery, and nearly all is discarded at sea with a likely mortality rate of 100%.

The Secretary of Commerce approved Amendments 100/91 on August 6th 2014, which added the grenadier complex into both FMPs as Ecosystem Components. Under this rule, they are not allowed to be targeted but there is an 8% Maximum Retainable Allowance (MRA) (Federal Register, Proposed Rules, Vol. 79, No. 93). The final rule will publish before the end of the year and so it may be effective for the start of the 2015 fishing year.

As an Ecosystem Component, a stock assessment is not required and there is no ABC or OFL. A full unofficial assessment report was prepared for grenadiers in even years since 2006, even though they were "non specified". The latest SAFE report contains a time series of catch and abundance estimates and unofficial ABC and OFL values based on Tier 5 calculations. These values are not used for management or for determining if overfishing is occurring for Ecosystem Component species/complexes. There is no definition of overfishing for an Ecosystem Component.

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/GrenadierDiscPaper521.pdf

Table 20. Stock Assessment information for the GOA and BSAI grenadiers in 2014.

	As estimated or specified *last* year for[a]:		As estimated or recommended *this* year for:	
Quantity	2014	2015	2015	2016
M (natural mortality)	0.078	0.078	0.078	0.078
Specified/recommended Tier	5	5	5	5
Biomass (t)	597,884	597,884	524,624	524,624
F_{OFL} (F=M)	0.078	0.078	0.078	0.078
$maxF_{ABC}$ (maximum allowable = 0.75x F_{OFL})	0.0585	0.0585	0.0585	0.0585
F_{ABC}	0.0585	0.0585	0.0585	0.0585
OFL (t)	**46,635**	46,635	**40,921**	40,921
maxABC (t)	34,976	34,976	**30,691**	30,691
ABC (t)	**34,976**	34,976	**30,691**	30,691
Status	As determined *last* year for:		As determined *this* year for:	
	2012	2013	2013	2014
Overfishing	No	n/a	No	n/a

[a]The values for biomass, OFL, and ABC in these two columns are based on Rodgveller and Hulson 2013. They are an average of the last three trawl surveys that sampled down to 1,000 m. The current values (for 2015 and 2016) are from the random effects model fit to survey biomass by region and depth strata.
These are unofficial ABC and OFL values since grenadier are an Ecosystem Component, which do not have ABCs or OFLs.

http://www.afsc.noaa.gov/REFM/Docs/2014/BSAIgrenadier.pdf

Fishery impact on the shark complex

The sablefish fishery catches significant portions of spiny dogfish and other/unidentified shark species. Spiny dogfish (*Squalus suckleyi*) is listed as IUCN Red list "Vulnerable." Fisheries and population trend data indicate that the southern part of the Northeast Pacific stock has also declined through overfishing, but stocks appear stable off Alaska.
http://www.iucnredlist.org/apps/redlist/details/61413/0

There are currently no directed commercial fisheries for shark species in federally or state managed waters of the BSAI and the GOA, and most incidental catch is not retained. Spiny dogfish are allowed as retained incidental catch in some state managed fisheries, and salmon sharks are targeted by some sport fishermen in Alaska state waters. There is no evidence to suggest that over fishing is occurring for any shark species in the BSAI and the GOA because the OFL or ABC has not been exceeded.

Gulf of Alaska shark bycatch.

The shark complex serves as a management unit and it includes spiny dogfish, Pacific sleeper shark, salmon shark and other/unidentified sharks) in the GOA and BSAI. Stock assessments occur on biennial schedules for each region. GOA sharks are a Tier 6 complex, however, the ABC and OFL for spiny dogfish are calculated using a Tier 5 approach with the survey biomass estimates considered a minimum estimate of biomass because the estimates are considered "unreliable" and "likely a minimum biomass" estimate. This approach was adopted by the SSC in 2010. The complex OFL is based on the sum of the Tier 5 and Tier 6 (average historical catch between the years 1997 - 2007) recommendations for the individual species.

Trawl survey data was updated in the Tier 5 calculations for spiny dogfish. The 2013 survey had both a reduced number of stations in all strata and the 700 – 1000 m depth stratum was not sampled. It is unlikely that the skipped depth stratum impacted the spiny dogfish biomass estimate because biomass in that stratum has always been 0 t. The 2013 survey biomass estimate (160,384 t, CV = 40%) is nearly four times greater than the 2011 biomass estimate of 41,093 t (CV = 22%); this variability is typical for spiny dogfish. The 3 – year average biomass from the trawl survey that is used in calculating the ABC and OFL declined from 79,979 t (2007, 2009 and 2011 surveys) to 76,452 t (2009, 2011 and 2013 surveys) with the inclusion of the new survey data. The 2007 survey biomass estimate (161,965 t, CV = 35%) dropped out of the calculations, but because the 2013 estimate was nearly equal to the 2007 estimate, the average had only minimal change.

Substantial changes to the observer program (referred to as "observer restructuring") likely affected the catch estimates for shark species. Smaller vessels are now subject to observer coverage, and this includes vessels fishing halibut IFQ, which were previously exempt from coverage. Due to the government shutdown, there was not sufficient time to fully examine and present the impacts of the restructuring on the shark catches in this assessment. Total shark catch in 2013 was 1,019 t, up from 634 in 2012. This is the highest since 2009, but was still below the maximum historical catch of 1,538 t in 2006 (over the years 2003 – 2012). The increase in 2013 can be attributed mostly to an increase

in the catch estimate of spiny dogfish in the Pacific halibut target fishery, which was 460 t, up ~300 t from the average catch from 2003 – 2012, but was still within the range of catches from this target group. Pacific sleeper shark catch in the halibut target group in 2013 (60 t) was significantly greater than the 2003 - 2012 average (7.4 t, SD = 18.3). An additional impact of observer restructuring was that estimated shark catches in NMFS areas 649 (Prince William Sound) and 659 (Southeast Alaska inside waters) for Pacific sleeper shark and spiny dogfish by the halibut target group in 2013 was 126 t and 52 t, respectively, whereas historically it has been small (<1 t for Pacific sleeper sharks and ~14 t average, SD = 23, for spiny dogfish).

There was approximately 2 t of salmon shark and other shark estimated in these areas as well. The catch in NMFS areas 649 and 659 does not count against the federal TAC, but if it were included the total catch of sharks in 2013 would be 1,199 t, which is still below the recommended ABC for this complex. It is unknown to what extent the restructuring of the observer program in 2013 may have affected catch estimation in these fisheries; future analyses will aim to investigate shifts in observer coverage and the effects on shark catch estimation.

The catch of spiny dogfish in the rockfish target group also increased in 2013, which is likely not related to the observer restructuring. In 2013 the catch of spiny dogfish was 86 t, significantly greater than the historical average. (7 t, SD = 10.2). It is unknown if this increase in catch is due to a change in the fishing activity, a change in spiny dogfish abundance in the area or a factor of a patchily distributed species.

For 2014 the SAFE authors recommended the maximum allowable ABC of 5,989 t and an OFL of 7,986 t for the shark complex in the GOA (see tables below). Catch in 2012 was 634 t and in 2013 was 1,019 t (as of October 24). The complex was not being subjected to overfishing last year. The ABC/OFL for the shark complex is the sum of the computations for the individual species.

Spiny Dogfish Quantity	As estimated or *specified last* year for: 2013	2014	As estimated or *recommended this* year for: 2014	2015
M (natural mortality rate)	0.097	0.097	0.097	0.097
Tier	6*	6	6	6
Biomass (t)				
Upper 95% Confidence Interval	NA	NA	119,277	119,277
Point Estimate	76,979	76,979	76,452	76,452
Lower 95% Confidence Interval	NA	NA	33,628	33,628
F_{OFL}	0.097	0.097	0.097	0.097
$maxF_{ABC}$	0.073	0.073	0.073	0.073
F_{ABC}	0.073	0.073	0.073	0.073
OFL (t)	7,467	7,467	**7,416**	7,416
maxABC (t)	5,600	5,600	5,562	5,562
ABC (t)	5,600	5,600	**5,562**	5,562
Status	As determined *last* year for: 2011	2012	As determined *this* year for: 2012	2013
Overfishing	No	n/a	No	n/a

*While spiny dogfish are a Tier 6 species, a Tier 5 approach is used. They are not a Tier 5 because the trawl survey biomass is not considered reliable for the species.

Pacific sleeper, salmon and other sharks	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2013	2014	2014	2015
Tier	6	6	6	6
OFL (t)	571	571	**571**	571
maxABC (t)	428	428	428	428
ABC (t)	428	428	**428**	428
	As determined *last* year for:		As determined *this* year for:	
Status	2011	2012	2012	2013
Overfishing	No	n/a	No	n/a

Summaries for Plan Team

Species	Year	Biomass[1]	OFL	ABC	TAC	Catch[2]
Shark Complex	2012	76,979	8,037	6,028	6,028	634
	2013	76,979	8,037	6,028	6,028	1,019
	2014	76,452	7,986	5,989		
	2015	76,452	7,986	5,989		

[1]Biomass is the 3 – year average biomass for spiny dogfish only. The survey biomass estimates for the remaining shark species in the complex are not used for ABC and OFL calculations.
[2]Catch as of Oct 24, 2013

http://www.afsc.noaa.gov/REFM/Docs/2013/GOAshark.pdf

BSAI shark bycatch. In the BSAI, the sablefish fishery catches sharks as bycatch. The shark complex (Pacific sleeper shark, spiny dogfish, salmon shark and other/unidentified sharks) in the BSAI is assessed on a biennial stock assessment schedule. BSAI sharks are a Tier 6 complex with the OFL based on maximum historical catch between the years 1997 – 2007 (ABC is 75% of OFL).

For 2014 the SAFE authors recommended the maximum allowable ABC of 1,022 t and an OFL of 1,363 t for the shark complex in the BSAI (see table below). Catch in 2012 was 95 t and in 2013 was 71 t (as of October 24). The stock complex was not subject to overfishing last year, and data do not exist to determine if the species in the complex are overfished.

Shark Complex	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2013	2014	2014	2015
Tier	6	6	6	6
OFL (t)	1,360	1,360	**1,363***	1,363
maxABC (t)	1,020	1,020	1,022	1,022
ABC (t)	1,020	1,020	**1,022**	1,022
	As determined *last* year for:		As determined *this* year for:	
Status	2011	2012	2012	2013
Overfishing	No	n/a	No	n/a

*The small discrepancy between the author recommendations and the specifications is due to the Plan Teams recommending and the SSC accepting the use of a rounded value. These values have not changed since 2010.

Summaries for Plan Team

Species	Year	Biomass[1]	OFL	ABC	TAC	Catch[2]
Shark Complex	2012	Unknown	1,363	1,020	50	95
	2013	Unknown	1,363	1,020	100	71
	2014		1,363	1,020		
	2015		1,363	1,020		

[1]Swept area biomass estimates are calculated for the BSAI surveys, but are not reliable for the shark species. They are not used for ABC/OFL calculations and are not included here.
[2]Catch as of Oct 24, 2013

http://www.afsc.noaa.gov/REFM/Docs/2013/BSAIshark.pdf

Seabirds

Of all the seabird interactions in the Alaska EEZ, NMFS is particularly interested in albatross bycatch because some species face serious conservation concerns. The short-tailed albatross (*Phoebastria albatrus*) is listed as endangered under the Endangered Species Act (ESA) and has been documented taken in the Alaska demersal longline fisheries. Two other non-ESA listed albatross species also inhabit Alaska waters and have been taken in the Alaska groundfish longline fisheries: the black-footed albatross (*P. nigripes*) and Laysan albatross (*P. immutabilis*). Laysan albatross have also been taken in trawl fisheries in Alaska. Black-footed and Laysan albatross breed in the northwestern Hawaiian Islands and travel to the BSAI and GOA to forage in offshore waters.

Endangered Species Act Incidental Take Statements

As a result of Endangered Species Act (ESA) Section 7 consultations, U.S. Fish & Wildlife Service (USFWS) issued incidental take statements as follows:

• Four short-tailed albatross during each two-year period for the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) hook-and-line groundfish fisheries.

• Two short-tailed albatross during each two-year period for the commercial halibut longline fishery off the coast of Alaska.

• Two short-tailed albatross in trawl fisheries managed by NMFS in the BSAI and GOA during the period that the current Biological Opinion remains in effect.

If incidental take is exceeded, consultation with the USFWS must be reinitiated. In response to listing short-tailed albatross under the ESA, NMFS implemented regulations in 1996 to require use of bird avoidance (or scaring) gear on sablefish hook-and-line fishing vessels. In 2008 NMFS revised the rule with less restrictive requirements on smaller vessels between 26 to 55 feet long. Current regulations require bird avoidance gear (or scaring line) on some vessels operating in certain areas. These measures include the use of streamer (tory) lines and buoy bags depending on area and size of the vessel. Other avoidance measures may include night settings, using a line shooter and lining tubes. These measures have been shown to reduce seabird interactions when setting or retrieving gear. The trend in seabird catch decreased significantly with the 1996 regulations and appears to be decreasing further, presumably due to widespread use of these measures to reduce bycatch.
http://alaskafisheries.noaa.gov/protectedresources/seabirds/guide.htm

Status and trends

The 2012 estimated numbers for the combined groundfish fisheries (Table below) are 40% below the running 5-year average for 2007-2011 of 8,295 birds. Albatross bycatch was reduced in 2012 by 27% compared to the previous 5 years, with the greatest decrease in Laysan (*Phoebastria immutabilis*; 36% reduction) versus black-footed albatross (*P. nigripes*; 11% decline). Northern fulmar (*Fulmaris glacialis*) bycatch remained the highest proportion in the catch at 61%, but was down by 39% compared to the 5-year average and 52% from the year before. Fulmar bycatch has ranged between 45 to 76% of the total seabird bycatch since 2007. Average annual mortality for fulmars since 2007 has been 4,586. However, when compared to estimates of total population size in Alaska of 1.4 million (Denlinger, 2006), this represents an annual 0.33% mortality due to fisheries. However, there is some concern that the mortality could be colony-specific possibly leading to local depletions (Hatch et al., 2010). The demersal longline fishery in Alaska typically drives the overall estimated bycatch trends (but see comment regarding trawl estimates below). Bycatch in the longline fishery showed a marked decline beginning in 2002 due to the deployment of streamer lines as bird deterrents. Since then, annual bycatch has remained below 10,000 birds, dropping as low as 3,704 in 2010. Numbers increased to 8,914 in 2011, the second highest in the streamer line era, but fell back to 4,544 in 2012. The increased numbers in 2011 were due to a doubling of the gull (*Larus spp*) numbers (1,084 to 2,206) and a 3-fold increase in fulmars, from 1,782 to 5,848. These species group numbers have decreased in 2012 as well, to 885 and 3,016 respectively.

Albatross bycatch varied annually. The greatest numbers of albatross were caught in 2008. In 2012, 57.0% of albatross bycatch occurred in the GOA (down from 87% in 2011). The GOA typically accounts for 10 to 20% of overall seabird bycatch. Only Laysan albatross were taken in the BSAI; all black-footed albatross were taken in the GOA (along with about 14 Laysan). While the estimated bycatch of black-footed albatross underwent a 4-fold increase in bycatch (44 to 206) between 2010 and 2011, the 2012 estimates are about 11% under the long-term average of 153 birds per year. Although the black-footed albatross is not endangered (unlike its relative, the short-tailed albatross), it is considered a Bird of Conservation Concern by the U.S. Fish & Wildlife Service. This designation means that without additional conservation actions, these birds of concern are likely to become candidates for listing under the Endangered Species Act.

Of special interest is the endangered short-tailed albatross (*Phoebastria albatrus*). Since 2003, bycatch estimates were above zero only in 2010 and 2011, when 2 birds and 1 bird were incidentally hooked respectively, resulting in estimated takes of 15 and 5 birds. This incidental take occurred in the Bering Sea area. No observed takes occurred in 2012. The expected incidental take, 4 birds every two years since the Biological Opinion was revised in 2003, totals to 20 observed takes while realized observed take has been 3 birds.
http://www.afsc.noaa.gov/REFM/Docs/2013/ecosystem.pdf

The NMFS confirmed the take of a second endangered short-tailed albatross (STAL) in the hook-and-line groundfish fishery of the Bering Sea/Aleutian Islands Management Area (BSAI). On September 16, 2014, NMFS reported the verified take of a STAL and the take of a second unidentified albatross in the same haul. US Fish & Wildlife Service seabird experts, Washington Sea Grant, and NMFS

interviewed the observer, reviewed all available information of the incident, and concluded that the previously unidentified bird was also a short-tailed albatross. The birds were taken on September 7, 2014 at 58°47" 54' N and 177°43" 36' W in NMFS reporting area 521. The last three documented STAL takes in Alaska were in August 2010, September 2010, and October 2011. This is the second take in the two-year period that began on September 16, 2013. To date, the incidental take levels have not been reached during the current or any previous Biological Opinions.
http://alaskafisheries.noaa.gov/cm/info_bulletins/bulletin.aspx?bulletin_id=9677

The longline fleet has traditionally been responsible for about 91% of the overall seabird bycatch in Alaska, as determined from the data sources noted above. However, standard observer sampling methods on trawl vessels do not account for additional mortalities from net entanglements, cable strikes, and other sources. Thus, the trawl estimates are biased low (Fitzgerald et al., in prep). For example, the 2010 estimate of trawl-related seabird mortality is 823, while the additional observed mortalities (not included in this estimate and not expanded to the fleet) were 112. Observers now record the additional mortalities they see on trawl vessels and the AFSC Seabird Program is seeking funds to support an analyst to work on how these additional numbers can be folded into an overall estimate. The challenge to further reduce seabird bycatch is great given the rare nature of the event. For example, Dietrich and Fitzgerald (2010) found in an analysis of 35,270 longline sets from 2004 to 2007 that the most predominant species, northern fulmar, only occurred in 2.5 of all sets. Albatross, a focal species for conservation efforts, occurred in less than 0.1 of sets. However, given the vast size of the fishery, the total bycatch can add up to hundreds of albatross or thousands of fulmars.

Table 21. Total estimated seabird bycatch in Alaskan groundfish fisheries, all gear types and Fishery Management Plan areas combined, 2007 through 2012. Note that these numbers represent extrapolations from observed bycatch, not direct observations. See text for estimation methods.

Species/Species Group	2007	2008	2009	2010	2011	2012
Unidentified Albatross	16	0	0	0	0	0
Short-tailed Albatross	0	0	0	15	5	0
Laysan Albatross	17	420	114	267	189	128
Black-footed Albatross	176	290	52	44	206	136
Northern Fulmar	4,581	3,426	7,921	2,357	6,214	3,016
Shearwater	3,602	1,214	622	647	199	510
Storm Petrel	1	44	0	0	0	0
Gull	1,309	1,472	1,296	1,141	2,208	885
Kittiwake	10	0	16	0	6	5
Murre	7	5	13	102	14	6
Puffin	0	0	0	5	0	0
Auklet	0	3	0	0	0	7
Other Alcid	0	0	105	0	0	0
Other Bird	0	0	136	0	0	0
Unidentified	509	40	166	18	259	284
Total	10,228	6,914	10,441	4,596	9,298	4,997

http://www.afsc.noaa.gov/REFM/Docs/2013/ecosystem.pdf

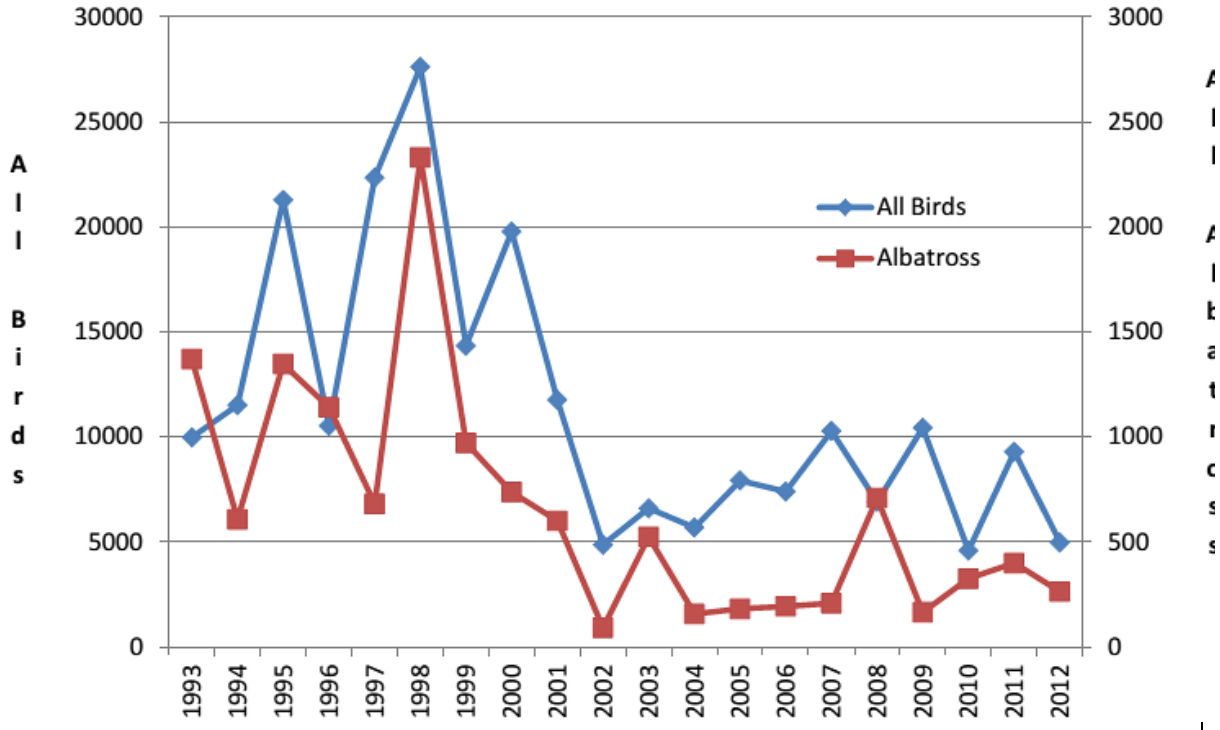


Figure 16. Seabird bycatch in Alaskan groundfish fisheries, all gear types combined, 1993 to 2012. Total estimated bird numbers are shown in the left-hand axis while estimated albatross numbers are shown in the right-hand axis.

Interactions with whales

Sperm whales and killer whales interact with commercial fisheries harvests, mostly by taking fish off of harvest gears. Sperm whales consume primarily squid and fish but they have been observed feeding off longline gear in sablefish and halibut fisheries in the GOA. The interactions with commercial longline gear do not appear to have an adverse impact on these whales. Much to the contrary, the whales appear to have become more attracted to these vessels in recent years. The Southeast Alaska Sperm Whale Avoidance Project (SEASWAP) in collaboration with the AFSC is deploying acoustic receivers on the longline survey to count the number of times a sperm whale creaks (makes a squeaking sound) which may be an indication of a depredation event. This method of quantifying depredation can also be used to compare survey depredation rates to fishery rates. SEASWAP is also doing some work on deterrents.

Killer whale depredation and mortality

Killer whales frequently take fish directly from commercial fishing gear as it is retrieved. Interactions with commercial longline fisheries are well-documented throughout the GOA and BSAI. Depredation rates of bottom fish by killer whales on longline catches, based on four different methods of calculation, suggested that whales took 14 to 60 percent of the sablefish, 39 to 69 percent of the Greenland turbot, and 6 to 42 percent of the arrowtooth flounder caught in commercial gear (Yano and Dahlheim 1995). Depredation rates can be so high in some areas that fishermen have abandoned particular fisheries even when they are still open. Killer whales fall under the jurisdiction

of the NOAA Fisheries PRD, and are protected under the Marine Mammal Protection Act (MMPA) of 1972. In addition, there are many reports of killer whales consuming the processing waste of Bering Sea groundfish trawl fishing vessels.

Sablefish data gaps and research priorities

There is little information on early life history of sablefish and recruitment processes. A better understanding of juvenile distribution, habitat utilization, and species interactions would improve understanding of the processes that determine the productivity of the stock. Better estimation of recruitment and year class strength would improve assessment and management of the sablefish population.

Future sablefish research is going to focus on several directions:

1) Refine survey abundance index model for inclusion in the 2014 assessment model that accounts for whale depredation and potentially includes gully abundance data and other covariates.

2) Refine fishery abundance index to utilize a core fleet, and identify covariates that affect catch rates.

3) Improve knowledge of sperm whale and killer whale depredation in the fishery and begin to quantify depredation effects on fishery catch rates.

4) Continue to explore the use of environmental data to aid in determining recruitment.

5) An integrated GOA Ecosystem project funded by the North Pacific Research Board is underway and is looking at recruitment processes of major groundfish including sablefish. The hope is to work closely with this project to help understand sablefish recruitment dynamics.

6) The SAFE Authors hope to develop a spatially explicit research assessment model that includes movement, which will help in examining smaller-scale population dynamics while retaining a single stock hypothesis Alaska-wide sablefish model. This is to include management strategy evaluations of apportionment strategies.

http://www.afsc.noaa.gov/REFM/docs/2013/GOAsablefish.pdf

Clause 14 "where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity" is not relevant to this fishery.

8. Performance specific to agreed corrective action plans

Not Applicable. This is the 3rd FAO RFM US Alaska sablefish surveillance assessment report (Eve - October 2014). No non conformances were issued during full assessment. However, a number of issues were identified for review during surveillance to identify whether management actions were being taken to improve issues relating to bycatch in the sablefish fleet and the restructuring of the observer program. The developments have been positive and proceeded as planned. The newly restructured observer program began deployments in January of 2013.

Clause		Summary of Surveillance Actions Proposed
4.2	**An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.**	**The Restructured Observer Program has been formally implemented. The next surveillance will verify the continuous implementation/development of the program, the data produced from it (e.g. bycatch and discards), and the resulting management actions.**

9. Unclosed, new non conformances and new corrective action plans

Not applicable, no new non conformances have been issued.

10.Future Surveillance Actions

The assessment team will review the following during the 2015 surveillance assessment: 1) Review of potential re-instatement of the Alaska Coastal Management Plan and 2) Developments, coverage and data produced by the restructured observer program. For this surveillance these areas have all been addressed under the respective sections of this report.

11.Client signed acceptance of the action plan

Not applicable.

12.Recommendation and Determination

Following this 3rd surveillance assessment, finalized in December 2014, the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the US Alaska sablefish federal and state commercial fisheries, under federal (National Marine Fisheries Service/North Pacific Fishery Management Council) and state (Alaska Department of Fish and Game/Board Of Fisheries) management, fished with benthic longline, pot and trawl gear (within Alaska's 200 nm EEZ).

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Appendix 1

Assessment Team Details

Alan Sinclair (Assessor)

Alan Sinclair recently retired from a fisheries research career with Fisheries and Oceans Canada. His research included stock assessment methods and application with a recent emphasis on management strategy evaluation through feedback loop simulation and the application of the Precautionary Approach in achieving sustainable fisheries. He studied changes in fish population demographic characteristics including growth, juvenile survival, and adult natural mortality and the implications of these changes on productivity and management reference points. He investigated geologic and oceanographic factors influencing the spatial distribution of fish species, and the influence of environmental factors on recruitment. He worked with a number of national and international fisheries organizations including the Pacific Scientific Advice Review Committee (PSARC) chair of Groundfish Subcommittee; Canadian Atlantic Fisheries Advisory Committee (CAFSAC) chaired the Groundfish Subcommittee, the Statistics Sampling and Surveys Subcommittee; NAFO stock assessments and symposia; ICES annual science conferences, symposia and working groups; PICES annual science conference. He participated in fishery stock assessment meetings as reviewer and presenter in PSARC, CAFSAC, NAFO, ICES, and US National Marine Fisheries Service (NMFS) Stock Assessment Review (STAR) Panels.

Dr. Geraldine Criquet (Assessor)

Géraldine Criquet holds a PhD in Marine Ecology (École Pratique des Hautes Études, France) which focused on coral reef fisheries management, Marine Protected Areas and fish ecology. She has also been involved during 2 years in stock assessments of pelagic resources in the Biscay Gulf, collaborating with IFREMER. She worked 2 years for the Institut de Recherche pour le Développement (IRD) at Reunion Island for studying fish target species growth and connectivity between fish populations in the Indian Ocean using otolith analysis. She served as Consultant for FAO on a Mediterranean Fisheries Program (COPEMED) and developed and implemented during 2 years a monitoring program of catches and fishing effort in the Marine Natural Reserve of Cerbere-Banyuls (France). Geraldine has joined Global Trust Certification in August 2012 as a Fisheries Assessment Officer and is involved in FAO RFM and MSC fisheries assessments.

Vito Ciccia Romito (Lead Assessor)

Vito Ciccia Romito is Italian and holds a BSc in Ecology and a MSc in Tropical Coastal Management from Newcastle University in the U.K. After his BSc, he worked in Tanzania as a Marine Research officer at the Mafia Island Marine Park carrying out biodiversity assessments and monitoring studies of coral reef, mangrove and seagrass ecosystems. Subsequently, for his MSc, he worked on fisheries assessment techniques, ecological dynamics of overexploited tropical marine ecosystems, and evaluation of low trophic aquaculture as a support to artisanal reef fisheries. Over the last 5 years he has been fully involved through Global Trust with the FAO-based RFM Assessment and Certification program covering the Alaska commercial salmon, halibut, sablefish, pollock, crab, cod and flatfish

fisheries as well as the Icelandic cod, saithe, haddock and redfish fisheries. Vito has also participated in IFFO fisheries assessments for anchovy and sardine stocks in both Chile and Peru, and other pre-assessment work in Canada and the Gulf of Mexico. Vito is also lead, third party IRCA approved auditor.