Alaska Responsible Fishery Management Certification

1st Surveillance Report

For The

Alaska Pacific Sablefish (Black cod) Commercial Fishery (200nm EEZ)

Client

'Eat on the Wild Side' (FVOA)

Facilitated By

Alaska Seafood Marketing Institute (ASMI)

Assessors: **Ivan Mateo, Lead Assessor**
Rohan Smith, Assessor
Vito Romito, Assessment Team Support

Report Code: **AK/SAB/002.1/2017**
Published Date: **03rd August 2017**

SAI Global
3rd Floor, Block 3,
Quayside Business Park,
Mill Street, Dundalk,
Co. Louth, Ireland.
T + 353 42 932 0912
F + 353 42 938 6864
www.saiglobal.com

GlobalTRUST
DELIVERING CERTAINTY

Foreword

This report is the 1st Surveillance Report for the Alaska sablefish federal and state commercial fisheries following initial certification award against this FAO-Based RFM Program, awarded on October 11th 2011, and recertification on 9th January 2017.

The objective of the Surveillance Assessment and Report is to monitor for any changes/updates in the management regime, regulations and their implementation since the previous assessment; in this case, the Final Report of Full Assessment (re-certification) completed in January 2017. The report determines whether these changes and current practices remain consistent with the overall scorings of the fishery allocated during re-certification.

High conformance was demonstrated by the fishery with regards to the Fundamental Clause. No corrective action plans with regards non-conformances were identified.

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) and 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 Alaska FAO – Based RFM Conformance Criteria Version 1.2 fundamental clauses as the assessment framework.

Table of contents

Glossary

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
ASMI	Alaska Seafood Marketing Institute
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CCRF	Code of Conduct for Responsible Fisheries
CDQ	Community Development Quota
CFEC	Commercial Fisheries Entry Commission
CPUE	Catch per Unit Effort
EIS	Environmental Impact Statement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FAO	Food and Agriculture Organization of the United Nations
FMP	Fishery Management Plan
GOA	Gulf of Alaska
GHL	Guideline Harvest Level
IFQ	Individual Fishing Quota
IRFA	Initial Regulatory Flexibility Analysis
IRIU	Improved Retention/Improved Utilization
LLP	License Limitation Program
MSFCMA	Magnuson-Stevens Fisheries Management and Conservation Act
mt	Metric tons
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
OFL	Overfishing Level
OLE	Office for Law Enforcement
OY	Optimum Yield
PSC	Prohibited Species Catch
RACE	Resource Assessment and Conservation Engineering
REFM	Resource Ecology and Fisheries Management
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation (Report)
SSC	Scientific and Statistical Committee
SSL	Steller Sea Lion
TAC	Total Allowable Catch
USCG	U.S. Coast Guard

Summary and Recommendations

This report is the **1st Surveillance Report (AK/SAB/002.1/2017)** for the Alaska Pacific Sablefish (Black cod; *Anoplopoma fimbria*) Commercial Fishery produced on behalf of the "Eat on the Wild Side (Fishing Vessel Owners' Association (FVOA))" according to the Alaska Based Responsible Fisheries Management (RFM) Certification Program. The fisheries were originally certified in October 2011, and recertified in 9th January 2017.

The objective of this Surveillance Report is to monitor for, and evaluate the impacts of, any changes to the management regime, regulations and their implementation since the previous assessment. Having assessed these changes to the fishery (if any) the Assessment Team determines if these changes materially affect the fisheries' conformance to the AKRFM Standard and whether current practices remain consistent with the overall confidence ratings assigned during either initial certification or subsequent surveillance audits where the original confidence rating(s) have been changed.

In addition to this, any areas reported as "items for surveillance" or corrective action plans in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. No non-conformances were identified since certification was granted.

The certification covers the Alaskan sablefish (*Anoplopoma fimbria*) commercial fishery legally 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 procedures for Alaska Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria (v1.3) 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. Details of the assessment team are provided in Appendix 1.

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

Assessment Team Details

Dr. Ivan Mateo, Lead Assessor
SAI Global/Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
Email: ivan.mateo@saiglobal.com

Rohan Smith, Assessor
SAI Global/Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
Email: rohan.smith@saiglobal.com

Vito Romito, Assessment Team Support
Independent Fishery Expert
Portlaoise, Co. Laois, Ireland

Ruth O'Connell, Program Administrator
SAI Global/Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
Email: ruth.o'connell@saiglobal.com

1. Introduction

This Surveillance Report documents the 1st Surveillance Assessment of the Alaska Pacific Sablefish (Black cod) Commercial Fishery (200nm EEZ) originally certified on 11th October 2011, and recertified 9th January 2017, and presents the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

Unit of Certification

The Alaska Pacific Sablefish (Black cod) Commercial Fishery (200nm EEZ) legally 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) and Board of Fisheries (BOF)] management, underwent their 1st surveillance assessment against the requirements of the Alaska FAO-Based RFM Conformance Criteria Version 1.3 Fundamental clauses.

This Surveillance Report documents the assessment results for the continued certification of commercially exploited Alaska Pacific Sablefish (Black cod) fisheries to the Alaska RFM Certification Program. This is a voluntary program that has been supported by ASMI who wish to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed.

The assessment was conducted according to the Global Trust procedures for Alaska RFM Certification using the fundamental clauses of the Alaska RFM Conformance Criteria Version (v1.3) May 2016) in accordance with ISO 17065 accredited certification procedures.

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-labelling of products from marine capture fisheries (2009); including:

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 12 fundamental clauses (+ 1 in case of enhanced fisheries) that guide the FAO-Based RFM Certification Program surveillance assessment.

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

1.1. Recommendation of the Assessment Team

Following this 1st Surveillance Report in August 2017 the assessment team recommends that continued Certification under the Alaska 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) and Board of Fisheries (BOF)] management.

2. Fishery Applicant Details

Applicant Contact Information			
Organization/Company Name:	Eat on the Wild Side (Fishing Vessel Owners' Association (FVOA))	**Date:**	26th June 2017
Correspondence Address:	Eat on the Wild Side (Fishing Vessel Owners' Association (FVOA)		
Street :	4005 - 20th Ave. West, Room 232		
City :	Seattle		
State:	Washington 98199		
Country:	USA		
Phone:	(206) 283-7735		
Fax:	N/A		
Key Management Contact Information			
Full Name:	Robert	Alverson	
Position:	Manager		
Correspondence Address:	As above		
Phone:	As above		
E-mail Address:	robertalverson@msn.com		

3. Unit of Certification

U.S. ALASKA SABLEFISH (Black Cod) COMMERCIAL FISHERIES			
Species	**Geographic Region(s)**	**Gear Types**	**Management Authority**
Common name Sablefish (Blackcod) (*Anoplopoma fimbria*)	Federal and state fisheries in the Gulf of Alaska and Bering Sea and 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) and Board of Fisheries (BOF).

4. Surveillance Meetings

Meetings have not been held, this was a desktop review of public available information on the fishery. The documents used to compile the report are referenced in section 13.

5. Assessment Outcome Summary

5.1. Fundamental Clauses Summaries

Fundamental Clause 1: Structured and legally mandated management system

Evidence adequacy rating: High

No significant change has occurred in the principles of management for sablefish in Alaska since 2014. 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. However, changes in management methods, included the 2016 trial deployment of Electronic Monitoring program, as well as planning for further deployments ion 2018.

Fundamental Clause 2: Coastal area management frameworks

Evidence adequacy rating: High

No significant change has occurred since the full assessment final report in January 2017. An appropriate policy, legal and institutional framework is adopted in order to achieve sustainable and integrated use of living marine resources, taking into account the fragility of coastal ecosystems, the finite nature of their natural resources and the needs of coastal communities. These include decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. Both the NPFMC and the Alaska BOF decision making processes are open to public input and consultation and the information produced through these fora, for the management of sablefish in Alaska, are publically available. The NMFS, NPFMC and ADFG cooperatively manage the sablefish fisheries in federal and state waters within the Alaskan EEZ. The NMFS and NPFMC as federal agencies participate in coastal area management-related institutional frameworks through federal National Environmental Policy Act (NEPA) process. NEPA documents are require to be produced each time regulations are renewed or amended meaning all proposed regulations include NEPA considerations. The NEPA process requires information to be made publically available and provides a robust opportunity for public involvement and ensures decisions are made in collaboration with fishery managers, fishermen, fishing organizations and fishing communities.

Fundamental Clause 3: Management objectives and plan

Evidence adequacy rating: High

No significant change has occurred since the full assessment final report in January 2017. The NPFMC is bound by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) which is the primary domestic legislation governing management of marine fisheries in U.S. waters. The MSA sets out and supports implementation of ten National Standards Guidelines for fishery conservation and management, which specifies long-term objectives for U.S. fisheries and establishes a formal set of processes for the setting of short-term objectives and management measures aimed at achieving those long-term objectives. 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 and 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.

Fundamental Clause 4: Fishery data
Evidence adequacy rating: High
No significant change has occurred in the principles and methods with regards to the monitoring and management of fishery removals and mortality of the target stock, since the full assessment final report in January 2017. 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 time series of collections. All fishery removals and mortality of sablefish are considered in the assessment and management of the stock. Reliable and accurate data are provided annually to assess the status of sablefish fisheries and ecosystems. These data including information on retained catch in the directed longline and pot fisheries, by-catch in trawl fisheries, and catches in the Alaskan state-managed fisheries (inside 3 n. mi.), including subsistence fisheries. Several data reporting systems are in place to ensure timely and accurate collection and reporting of catch data.

Fundamental Clause 5: Stock assessment
Evidence adequacy rating: High
No significant change has occurred in the purpose and methods with regards to the monitoring, assessment and management of fishery removals and mortality of the target stock, since the full assessment final report in January 2017. 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. Appropriate research is conducted for the management of sablefish in Alaska waters. The NMFS and ADFG conduct assessment surveys on sablefish in Alaskan waters. The NMFS conducts an annual longline survey and a biennial trawl survey in the Gulf of Alaska and the Aleutian Islands (alternating years between the two regions), and an annual trawl survey in the Eastern Bering Sea and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of catch per unit effort, relative abundance, and biological data. Tagging studies continues to assess sablefish movement for federal, state, and Canadian waters. The ADFG continue to conducts annual tagging survey in Chatham Strait as part of a mark-recapture study to estimate population abundance. Investigations into the migration of sablefish are being conducted in Alaska. The NMFS is working on a migration model that includes both federal and state waters. In addition, the ADFG is conducting pilot studies to determine the feasibility of acoustic tagging of sablefish in Chatham Strait; and research is being conducted on sperm whale interactions (depredation) with the sablefish longline fisheries. Guideline Harvest Level (GHL) and yield-per-unit-area models are being used to manage fishery removals.

Fundamental Clause 6: Biological reference points and harvest control rule
Evidence adequacy rating: High
No significant change has occurred since the full assessment final report in January 2017. The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. A Tier system is established and specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Limit (OFL) for each stock in the complex (usually individual

species but sometimes species groups). In 2016, members at the Center for Independent Experts (CIE) review a number of recommendations to improve aspects of the fishery biological reference model. The 2016 SAFE Report presented the reference model and seven alternatives that sequentially address some of the key recommendations made by the panel. The first two of these alternatives were considered to be minor model changes (incorporating the area sizes and variance estimates for the domestic longline survey). The next three incorporated corrections of the domestic longline survey and longline fishery for whale depredation, which was considered to be a benchmark change that was recommended by the CIE. The final two models address the CIE panel's concern that the model provided "overly precise" estimates of management quantities.

Fundamental Clause 7: Precautionary approach
Evidence adequacy rating: High
No significant change has occurred since the full assessment final report in January 2017. 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. National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. Harvest specifications are made annually by NPFMC, and include the overfishing limit, acceptable biological catch (ABC), and total allowable catch (TAC).

Fundamental Clause 8: Management measures
Evidence adequacy rating: High
No significant change has occurred in the principles and methods with regards to the monitoring and management of fishery removals and mortality of the target stock, since the full assessment final report in January 2017. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary domestic legislation governing management of US marine fisheries. The act establishes MSY as the basis for fishery management and requires that: the fishing mortality rate does not jeopardize the capacity of a stock or stock complex to produce MSY; the abundance of an overfished stock or stock complex is rebuilt to a level that is capable of producing MSY; and OY not exceed MSY. NPFMC, FMPs for GOA and BSAI Regions 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 approach used by NPFMC for sablefish includes the best scientific advice available, and decisions are based on a precautionary approach which includes harvest control rules. In state waters (0-3 nm), five sablefish state fisheries are managed by the ADFG and the BOF outside the IFQ program. Guideline Harvest Level (GHL) and yield-per-unit-area models are being used to manage fishery removals.

Fundamental Clause 9: Appropriate standards of fisher's competence
Evidence adequacy rating: High
No significant changes has occurred in the management of sablefish fishery in Alaska since the full assessment final report in January 2017. Any aspirant sablefish and halibut fisherman must have 150 days of halibut/sablefish fishing experience before being able to purchase halibut IFQs under NMFS/NOAA rules. Obtaining sablefish IFQ share most often will require the purchaser (aspirant sablefish fisherman) 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. The State of Alaska, Department of Labor and Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training and 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 crewmembers for employment in the Alaskan maritime industry. 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.

Fundamental Clause 10: Effective legal and administrative framework
Evidence adequacy rating: High
No significant changes has occurred in the management of sablefish fishery in Alaska since the full assessment final report in January 2017. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The Alaska Wildlife Troopers enforce sablefish fisheries regulations in state waters. All landings of sablefish must be reported to NMFS via its mandatory "e-landings" reporting system. OLE and USCG are responsible for enforcement of regulations in the IFQ fisheries. OLE is responsible for shoreside enforcement and provides after hours surveillance while USCG engages in at-sea enforcement. The USCG documents at-sea violations and refers them to OLE for final action. OLE employs a multifaceted strategy to maximize compliance in the IFQ fisheries. This strategy includes educational outreach, partnerships, patrols, inspections, and investigations. OLE spends thousands of hours annually providing marine resource users with compliance assistance, including staffing booths at organized events, daily contacts in communities, ports, harbors, and at-sea to ensure that the most current and accurate regulatory information is widely distributed and understood.

Fundamental Clause 11: Framework for sanctions
Evidence adequacy rating: High
No significant changes has occurred in the management of sablefish fishery in Alaska since the full assessment final report in January 2017. The MSA is the overarching legislation and regulation for groundfish (and sablefish) fisheries in Alaska. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The Alaska Wildlife Troopers enforce halibut regulations in state waters. The 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. Violations are addressed in four basic enforcement approaches: 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. Penalties under the Halibut Act are outlined based on the gravity of the offense with consequential actions are set out in 6 different tiers.

Fundamental Clause 12: Impacts of the fishery on the ecosystem
Evidence adequacy rating: High
No significant change has occurred in the purpose and methods with regards to the monitoring, assessment and management of fishery removals and mortality of the target stock and ecosystem impacts, since the full assessment final report in January 2017. 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. Research related to fishery impacts on ecosystems and habitats and how environmental factors affect the fishery are routinely conducted with findings and conclusions published in the Ecosystem section of the SAFE document, and annual Ecosystem Considerations document. 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.

Prey population trend for the young-of-the-year alternate between copepods and euphausiids. Juvenile and adult sablefish feed opportunistically, throughout their range on shrimps, cephalopods, and other small fish. Main predator on juvenile sablefish are adult coho and chinook salmon, which prey on young-of-the-year, while sperm whales are main predator on adults. 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. Observer and catch reporting systems are established to monitor interactions and guide any interventions. In addition designated Marine Protected Areas are established and compliance is demonstrated in the fishery.

Fundamental Clause 13: Fisheries enhancement activities (where applicable) N/A
Evidence adequacy rating: N/A

6. Conformity Statement

The Assessment Team recommends that continued certification under the Alaska 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), and Board of Fisheries (BOF)] management.

7. Evaluation of Fundamental Clauses

7.1. Section A. The Fisheries Management System

7.1.1. Fundamental Clause 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.

Number of Supporting clauses	**13**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full conformance
Non Conformances	N/A

Summarized evidence:

1.1. There shall be an effective legal and administrative framework established at local and national level appropriate for the fishery resource and conservation and management.

Evidence

No significant change has occurred in the management of the sablefish fishery in Alaska since the full assessment final report in January 2017. Fisheries for sablefish in Alaska are both federally and state managed. In general, groundfish fisheries in the U.S. Exclusive Economic Zone (EEZ; 3 – 200 nm offshore) fall under federal authority, whereas the State of Alaska manages groundfish fishery resources within state territorial (0 – 3 nm) waters.

In federal waters, the Alaska sablefish fishery is managed through the North Pacific Fishery Management Council (NPFMC)'s Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMPs), subject to Magnuson Stevens Act (MSA) and corresponding federal regulations. The Council may amend the sablefish individual fishing quota (IFQ) Program through amendments to the Gulf of Alaska and Bering Sea and Aleutian Islands Groundfish FMPs, as well as connected or independent federal regulations. Such amendments must be approved by the Secretary before they can be implemented by North Pacific Management Council (NMFS[1]). A stock assessment is performed annually for the federal fishery using an age-structured model; this assessment is reviewed by the North Pacific Management Council.

State sablefish fisheries (i.e. those occurring between 0 and 3 nm offshore) are managed by Alaska Department of Fish and Game (ADFG) and the Alaska Board of Fisheries (BOF[2]). State sablefish fisheries occur in Southeast Alaska, Prince William Sound, Cook Inlet, and in the Aleutian Islands. The majority of sablefish fisheries in Alaska are limited entry and are managed through quota shares[3].

2017 Updates Relative to Sablefish

[1] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
[2] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
[3] http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management

Electronic Monitoring

The Council reviewed the Electronic Monitoring (EM) Workgroup report from their March 2017 meeting. In addition to discussing how the 2017 program is working, a workplan for giving public input on the statement of work for an EM contract, and planning for the transition of the current EM pre-implementation program to an integrated Observer Program, the Workgroup also reviewed the EM Integration action as well as proposed rules and the scope of the 2018 EM deployment pool. The Council motion addressed two areas:

- The Council requested that the agency develop an EM program for 2018 that is generally similar to EM deployment in 2017, except that the Council supports expanding the size of the EM pool in 2018 to accommodate up to 120 longline vessels and up to 45 pot vessels, provided there is funding to support this pool size.
- The Council directed staff to submit comments to the agency on behalf of the Council on the EM Integration Proposed Rule, in line with the six areas highlighted by the consensus of the EM Workgroup (**https://www.npfmc.org/electronic-monitoring-2/).**

1.2. Management measures shall take into account the whole stock unit over its entire area of stock distribution.

Evidence

Sablefish inhabit the northern Pacific Ocean in an arc extending from northern Mexico in the east to northern Japan in the west, with highest concentrations and the majority of catches occurring in Alaskan waters[4]. With regards to eastern North Pacific sablefish, stock assessment scientists have long felt that they form two populations based on differences in growth rate, size at maturity, and tagging studies (McDevitt 1990, Saunders et al. 1996, Kimura et al. 1998, cited in Hanselman et al 2006); a northern population inhabiting Alaska and northern British Columbia (BC) waters and a southern population inhabits southern BC, Washington, Oregon, and California waters, with mixing of the two populations occurring off southwest Vancouver Island and northwest Washington.

However, recent studies have suggested that, primarily due to their migratory nature, sablefish may in fact form one biological population. According to Hanselman et al. (2015) the similarly low current abundances of Alaskan sablefish and sablefish further south is of concern and is an indication of the need to better understand the contribution to Alaska sablefish productivity from British Columbia and U.S. West Coast sablefish.

Sablefish are assessed as a single population in Federal waters off Alaska with management and regulatory decisions being implemented at the regulatory area level. The NPFMC explicitly considers sablefish life cycle and migration when recommending apportionments of Allowable Biological Catch (ABC) and Overfishing Limit (OFL) between regulatory areas.

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

As the biological stock unit encompasses multiple jurisdictions (i.e. U.S. state and federal) the NPFMC and NMFS consider exploitation by all parties when defining exploitation levels and determining stock health to avoid

[4] http://www.aquamaps.org/receive.php?type_of_map=regular

overfishing/depletion of the resource. The NPFMC apportions the ABC and OFL between regulatory areas based on a 5-year exponential weighting of the survey and fishery abundance indices[5].

1.3./1.4/1.5./1.6. Transboundary stocks

Evidence

As discussed above, the GOA and BSAI sablefish stocks are both considered two parts of the same stock, but separate from sablefish further south along the southern coast of British Columbia and the west coast of North America. To the extent appropriate, NMFS and the NPFMC liaise with other agencies, such as Pacific States Marine Fisheries Commission.

Fisheries researchers and scientists from Alaska work closely with those from Canada on assessing the health of sablefish populations in the North Pacific. The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee[6] meets annually to discuss sablefish and other fisheries. The most recent TSC meeting was conducted in April 2017.

Their discussions incorporate:

- The exchange of information on the status of groundfish stocks of mutual concern and coordinate, whenever possible, desirable programs of research.
- Recommendation of the continuance and further development of research programs having potential value as scientific basis for future management of the groundfish fishery.
- Review of the scientific and technical aspects of existing or proposed management strategies and their component regulations relevant to conservation of stocks or other scientific aspects of groundfish conservation and management of mutual interest.
- Transmission of approved recommendations and appropriate documentation to appropriate sectors of Canadian and U.S. governments and encourage implementation of these recommendations[7].

There is no legal harvesting of sablefish in North Pacific waters outside the national jurisdiction of the USA or Canada. Similarly, there is no sablefish harvesting by U.S. vessels in Canadian waters, or by Canadian vessels in U.S. waters. The Coast Guards of the USA and Canada coordinate enforcement activities, as necessary.

The MSA obligates NMFS to recover the actual costs of management, data collection, and enforcement of the Alaskan IFQ program. NMFS recovers the incremental costs of managing and enforcing the IFQ Program annually through a fee paid by persons who hold a permit granting an exclusive access privilege to a portion of the total allowable catches in IFQ Program fisheries. After each IFQ fishing year, NMFS provides the IFQ permit holder an IFQ Landing Summary and Estimated Fee Liability page. The IFQ permit holder must either accept the accuracy of the NMFS estimated fee liability associated with his or her IFQ landings for each IFQ permit or calculate a revised IFQ fee liability for all or part of his or her IFQ landings using the Fee Submission Form. The IFQ permit holder is responsible for submitting their cost recovery payment to NMFS on or before the due date of January 31st following the year in which the IFQ halibut and sablefish landings were made[8].

[5] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[6] http://www.psmfc.org/tsc2/
[7] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[8] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf

1.7. Review and revision of conservation and management measures

Evidence

The NPFMC annually review their previous, current, and possible future conservation and management measures. The NPFMC sets its agenda for each meeting in response to both current priority issues and possible future changes/events with the potential to impact the sablefish fishery[9] with all meetings being open to the public comment. The continual public input into the NPFMC process effectively provides public scrutiny of the NPFMC's activities with issues being discussed continuously as long as they remain of importance to the stakeholder. The Alaska Board of Fisheries offers a forum for state fisheries and fishermen very much analogous to the NPFMC fora, where conservation and management measures are continuously revised, as need or proposals arise.

The Alaskan halibut and sablefish IFQ program has gone through numerous innovations over the years and has been officially modified many times since initial implementation including modifications to trading restrictions, eligibility rules, administrative catch accounting systems and more. In December 2016 the IPHC released the Twenty-Year Review of the Pacific Halibut and Sablefish Individual Fishing Quota Management Program.

The intent of the review was to evaluate the IFQ Program as required by the MSA and within the framework of the scope requested by the Council and its advisory bodies. Primarily, the IFQ Program was examined with respect to how well it has met its 10 original policy objectives and how it is providing entry opportunities for new participants, an objective that the Council has sought to provide through numerous revisions since the IFQ Program was implemented. The Council, its Advisory Panel (AP), Scientific and Statistical Committee (SSC), and IFQ Implementation Committee all provided feedback on the proposed structure and policy scope of this review document at the December 2015 and February 2016 Council meetings.

In the 20 years since implementation of the IFQ Program, this was the first formal and comprehensive review of the program. However, in this time there have been numerous regulatory impact reviews and reports produced by Council and NMFS staff that provide relevant information about QS ownership and transfers, IFQ use and landings, and with respect to specific provisions in the program. This IFQ Program Review synthesized much of the information provided in these previous reports and analyses[10].

The most current revision of a management measure directly affecting the sablefish fishery in Alaska is the restructured observer program and implementation of Electronic Monitoring for the smallest segment of the fleet[11].

1.8. Transparent management arrangements and decision making

Evidence

NPFMC's management arrangements and decision making processes for the fishery are organized in a very transparent manner. The NPFMC sets its agenda for each meeting in response to both current priority issues and possible future changes/events with the potential to impact the sablefish fishery. The Council (and NMFS) provides

[9] http://www.npfmc.org/council-meeting-archive/
[10] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
[11] https://www.npfmc.org/electronic-monitoring-2/

a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions[12]. The Council actively encourages stakeholder participation, and all Council deliberations are conducted in open, public session. As previously discussed, the Three Meeting Outlook[13] outlines issues likely to be of concern and therefore be discussed at the following three NPFMC meetings affording stakeholders the opportunity to prepare and submit comments for discussion in advance of meetings.

Furthermore, the Alaska Board of Fisheries offers a forum for state fisheries and fishermen very much comparable to the NPFMC fora, where, for example, conservation and management measures are continuously revised, as need or proposals arise.

1.9. Compliance with international conservation and management measures

Evidence

The fishery does not occur in the high seas; as such this Clause is **NOT APPLICABLE.**

[12] http://www.npfmc.org/council-meeting-archive/
[13] http://www.npfmc.org/wp-content/PDFdocuments/meetings/threemeetingoutlook.pdf

7.1.2. Fundamental Clause 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.

Number of Supporting clauses	**10**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

2.1./2.2./2.3./2.4. Policy, legal and institutional frameworks adopted to achieve sustainable and integrated use of marine resources along with mechanisms to avoid conflict shall be in place. Representatives of the fisheries sector and fishing communities shall be consulted in decision making processes and information related to management measures shall be disseminated.

Evidence

No significant change has occurred since the full assessment final report in January 2017. An appropriate policy, legal and institutional framework is adopted in order to achieve sustainable and integrated use of living marine resources, taking into account the fragility of coastal ecosystems, the finite nature of their natural resources and the needs of coastal communities. These include decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. Both the NPFMC and the Alaska BOF decision making processes are open to public input and consultation and the information produced through these fora, for the management of sablefish in Alaska, are publically available.

The NMFS, NPFMC[14] and ADFG cooperatively manage the sablefish fisheries in federal and state waters within the Alaskan EEZ. The NMFS and NPFMC as federal agencies participate in coastal area management-related institutional frameworks through federal National Environmental Policy Act (NEPA) process[15]. NEPA documents are require to be produced each time regulations are renewed or amended meaning all proposed regulations include NEPA considerations. The NEPA process requires information to be made publically available and provides a robust opportunity for public involvement and ensures decisions are made in collaboration with fishery managers, fishermen, fishing organizations and fishing communities.

Other State and federal entities that participate in ensuring the sustainable and integrated use of living marine resources within the Alaskan EEZ include, but are not limited to:

Alaskan Department of Environmental Conservation (DEC)[16]

[14] http://www.npfmc.org/
[15] https://ceq.doe.gov/nepa/Citizens_Guide_Dec07.pdf
[16] http://dec.alaska.gov/

The DEC implements statutes and regulations affecting air, land and water quality and is the lead state agency charged with implementing the federal Clean Water Act.

Alaska Department of Fish and Game (ADFG)[17]

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's Endangered Species program. Annual updates to the fishery biological trends and regulations are made public by this organization[18]. In addition the framework managing natural renewable resources, in a sustainable manner, is outline in Article 8[19].

Alaskan Department of Natural Resources (DNR)[20]

DNR manages all state-owned land, water, and natural resources except for fish and game and use the state Endangered Species Program to preserve the habitats of species threatened with extinction.

DNR Office of Project Management and Permitting (OPMP)[21]

The OPMP coordinates the review of larger scale projects in the state such as transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning.

U.S. Fish and Wildlife Service (USFWS)[22]

The USFWS fulfills functions including enforcement of federal wildlife laws, protection of endangered species, restoration of nationally significant fisheries and conservation and restoration of wildlife habitat. Additionally, the USFWS distributes monies collected through the Sport Fish and Restoration Program to State fish and wildlife agencies for fishery projects, boating access and aquatic education.

Bureau of Ocean Energy Management (BOEM)[23]

The BOEM 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 overlap extensively with those of ADNR, ADFG and ADEC given the potential impacts of such activities on marine resources.

Alaska has institutional and legal frameworks that determine the possible uses of coastal resources, govern access to them and take into account the rights of coastal fishing communities and their customary practices when doing so.

NPFMC processes

[17] http://www.adfg.alaska.gov/
[18] http://www.adfg.alaska.gov/static/fishing/PDFs/sport/2016_annual_report_sf.pdf
[19] http://ltgov.alaska.gov/services/alaskas-constitution/
[20] http://dnr.alaska.gov/
[21] http://dnr.alaska.gov/commis/opmp/
[22] http://www.fws.gov/help/about_us.html
[23] http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf

The Council system mandated under the MSA of which the NPFMC is part was designed so that fisheries management decisions were made at the regional level allowing input from affected stakeholders. NPFMC meetings are open and public testimony is taken ensuring that the rights of coastal communities and their historic access to the fishery are considered in the decision making process.

Dissatisfied parties affected by Council and NMFS decisions can appeal the decision to the Appeals Office in the NMFS Alaska Regional Office, which adjudicates appeals of initial administrative determinations and whose jurisdiction includes the sablefish IFQ and Community Development Quota (CDQ) Programs as well as other management programs. These dispute resolution mechanisms have proven to be effective at dealing with most issues avoiding the necessity for disputes to escalate to the stage of legal action. However, in cases where processes have not resulted in the resolution of disputes, parties can and do resolve the disputes in the federal court system.

The BOF and NPFMC meetings provide fora for resolution of potential conflicts with users being afforded the opportunity to testify in person or in writing. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register. 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. NPFMC –BOF established a joint protocol committee through which regular communication on issues (joint jurisdictional issues) of mutual interest could be discussed[24].

The Western Alaska Community Development Quota (CDQ) Program[25]

The Western Alaskan Community Development Quota (CDQ) Program is a federal fisheries program, authorized and governed by the MSA as amended in 2006 (MSA Section 305(i)(1)), which aims to promote fisheries related economic development in western Alaska. The Program involves 65 eligible communities within a fifty-mile radius of the Bering Sea coastline split into six regional organizations, referred to as CDQ groups. The Program allocates a portion of the BSAI harvest of sablefish to CDQ groups.

Consultation with tribes and Native corporations[26]

In Alaska, NOAA's National Marine Fisheries Service (NMFS) consults with tribes and Native corporations about Federal actions that may affect tribal governments and their members. In fact the Alaska National Interest Lands Conservation Act (ANILCA[27]) which conveyed large sections of federal land to settle Alaska native lands claims specifically directs federal agencies to consult and coordinate with the State of Alaska. Executive Order 13175 sets the framework for regular and meaningful consultation and collaboration with Alaska Native representatives in the development of policies, legislation, regulations, and programs.

Risks and uncertainties related to the policies set up for the management of coastal areas are taken into account

---

24 https://www.google.com/url?q=http://www.iphc.int/meetings/2016am/bb/11_01_HalibutManagementFrameworkv8.pdf&sa=U&ved=0ahUKEwjih4i59brVAhXBblAKHc9CBLkQFggFMAA&client=internal-uds-cse&usg=AFQjCNG2aAAmVeBfswViv8UbcaSbzFEy7Q

25 https://alaskafisheries.noaa.gov/fisheries/cdq

26 https://alaskafisheries.noaa.gov/tribal-consultations

27 http://dnr.alaska.gov/commis/opmp/anilca/

within and throughout the various NEPA processes, NPFMC proceedings as well as through ANILCA and the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP).

2.5. The economic, social and cultural value of coastal resources shall be assessed in order to assist decision-making on their allocation and use.

Evidence

NOAA's Alaska Fisheries Science Center (AFSC) runs the Economic and Social Sciences Research Program in Alaska[28]. The aim of the Program is to provide economic and sociocultural information to assist NMFS in meeting its stewardship responsibilities with activities being conducted in support of this mission including:

- collecting economic and sociocultural data relevant for the conservation and management of living marine resources
- developing models to use that data both to monitor changes in economic and sociocultural indicators and to estimate the economic and sociocultural impacts of alternative management measures
- preparing reports and publications
- participating on NPFMC, NMFS, and inter-agency working groups
- preparing and reviewing research proposals and programs
- preparing analyses of proposed management measures
- assisting Alaska Regional Office and NPFMC staff in preparing regulatory analyses
- providing data summaries

Many of the activities of the Program are conducted in collaboration with other Federal and State agencies and universities. Current research topics being addressed include regional economic impact models, behavioral models of fishing operations, indicators of economic performance, and the non-market valuation of living marine resources.

Regarding socio-economic data collection, AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. This comprehensive report (Fissel, et. al. 2016) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market. This report includes extensive economic data for the commercial ground fisheries in Alaska including sablefish.

In 2005, the Alaska Fisheries Science Center (AFSC) compiled baseline socioeconomic information about 136 Alaska communities most involved in commercial fisheries. Community profiles and their involvement in fishing are now available for 196 communities[29]. In 2010 and 2011, the AFSC went through the process of evaluating the community profiles and determining how to update them. A NOAA Technical Memorandum finalized in October 2011 documents the process been undertaken to update the *Community Profiles for North Pacific Fisheries – Alaska* (NOAA-TM-AFSC-230). In addition, the communities to be included in the updated document were reevaluated to ensure that communities with significant reliance on commercial, recreational and subsistence

[28] http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php
[29] https://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/communitysnapshots/fullmap.php

fishing are included. A total of 196 communities have 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. Introductory materials cover purpose, methods, and an overview of the profiled communities in the larger context of the state of Alaska and North Pacific fisheries. The community profiles comprise additional information including, but not limited to, annual population fluctuation, fisheries-related infrastructure, community finances, natural resources, educational opportunities, fisheries revenue, shore-based processing plant narratives, landings and permits by species, and subsistence and recreational fishing participation, as well as information collected from communities in the Alaska Community Survey, which was implemented during summer 2011, and the Processor Profiles Survey, which was implemented in Fall 2011. https://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php

Evidence of the process implemented and current status with regards to economic, social and cultural value of coastal resources was provided by Fissel, et al 2016, in the report titled, Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. AFSC, NMFS, NOAA, Seattle WA. https://www.afsc.noaa.gov/refm/stocks/plan_team/economic.pdf.

2.6./2.7/2.8. Research and monitoring of the coastal environment, mechanisms for cooperation and coordination, appropriate technical capacities and financial resources, conflict avoidance amongst user groups

Evidence

Monitoring of the coastal environment in Alaska is performed by federal and state agencies. The NMFS and NPFMC as federal agencies participate in coastal area management-related institutional frameworks through federal NEPA processes. Other State and federal entities that cooperate at the sub-regional level in order to improve coastal area management include:

- Alaskan Department of Environmental Conservation (DEC)
- Alaska Department of Fish and Game (ADFG)
- Alaskan Department of Natural Resources (DNR)
- DNR Office of Project Management and Permitting (OPMP)
- U.S. Fish and Wildlife Service (USFWS)
- Bureau of Ocean Energy Management (BOEM)

Other entities involved in collaborative research in the North Pacific region include the Alaska Fisheries Science Center (AFSC), North Pacific Research Board (NPRB), NMFS Pacific Marine Environmental Lab (PMEL) and institutes of higher learning such as the University of Alaska Fairbanks' (UAF) Institute of Marine Science (IMS).

The NPRB funds major research projects in the Gulf of Alaska[30] and the Bering Sea[31] aimed at examining physical and biological mechanisms that determine the survival of juvenile groundfishes in the GOA and understanding the impacts of climate change and dynamic sea ice cover on the eastern BS ecosystem respectively. For oceanography, the NPRB has funded numerous studies describing baseline oceanographic parameters and supported environmental buoy arrays.

PMEL regularly collect oceanographic and environmental data important to understanding the changing habitat

[30] http://www.nprb.org/gulf-of-alaska-project/about-the-project/
[31] http://www.nprb.org/bering-sea-project/about-the-project/

of sablefish and other marine species in Alaskan waters[32].

Additionally, the IPHC which primarily manages halibut (but collects also a good deal of information relative to sablefish management also), in collaboration with Washington Sea Grant, developed a sampling protocol for collecting seabird occurrence data and oceanographic data on the IPHC setline surveys. The 2016 longline research cruise for example was the eighth consecutive year of the IPHC coastwide oceanographic data collection program[33]. Oceanographic data are collected using water column profilers during the IPHC fishery-independent setline survey that spans the area from southern Oregon in the U.S. northward to British Columbia, into the Gulf of Alaska, Bering Sea, and Aleutian Islands. The IPHC has operated profilers since 2000 on a limited basis, and coastwide since 2009. Oceanographic data were collected at a total of 1,206 (or 88%) stations out of a possible 1,366. The coldest near-bottom water (-0.67◦C) was detected, once again, around St. Matthew Island in the Bering Sea. The warmest near-bottom water (12.25◦C) was the shallow water off the southern end of Kodiak Island. The U.S. West Coast once again had the lowest near-bottom dissolved oxygen of the surveyed area, but the hypoxic zone that was prevalent for several years (through 2013) was not detected. Counts of live seabirds, taken immediately following gear retrieval, have been conducted during IPHC fishery-independent setline surveys since 2002. The Convention waters, extending from off Oregon northward to Alaska and the EEZ border with Russia, are surveyed annually between late May and early September. A total of 19,553 seabird counts have been conducted over the last 15 years, with 1,362 occurring in 2016[34].

ADFG Habitat Division[35] conducts research on coastal and marine environments throughout Alaska in an effort to document and mitigate human-related impacts, changes in habitat and species abundance. The agency also collects physical and chemical data, including temperature, depth, salinity and conductivity during their St. Matthew's pot survey using data loggers placed on the survey pots.

The NMFS' Habitat Conservation Division (HCD) works to avoid, minimize, or offset adverse anthropogenic effects on Essential Fish Habitat (EFH) and living marine resources in Alaska. This work includes conducting and/or reviewing environmental analyses for a large variety of activities including commercial fishing. The HCD focuses on activities in habitats used by federally managed fish species in marine, estuarine, and freshwater areas[36].

The Coast Guard enforces fisheries laws at sea including regulations to aid the protection and/or recovery of marine protected species and their associated habitats[37].

The costs incurred by the NMFS in its management of the Alaska IFQ Program are recovered as obligated by the MSA through a fee to be paid by IFQ fishermen based on the ex-vessel value of their catches landed under the Program.

The BOF and NPFMC meetings provide fora for resolution of potential conflicts with users being afforded the opportunity to testify in person or in writing. These dispute resolution mechanisms have proven to be effective at

[32] http://www.pmel.noaa.gov
[33] http://www.iphc.washington.edu/publications/rara/2016/IPHC-2016-RARA-26-R-5.1_Oceanographic_monitoring.pdf

[34] http://www.iphc.washington.edu/publications/rara/2016/IPHC-2016-RARA-26-R-3.7_Trends_in_seabird_counts.pdf
[35] http://www.adfg.alaska.gov/index.cfm?adfg=habitatresearch.main
[36] http://www.fakr.noaa.gov/habitat/default.htm
[37] http://www.uscg.mil/hq/cg5/cg531/LMR.asp

dealing with most issues avoiding the necessity for disputes to escalate to the stage of legal action. However, in cases where processes have not resulted in the resolution of disputes, parties can and do resolve the disputes in the federal court system.

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.

7.1.3. Fundamental Clause 3

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

Number of Supporting clauses	**7**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

3.1. Long-term management objectives shall be translated into a plan or other management document and be subscribed to by all interested parties.

Evidence

No significant change has occurred since the full assessment final report in January 2017. The NPFMC is bound by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) which is the primary domestic legislation governing management of marine fisheries in U.S. waters. The MSA sets out ten National Standards Guidelines for fishery conservation and management, specifies long-term objectives for U.S. fisheries and establishes a formal set of processes for the setting of short-term objectives and management measures aimed at achieving those long-term objectives.

The NPFMC outlines its management objectives for groundfish fisheries in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands Management Area (BSAI) in two separate FMPs[38,39]. These management objectives are consistent across both FMPs and are intended to frame consideration of potential management measures at annual NPFMC meetings. As of the August 2015 editions of both FMPs, a total of 45 objectives for GOA and 46 for BSAI, organized into 9 broader policy objectives, have been outlined. The policy objectives into which the management objectives are currently organized are:

- Prevent Overfishing
- Promote Sustainable Fisheries and Communities
- Preserve Food Web
- Manage Incidental Catch and Reduce Bycatch and Waste
- Avoid Impacts to Seabirds and Marine Mammals
- Reduce and Avoid Impacts to Habitat
- Promote Equitable and Efficient Use of Fishery Resources
- Increase Alaska Native Consultation
- Improve Data Quality, Monitoring and Enforcement

The NPFMC develops its fishery regulations pursuant and these regulations are implemented only after review and rulemaking conducted by the NMFS. The NPFMC process is extremely transparent and inclusive of all stakeholders; all stakeholders are active participants.

[38] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[39] http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

The main State fisheries for Sablefish also have fishery management plans and these can be found in the 2017-2018 Statewide Commercial Fisheries Regulations for 2017-2018[40].

3.2. Management measures should limit excess fishing capacity, promote responsible fisheries, take into account artisanal fisheries, protect biodiversity and allow depleted stocks to recover.

Evidence

The federal IFQ sablefish fisheries are all closed access fisheries. All but the small Cook Inlet state fishery are also closed access fisheries. However the Cook Inlet fishery is managed using Guideline Harvest Levels (GHLs) and other management measures to ensure the harvest remains within set limits[41].

In 1995 NMFS implemented the NPFMC's program of Individual Fishing Quotas (IFQs) established under amendments 15 and 20 to the BSAI and GOA FMPs. The IFQ program was explicitly intended to alleviate excess fishing capacity and improve the economic viability of the industry. The quota share system resulted in the removal of excess fishing capacity, fewer active vessels deploying less gear, greatly extended fishing seasons and increased economic viability within the fishing industry. The rationalization program has incentivized responsible fishing practices with gear losses, damage as a result of on-deck sorting and deadloss all having been reduced. Prior to rationalization, all vessels participated in a "race to fish" scenario. When the fisheries were rationalized, the number of qualifying vessels was reduced. In 2017, fewer vessels are needed to take the TAC thereby reducing operational costs and increasing overall efficiency.

The Western Alaska Community Development Quota (CDQ) program, intended to help develop commercial fisheries in communities of the BSAI coast, by allowing them exclusive access to specified amounts of halibut and sablefish in the BSAI management area, was established in parallel to the IFQ program.

All state and federal managed fisheries are well within target reference point and are not depleted as shown below in a summary table (Table 1) from the 2017 federal SAFE assessment[42].

[40] www.adfg.alaska.gov/static-f/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groundfish.pdf
[41] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[42] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

Table 1: Sablefish stock update 2017. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf)

Summary of Results

Quantity/Status	As estimated or specified *last* year for: 2016	2017	As estimated or recommended *this* year for: 2017*	2018*
M (natural mortality rate)	0.1	0.1	0.097	0.097
Tier	3b	3b	3b	3b
Projected total (age 2+) biomass (t)	204,796	214,552	239,244	249,252
Projected female spawning biomass (t)	86,471	81,986	91,553	89,601
$B_{100\%}$	257,018	257,018	264,590	264,590
$B_{40\%}$	102,807	102,807	105,836	105,836
$B_{35\%}$	89,956	89,956	92,606	92,606
F_{OFL}	0.093	0.086	0.097	0.097
$maxF_{ABC}$	0.078	0.073	0.081	0.078
F_{ABC}	0.078	0.073	0.078	0.076
OFL (t)	13,937	12,747	15,931	16,145
max ABC (t)	11,795	10,782	13,509	13,688
ABC (t)	11,795	10,782	13,083	13,256
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
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 10,348 t and 10,142 t used in place of maximum permissible ABC for 2017 and 2018. This was done in response to management requests for a more accurate two-year projection.

7.2. Section B. Science and Stock Assessment Activities

7.2.1. Fundamental Clause 4

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

Number of Supporting clauses	**13**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Compliance
Non Conformances	N/A

Summarized evidence:

4.1. All fishery removals and mortality of the target stock(s) shall be considered by management.

Evidence

No significant change has occurred in the principles and methods with regards to the monitoring and management of fishery removals and mortality of the target stock, since the full assessment final report in January 2017. 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 time series of collections.

Survey activities

A number of fishery independent surveys catch sablefish. The survey indices included in the model for the 2016 SAFE assessment are the AFSC longline survey (conducted in 2016) and the AFSC GOA bottom trawl survey (conducted in 2015, see Table 2 below for details). For other surveys that occur in the same or adjacent geographical areas, but are not included as separate indices in the model, we provide trends and comparative analyses to the AFSC longline survey.

Table 2: Summary of data sources, types and years available for the sablefish stock. (Source: Hanselman et al 2014)

Source	Data	Years
Fixed gear fisheries	Catch	1960-2016
Trawl fisheries	Catch	1960-2016
Japanese longline fishery	Catch-per-unit-effort (CPUE)	1964-1981
U.S. fixed gear fishery	CPUE, length	1990-2015
	Age	1999-2015
U.S. trawl fisheries	Length	1990,1991,1999, 2005-2015
Japan-U.S. cooperative longline survey	CPUE, length	1979-1994
	Age	1981, 1983, 1985, 1987, 1989, 1991, 1993
Domestic longline survey	CPUE, length	1990-2016
	Age	1996-2015
NMFS GOA trawl survey	Abundance index	1984, 1987, 1990, 1993, 1996, 1999, 2003, 2005, 2007, 2009, 2011, 2013, 2015
	Lengths	1984, 1987, 1990, 1993, 1996, 1999, 2003, 2005, 2007, 2009, 2011, 2013, 2015

The catches used in the Dec 2016 SAFE for sablefish (*Table 3*) include catches from minor State-managed fisheries in the northern GOA and in the AI region because fish caught in these State waters are reported using the area code of the adjacent Federal waters in the Alaska Regional Office catch reporting system, the source of the catch data used in this assessment. Minor State fisheries catches averaged 180 t from 1995-1998, about 1% of the average total catch. Most of the catch (80%) is from the AI region. The effect of including these State waters catches in the assessment is to overestimate biomass by about 1%, a negligible error considering statistical variation in other data used in this assessment. Catches from state areas that conduct their own assessments and set Guideline Harvest levels (e.g., Prince William Sound, Chatham Strait, and Clarence Strait), are not included in the SAFE assessment[43].

[43] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

Table 3: Alaska sablefish catch (t). The values include landed catch and discard estimates. Eastern includes West Yakutat and East Yakutat / Southeast. 2016 catches are as of September 25, 2016 (Source: www.akfin.org).

Year	Grand total	BY AREA								BY GEAR	
		Bering Sea	Aleu-tians	Western	Central	Eastern	West Yakutat	East Yak/SEO	Un-known	Fixed	Trawl
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	16,411	1,012	1,118	2,118	6,994	5,170	1,822	3,347	0	14,351	2,060
2004	17,520	1,041	955	2,173	7,310	6,041	2,241	3,801	0	15,864	1,656
2005	16,585	1,070	1,481	1,930	6,706	5,399	1,824	3,575	0	15,029	1,556
2006	15,551	1,078	1,151	2,151	5,921	5,251	1,889	3,362	0	14,305	1,246
2007	15,958	1,182	1,169	2,101	6,004	5,502	2,074	3,429	0	14,723	1,235
2008	14,552	1,141	899	1,679	5,495	5,337	2,016	3,321	0	13,430	1,122
2009	13,062	916	1,100	1,423	4,967	4,656	1,831	2,825	0	12,005	1,057
2010	11,929	753	1,045	1,354	4,508	4,269	1,578	2,690	0	10,924	1,004
2011	12,974	705	1,024	1,400	4,924	4,921	1,896	3,024	0	11,795	1,179
2012	13,867	742	1,205	1,353	5,329	5,238	2,033	3,205	0	12,765	1,102
2013	13,642	634	1,061	1,384	5,207	5,355	2,108	3,247	0	12,605	1,037
2014	11,574	312	812	1,202	4,756	4,492	1,671	2,822	0	10,549	1,025
2015	10,971	210	430	1,014	4,646	4,671	1,841	2,830	0	9,886	1,085
2016	8,818	382	283	803	3,580	3,769	1,573	2,196	0	7,670	1,148

Table 4: 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 2010- 2016. (Source: NMFS Alaska Regional Office via AKFIN, September 25, 2016)

Year	Gear	BSAI			GOA			Combined		
		Discard	%Discard	Catch	Discard	%Discard	Catch	Discard	%Discard	Catch
2010	Total	39	2.16%	1,798	419	4.13%	10,131	458	3.84%	11,929
	H&L	33	2.82%	1,184	371	4.02%	9,231	405	3.89%	10,415
	Other	5	0.88%	613	47	5.27%	900	53	3.49%	1,514
2011	Total	25	1.44%	1,729	575	5.11%	11,245	600	4.63%	12,974
	H&L	18	1.63%	1,093	396	3.90%	10,147	414	3.68%	11,240
	Other	7	1.12%	637	179	16.33%	1,097	186	10.75%	1,734
2012	Total	24	1.23%	1,947	318	2.67%	11,921	342	2.47%	13,867
	H&L	13	1.10%	1,197	253	2.29%	11,060	266	2.17%	12,257
	Other	11	1.45%	749	65	7.52%	861	76	4.69%	1,610
2013	Total	30	1.75%	1,696	646	5.40%	11,947	675	4.95%	13,642
	H&L	26	2.44%	1,065	598	5.39%	11,101	624	5.13%	12,166
	Other	4	0.59%	630	48	5.62%	846	51	3.47%	1,476
2014	Total	30	2.67%	1,124	516	4.94%	10,450	546	4.72%	11,574
	H&L	29	3.89%	739	438	4.62%	9,483	467	4.57%	10,223
	Other	1	0.33%	385	78	8.09%	967	80	5.88%	1,351
2015	Total	18	2.86%	640	777	7.52%	10,330	795	7.25%	10,971
	H&L	13	2.67%	488	593	6.39%	9,276	606	6.20%	9,764
	Other	5	3.48%	153	184	17.43%	1,054	189	15.67%	1,207
2016	Total	42	6.31%	665	692	8.49%	8,152	734	8.33%	8,818
	H&L	36	11.28%	316	561	7.75%	7,236	597	7.90%	7,552
	Other	6	1.83%	350	131	14.35%	916	138	10.89%	1,266
2010-2016	Total	39	2.16%	1,798	419	4.13%	10,131	458	3.84%	11,929
Mean	H&L	33	2.82%	1,184	371	4.02%	9,231	405	3.89%	10,415
	Other	5	0.88%	613	47	5.27%	900	53	3.49%	1,514

In the **Southeast Region** the 2016 Northern southeastern inside (NSEI) sablefish fishery opened August 15 and

closed November 15. The 78 permit holders landed a total of 293 mt of sablefish. The fishery is managed by equal quota share; each permit holder was allowed 3.8 mt. In Southern southeastern inside (SSEI), 20 permits were designated to be fished with longline gear and 3 permits for pot gear. Twenty-three permit holders landed a total of 216 mt of sablefish, each with an equal quota share of 9.5 mt. SSEI longline fishery CPUE has remained fairly stable in the last four years (0.30–0.33 lb/hook from 2012–2015).

The 2016 Prince William Sound (**PWS)** sablefish fishery opened April 15 with a GHL of 50.3 mt and closed by regulation on August 31. PWS sablefish harvest totaled 18.4 mt, up from the 7.7 mt historical low in 2015, although still the second lowest harvest on record and less than 20% of the historical average[44].

4.2. An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures shall be established.

Evidence

At-sea and at plant observer programs are established and provide important fishery catch, length, and age data. Beginning January 1, 2013, amendment 86 (BSAI) and amendment 76 (GOA) were added to the Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the Exclusive Economic Zone Off Alaska. In compliance with the MSA, these amendments restructured the funding and deployment system for observers in the North Pacific groundfish and halibut fisheries and include some vessels less than 60 ft. in length, as well as halibut vessels in the North Pacific Groundfish Observer Program.

Fishery information is available from longline sets that target sablefish in the IFQ fishery. Records of catch and effort for these vessels are collected by observers and by vessel captains in voluntary and required logbooks. Fishery data from the Observer Program is available since 1990. Logbooks are required for vessels over 60 feet beginning in 1999. Since 2000, a longline fishery catch rate index has been derived from observed sets and logbook data for use in the model and in apportionment.

The NPFMC has established an intention to integrate electronic monitoring (EM) into the Observer Program for the fixed gear small-boat groundfish and halibut fisheries, so that EM may be used to collect data to be used in catch estimation (retained and discarded) for this fleet. The NPFMC has set an interim goal of pre-implementation in the small boat (40-57.5 feet length overall) longline fleet in 2016, focusing on vessels that have trouble carrying an observer due to various limitations.

As part of the 2017 Annual Deployment Plan (ADP) and recognizing the challenging logistics of putting observers on small vessels, NMFS continues to recommend that vessels less than 40ft be in the no selection pool for observer coverage but be considered for testing of electronic monitoring since NMFS has no data from this segment of the fleet. NMFS recommends continuing to allow hook-and-line and pot vessels <57.5 ft LOA where taking an observer is problematic an opportunity to 'opt-in' to the EM selection pool to participate in the EM cooperative research under the 2017 EM pre-implementation plan that is being developed by the EM workgroup. NMFS also recommends that vessels participating in the EM selection pool be required to log trips in Observer Declare and Deployment System (ODDS[45]). This will improve the ability of NMFS to determine which vessels are in the EM selection pool, when they are fishing, and provides a necessary compliance monitoring tool.

[44] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[45] https://chum.afsc.noaa.gov:7104/apex/f?p=140:1

Observer at-sea deployment

- The program met expected rates of coverage for all of the full coverage and trip-selection strata.
- In the trip selection strata, the realized (and expected) coverage rates were 15.0% (15.41%) for hook-and-line vessels.

EM selection pool

- In 2016 vessels participating in the EM selection pool were not required to log trips in ODDS, instead there were two selection processes:
- EM Voluntary 30%: vessels were required to notify NMFS of their intent to fish at least 30 days in advance of each of 4 selection time-periods: Jan-Feb, Mar-Jun, Jul-Oct, and Nov-Dec. Vessels were subject to a 30% chance of selection and if selected, they carried EM for all trips during the time period.
- EM Voluntary 100%: Vessels that did not notify NMFS 30 days in advance of a time period were automatically selected to carry an EM system, if one was available.
- The EM Voluntary 30% strata met the coverage rate expectations for three out of four fishing periods. In the fourth period (Nov-Dec), no vessels notified NMFS of their intent to fish and thus no vessels were selected.
- The EM Voluntary 100% strata did not meet expected coverage rates in any fishing period.

Overall, in 2016, through the Electronic Monitoring (EM) Pre-implementation plan, EM was offered to all hook-and-line vessels 40-57.5 ft in length. A total of 42 vessels opted-in to the EM selection pool, 24 of which were selected to carry EM systems.
In March 2017, NMFS published a proposed rule to implement EM as a new component of the fishery research plan (see: https://www.federalregister.gov/documents/2017/03/23/2017-05753/fisheries-of-the-exclusive-economic-zoneoff-alaska-integrating-electronic-monitoring-into-the-north).

Notable changes to observer deployment on vessels in the partial coverage category for 2017 include the specific strata definitions, associated selection rates, and further expansion of participation in EM cooperative research and the EM selection pool. Based on recommendations from the Council in June 2016, NMFS evaluated two additional changes to the strata definitions for the 2017 ADP: 1) different treatment of trips from vessels delivering to tender vessels and those that do not deliver to tender vessels and 2) separate treatment of catcher/processors in the partial coverage category (NMFS 2016a). Following analysis in the Draft 2017 ADP (NMFS 2016c), the NMFS and Council adopted the following stratification scheme (see table below) with sample sizes allocated according to an optimization based on discarded groundfish for the 2017 ADP (NMFS 2016b).

In Table 5, some updated information on changes in the Observer Program sampling design is provided. This included definition of sampling strata, selection pools, and observer coverage categories in each year from 1990 to 2017. The observer coverage rates set through the Annual Deployment Plan are noted in black and the realized coverage rates evaluated in the Annual Report are noted in parentheses. CP = catcher/processor vessel; CV = catcher vessel; H&L = hook-and-line gear; LOA = vessel length overall.

Table 5: Changes in Observer program sampling design 1990 -2017. (Source: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPreimpPlan.pdf)

<table>
<tr><th rowspan="2">Year</th><th>Full observer coverage category</th><th colspan="3">Partial observer coverage category</th></tr>
<tr><th>Full selection pool
Observer coverage required on all trips</th><th>Trip selection pool
Observer coverage required on all randomly selected trips</th><th>Vessel selection pool
Randomly selected vessels required to carry an observer for all trips in a time period</th><th>No selection pool
Observer coverage not required</th></tr>
<tr><td>2017</td><td>Regulatory full ≥ 100%</td><td>Trawl: 18% | Trawl Tender: 14% | H & L: 11% | H & L Tender: 25% | Pot: 4% | Pot Tender: 4%</td><td rowspan="5">N/A</td><td rowspan="5">Vessels <40' LOA and Jig gear</td></tr>
<tr><td>2016</td><td rowspan="4">Regulatory full | Opt-in Full</td><td>Trawl: 28% (28.0) | H & L: 15% (15.0) | Pot: 15% (14.7)</td></tr>
<tr><td>2015</td><td>Large Vessel: 24% (23.4)
• Trawl CVs
• Small CPs
• H&L/Pot CVs ≥ 57.5'
Small Vessel: 12% (11.2)
• H&L/Pot CVs >40' and <57.5'</td></tr>
<tr><td>2014</td><td>All Trawl CVs and H&L/Pot vessels ≥ 57.5': 16% (15.1)</td><td>H&L/Pot CVs >40' and <57.5': 12% (15.6)</td></tr>
<tr><td>2013</td><td>All Trawl CVs and H&L/Pot vessels ≥ 57.5': 14.5% (14.8)</td><td>H&L/Pot CVs >40' and <57.5': 11% (10.6)</td><td>Vessels <40' LOA and Jig gear</td></tr>
<tr><td colspan="5">Observer Program Restructure</td></tr>
<tr><td>1990 - 2012[7]</td><td>Regulatory Full ≥ 100%</td><td colspan="3">Vessels self-selected coverage (i.e., choose when to take an observer)
• 30% of fishing days by gear/quarter and at least one trip per fishery.
• CVs ≥ 60' and < 125' LOA targeting groundfish
• Other CPs and processing plants when not required 100%.</td></tr>
</table>

[7] Coverage requirements are generalized based on requirements implemented prior to 2013.

The definition of the "no selection pool" in 2017 is similar to that used in 2015 and 2016 and includes fixed gear vessels less than 40 ft LOA, all vessels fishing with jig gear (which includes handline, jig, troll, and dinglebar troll gear), and vessels participating in the EM Selection Pool.

The EM Selection Pool has been expanded since 2016. For 2017 the Council recommended expanding the number of vessels to 90 hook-and-line vessels and 30 pot vessels. To date there have been 72 hook-and-line vessels and 18 pot vessels for a total of 91 fixed-gear vessels that have volunteered to participate in the EM selection pool to carry EM systems as described in the 2017 EM Pre-Implementation Plan (see http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPreimpPlan.pdf). Five vessels volunteered to carry stereo camera equipment and were also included in the no selection pool.

In Table 6, the total catch (retained and discard) of observed halibut and sablefish (in metric tons) caught in 2016 is provided by *catcher/processors (row 1 and 2) and catcher vessels (row 3 and 4) in the Gulf of Alaska*. Empty cells indicate that no catch occurred.

Table 6: Total catch (retain and discarded) of observed halibut and sablefish (mt) in 2016. (Source: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPreimpPlan.pdf)

	GULF OF ALASKA CATCHER/PROCESSORS											
	HOOK AND LINE			JIG			NON-PELAGIC TRAWL			POT			PELAGIC TRAWL		
	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%
Pacific Halibut															
Retained															
Discarded	810	822	**98%**				343	343	**100%**						
Sablefish (Black Cod)															
Retained	275	348	**79%**				385	385	**100%**						
Discarded	54	58	**93%**				98	98	**100%**						

	GULF OF ALASKA CATCHER VESSELS														
	HOOK AND LINE			JIG			NON-PELAGIC TRAWL			POT			PELAGIC TRAWL		
	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%
Pacific Halibut															
Retained	1,042	8,657	**12%**	0	4	**0%**									
Discarded	839	7,874	**11%**				222	1,566	**14%**	22	153	**14%**	19	22	**87%**
Sablefish (Black Cod)															
Retained	965	7,463	**13%**	0	<1	**0%**	295	452	**65%**				3	29	**11%**
Discarded	69	673	**10%**				9	80	**11%**	1	7	**17%**	<1	3	**12%**

In Table 7, information on total catch (retained and discard) of observed halibut and sablefish (in metric tons) caught in 2016 by *catcher/processors (row 1 and 2),* by *catcher vessels delivering to motherships (row 3 and 4), and by catcher vessels delivering to shoreside (row 5 and 6) in the Bering Sea/Aleutian Islands*. Empty cells indicate that no catch occurred.

Table 7: Total catch (retain and discarded) of observed halibut and sablefish (mt) in 2016, including catcher vessels delivering to shoreside. (Source: http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPreimpPlan.pdf)

	BERING SEA/ALEUTIAN ISLANDS CATCHER/PROCESSORS														
	HOOK AND LINE			JIG			NON-PELAGIC TRAWL			POT			PELAGIC TRAWL		
	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%
Pacific Halibut															
Retained															
Discarded	2,418	2,426	**100%**				2,240	2,240	**100%**	6	6	**100%**	83	83	**100%**
Sablefish (Black Cod)															
Retained	84	117	**72%**				263	263	**100%**				12	12	**100%**
Discarded	63	63	**100%**				5	5	**100%**				1	1	**100%**

	BERING SEA/ALEUTIAN ISLANDS CATCHER VESSELS DELIVERING TO MOTHERSHIPS														
	HOOK AND LINE			JIG			NON-PELAGIC TRAWL			POT			PELAGIC TRAWL		
	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%
Pacific Halibut															
Retained															
Discarded							220	220	**100%**				2	2	**100%**
Sablefish (Black Cod)															
Retained							1	1	**100%**				<1	<1	**100%**
Discarded							<1	<1	**100%**						

	BERING SEA/ALEUTIAN ISLANDS CATCHER VESSELS DELIVERING TO SHORESIDE														
	HOOK AND LINE			JIG			NON-PELAGIC TRAWL			POT			PELAGIC TRAWL		
	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%	Observed	Total	%
Pacific Halibut															
Retained	306	1,975	**16%**												
Discarded	90	646	**14%**				198	404	**49%**	3	23	**15%**	20	20	**100%**
Sablefish (Black Cod)															
Retained	7	221	**3%**				0	<1	**0%**	61	177	**34%**	5	5	**100%**
Discarded	1	14	**6%**							1	2	**46%**	1	1	**100%**

4.3. Management entities shall make data available in a timely manner and in an agreed format in accordance with agreed procedures.

Evidence

NMFS and ADFG have extensive scientific databases which include sablefish. NPFMC has substantial information on management of sablefish in Alaskan waters. These data are made widely available throughout the year to allow for timely resource management, such as quota setting; through the agency websites, publications and at various publically-attended meetings. Data on certain aspects of commercial fishing are confidential, such as individuals or individual vessels in the analysis of fishery CPUE data, depending on the number of individuals or entities involved[46]. The Commercial Fisheries Entry Commission[47] is the designated records manager for ADFG fish ticket records. Fish ticket records are retained by the Commission for 45 years, and are confidential as defined by AS 16.05.815 and 16.40.155.

[46] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[47] https://www.cfec.state.ak.us/

4.4/4.5. States shall stimulate the research required to support national policies related to fish as food and collect sufficient knowledge of social, economic and institutional factors relevant to the fishery in question to support policy formulation.

Evidence

State and national policies regarding seafood are guided by the Alaska Seafood Marketing Institute (ASMI), U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and the U.S. National Institute of Health (NIH). ASMI is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training and sustainability certification. ASMI's role includes conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state[48].

Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska (Fissel et al. 2016)[49]. This comprehensive report provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, including flatfish, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market.

4.6. States shall investigate and document traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development.

Evidence

The sablefish fisheries in Alaska are well established and any original knowledge and technologies has been part of the evolution of the mature fisheries as it is today. Virtually all data from the state and federally managed sablefish fisheries are included in the stock assessments (Hanselman et al. 2016). There is minimal recreational, personal use, or subsistence fishing for sablefish in Alaskan waters, and all estimates are included in the catch data.

At the 2012 BOF meeting, a regulation was passed to require personal use and subsistence use sablefish permits, and at the 2015 BOF meeting, limits were defined for personal use sablefish fisheries for the number of fish, number of permits per vessel, and number of hooks. No changes were made to sablefish subsistence fisheries in 2015[50]. Southeast sablefish subsistence and personal use fishing permits for 2017 were available from May 2017[51].

4.7. States conducting scientific research activities in waters under the jurisdiction of another State shall ensure

[48] http://www.alaskaseafood.org/quality/
[49] https://www.afsc.noaa.gov/REFM/Docs/2016/economic.pdf
[50] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[51] Southeast Sablefish Subsistence And Personal Use Fishing Permit And Harvest Reporting Available Online

that their vessels comply with the laws and regulations of that State and international law.

Evidence

Data from the annual setline survey conducted by IPHC, using commercial vessels from USA and Canada, are considered in the annual sablefish assessments. In 2016 the survey encompassed both nearshore and offshore waters of southern Oregon, Washington, British Columbia, southeast Alaska, the central and western Gulf of Alaska, Aleutian Islands, and the Bering Sea continental shelf[52]. Thus only the waters under jurisdiction of USA and Canada were surveyed. Survey activities were compliant with all laws and regulations of those countries, registered commercial halibut vessels were chartered, and all catches in the survey were recorded and reported.

Other scientific surveys used directly, or considered, in the sablefish stock assessments include NMFS annual setline and trawl surveys in GOA and BSAI, surveys by ADF&G in state waters, and a trap survey by DFO (Canada) in British Columbia. None of these surveys cross any international boundaries (Henry et al 2017).

4.8. States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas.

Evidence
As this stock of sablefish is not distributed in high seas areas, there is no research conducted in those waters.

4.9/4.10/4.11. States shall promote and enhance the research capacities of developing countries, support (upon request) States engaged in research investigations aimed at evaluating stocks which have been previously un-fished or very lightly fished.

Not applicable for this fishery

[52] http://www.iphc.washington.edu/publications/rara/2016/IPHC-2016-RARA-26-R-3.1_2016_IPHC_fishery_independent_survey.pdf

7.2.2. Fundamental Clause 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.

Number of Supporting clauses	**7**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized Evidence:

5.1 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. The research shall be disseminated accordingly. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

Evidence

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. Appropriate research is conducted for the management of sablefish in Alaska waters. The NMFS and ADFG conduct assessment surveys on sablefish in Alaskan waters. The NMFS conducts an annual longline survey and a biennial trawl survey in the Gulf of Alaska and the Aleutian Islands (alternating years between the two regions), and an annual trawl survey in the Eastern Bering Sea and ADFG performs annual longline surveys in Chatham and Clarence Strait. These surveys provide estimates of catch per unit effort, relative abundance, and biological data. In addition, tagging studies exist to study sablefish movement for federal, state, and Canadian waters. The ADFG conducts an annual tagging survey in Chatham Strait as part of a mark-recapture study to estimate population abundance.

Further investigations into the migration of sablefish are being conducted in Alaska. The NMFS is working on a migration model that includes both federal and state waters. In addition, the ADFG is conducting pilot studies to determine the feasibility of acoustic tagging of sablefish in Chatham Strait.

In addition, research is being conducted on sperm whale interactions with the sablefish longline fisheries. Researchers are determining ways to reduce or eliminate whale interactions and how to quantify whale depredation rates[53].

The NMFS longline survey abundance index increased 34% from 2015 to 2016 following a 21% decrease from 2014 to 2015 which was the lowest point of the time series. The fishery abundance index decreased 12% from 2014 to 2015 and is the time series low (the 2016 data are not available yet). There was no Gulf of Alaska (GOA) trawl survey in 2016. Spawning biomass is projected to decrease slightly from 2017 to 2019, and then stabilize.

[53] http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.research

New data utilized in the 2016 assessment model, included;

- relative abundance and length data from the 2016 longline survey,
- relative abundance and length data from the 2015 longline fishery,
- length data from the 2015 trawl fisheries,
- age data from the 2015 longline survey and 2015 fixed gear fishery, and
- updated catch for 2015, and projected 2016 - 2018 catches.

In addition to these usual new data updates, the following substantive new changes were made to the data inputs;
1) New analytical variance calculations for the domestic longline survey abundance index,
2) New area sizes for the domestic longline survey abundance index,
3) Domestic longline survey estimates corrected for sperm whale depredation,
4) Estimates of killer and sperm whale depredation in the fishery,

North Pacific Research Board (NPRB)[54]
The NPFB conducts research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean prioritizing on research efforts designed to address pressing fishery management or marine ecosystem information needs.

Bering Sea Integrated Ecosystem Research Program[55]
The Bering Sea Integrated Ecosystem Research Program is a $52 million partnership between the NPRB and the National Science Foundation (NSF) that seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than one hundred scientists are engaged in field research and ecosystem modeling to link climate, physical oceanography, plankton, fishes, seabirds, marine mammals, humans, traditional knowledge and economic outcomes to better understand the mechanisms that sustain this highly productive region.

The Gulf of Alaska Integrated Ecosystem Research Project (IERP)[56]
The Gulf of Alaska Integrated Ecosystem Research Project (IERP) is a program of the NPRB that seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals, and seabirds within the GOA. Implementation of the GOA IERP is structured around four separately completed components which will link together to form a fully integrated ecosystem study in the Gulf of Alaska. The four components of this program are:

Upper Trophic Level (UTL)
The overall goal of this component focuses on identifying and quantifying the major ecosystem processes that regulate recruitment strength of key groundfish species (arrowtooth flounder, Pacific cod, Pacific Ocean perch, sablefish, and walleye pollock) in the GOA. The focus is on a functional group of five predatory fish species that are commercially important and account for most of the predatory fish biomass in the GOA. Taken together they encompass a range of life history strategies and geographic distributions that provide contrast to explore regional ecosystem processes.

[54] http://www.nprb.org/
[55] http://www.nprb.org/bering-sea-project
[56] http://gulfofalaska.nprb.org/

Forage Base
To focus on forage base and resources which influence the productivity of the top level predator(s) chosen. The type, quality and quantity of food, and its timing and location, are critical to understanding higher trophic level responses.

Lower Trophic Level and Physical Oceanography
To focus on biological and physical oceanographic parameters on which this portion of the ecosystem is based. This includes euphausiids, fish eggs, and larval fishes.

Ecosystem Modeling
Focus is to describe and predict the responses (and variability therein) of this portion of the GOA ecosystem to environmental and anthropogenic processes, including climate change.

Also, the Pacific States Marine Fisheries Commission[57] coordinates research activities, monitors fishing activities, collects and maintains databases on marine fish occurring off the California, Oregon, Washington, and Alaska coast.

Another major ecosystem research report is the AFSC Ecosystem Consideration Report series (see https://access.afsc.noaa.gov/reem/ecoweb/) The Ecosystem Considerations reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the North Pacific Fishery Management Council, the scientific community and the public. As of 2016, there are separate reports for the Eastern Bering Sea (EBS), Aleutian Islands (AI), the Gulf of Alaska (GOA), and Arctic (forthcoming) ecosystems. These reports include ecosystem assessments, and ecosystem-based management indicators that together provide context for ecosystem-based fisheries management in Alaska.

Regarding socio-economic data collection, AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. This comprehensive report (Fissel, et. al. 2016) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market. This report includes extensive economic data for the commercial sablefish fishery.

In addition, since 2002 the IPHC has been working cooperatively with the Alaska Department of Environmental Conservation (ADEC) in a project monitoring environmental contaminants in Alaskan fish. The fish being studied include salmon (5 species), sheefish, pike, pollock, pacific cod, lingcod, black rockfish, sablefish, and halibut. The fish are analyzed for organochlorine pesticides, dioxins, furans, polybrominated diphenyl ethers, PCB congeners, methyl mercury and heavy metals (arsenic, selenium, lead, cadmium, nickel, and chromium). Results from these studies are used to identify ADEC's future research needs.

[57] http://psmfc.org

To date, 2,088 samples have been tested by ADEC. The mean level of total mercury for these samples has been 0.309 ppm (for comparison, the Food and Drug Administration (FDA) limit of concern is based on methyl mercury (~85% of total mercury) levels of 1.000 ppm, the Environmental Protection Agency (EPA) and Canadian Food Inspection Agency (CFIA) level of concern is 0.500 ppm) ranging from non-detectable to 2.000 ppm.

Analysis by the Alaska Department of Health and Social Services (DHSS) has found that most species of Alaska fish contain mercury levels that are too low to constitute a health risk. However, some Alaska fish species are consistently found to have elevated mercury levels; as such, consumption restrictions for these species are warranted for pregnant women, women of childbearing age that may become pregnant, nursing mothers, and children[58].

5.2. The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration shall be monitored.

Evidence

The state of the sablefish stock is monitored mainly through survey and resulting stock assessment activities. Longline survey abundance index increased 34% from 2015 to 2016 following a 21% decrease from 2014 to 2015 which was the lowest point of the time series. The fishery abundance index decreased 12% from 2014 to 2015 and is the time series low (the 2016 data are not available yet). There was no Gulf of Alaska (GOA) trawl survey in 2016. Spawning biomass is projected to decrease slightly from 2017 to 2019, and then stabilize.

Sablefish are managed under Tier 3 of NPFMC harvest rules. Reference points are calculated using recruitments from 1977-2013. The updated point estimates of *B40%, F40%,* and *F35%* from the 2016 federal assessment are 105,836 t (combined across the EBS, AI, and GOA), 0.094, and 0.113, respectively. Projected female spawning biomass (combined areas) for 2017 is 91,553 t (87% of *B40%*, or *B35%*), placing sablefish in sub-tier "b" of Tier 3. The maximum permissible value of *FABC* under Tier 3b is 0.081, which translates into a 2017 ABC (combined areas) of 13,509 t. The OFL fishing mortality rate is 0.097 which translates into a 2017 OFL (combined areas) of 15,931 t. If the stock were in Tier 3a (above the *B40%* reference point), the 2017 ABC would be 15,745 t.

Model projections indicate that this stock is not subject to overfishing, overfished, nor approaching an overfished condition. The maximum permissible ABC for 2017 is 15% higher than the 2016 ABC of 11,795 t. The 2015 assessment projected a 9% decrease in ABC for 2017 from 2016. The SAFE authors recommended a lower ABC than maximum permissible based on newly available estimates of whale depredation occurring in the fishery. Because the including of inflated survey abundance indices as a result of correcting for sperm whale depredation, this decrement is needed in conjunction to appropriately account for depredation on both the survey and in the fishery. This ABC is still 11% higher than the 2016 ABC.

This relatively large increase is supported by a substantial increase in the domestic longline survey index time series that offset the small decrease in the fishery abundance index seen in 2015. The fishery abundance index has been trending down since 2007. The International Pacific Halibut Commission (IPHC) GOA sablefish index was not used in the model, but was similar to the longline survey, hitting its time series low in 2015, down 36% from 2014. The 2008 year class showed potential to be large in previous assessments based on patterns in the age and length compositions. This year class is now estimated to be about 30% above average. There are preliminary

[58] http://www.iphc.washington.edu/research/biology/environ.html

indications of a large incoming 2014 year class, which was evident in the 2016 longline survey length compositions. Spawning biomass is projected to decline through 2019, and then is expected to increase assuming average recruitment is achieved in the future. Maximum permissible ABCs are projected to slowly increase to 13,688 t in 2018 and 14,361 t in 2019.

Projected 2017 spawning biomass is 35% of unfished spawning biomass. Spawning biomass had increased from a low of 33% of unfished biomass in 2001 to 42% in 2009 and has now stabilized near 35% of unfished biomass projected for 2017. The 1997 year class has been an important contributor to the population; however, it has been reduced and is predicted to comprise 5% of the 2017 spawning biomass. The last two above-average year classes, 2000 and 2008, each comprise 13% and 15% of the projected 2017 spawning biomass. The 2008 year class will be about 85% mature in 2017.

Ecosystem considerations for Alaska sablefish are available from the yearly SAFE and are summarized below (Table 8).

Table 8: Ecosystem consideration - 2015 assessment of Sablefish stock. (Source: Dana et al 2016)

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

The State of Alaska conducts monitoring activities in 2016, sablefish longline surveys were conducted for both the NSEI and SSEI areas. These surveys are designed to measure trends in relative abundance and biological

characteristics of the sablefish population. Biological data collected in these surveys include length, weight, sex and maturity stage.

The survey CPUE for NSEI increased in 2016 by 10.3% for individuals per hook and 4.5% round pounds per hook relative to 2015. In the SSEI stock assessment, analyses revealed a 19% increase in the overall longline survey CPUE index (round lb/hook) from 2015 to 2016. Proportion of immature fish harvested in the commercial longline fishery from 2015 to 2016 decreased from 58% to 48% for females and from 64% to 36% for males. In the commercial pot fishery from 2015 to 2016 proportions of immature fish harvested increased from 45% to 67% for females and from 59% to 67% for males.

ADFG conducted longline surveys for sablefish from 1996 through 2006 in Prince William Sound. Between 1999 and 2005, sablefish were opportunistically tagged in PWS on ADFG trawl surveys. Sablefish tagging surveys were conducted in PWS in 2011, 2013, and 2015 using pot longline gear. There were 1,203, 318, and 26 fish tagged in 2011, 2013, and 2015, respectively. CPUE was very low in 2013 with an average of 0.11 fish per pot. To date, 302 fish have been recaptured from the 2011 survey and 41 were captured from the 2013 survey. Of all tagged releases, 65% have been recaptured within PWS and 25% outside in the GOA with the remainder of unknown location. There is no PWS sablefish tagging survey planned for 2017. Short-terms goals are to determine whether the portion of the GOA sablefish stock that resides in and used PWS is well- or poorly-mixed with the larger GOA population. If well-mixed, there would be no need for a PWS sablefish stock assessment as the Federal assessment could be used to apportion catch for the PWS sablefish fishery. If poorly-mixed, there would be a need to conduct more tagging work in PWS to provide an assessment of the abundance within those waters from which to set harvest limits and manage the fishery.

5.3. Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.

Evidence:

The only two nations involved in the sablefish fishery in the eastern North Pacific are Canada and the United States of America. The resources in each nation's waters are managed separately, and each nation conducts surveys that occur in adjacent geographical areas, as well as a survey conducted by IPHC that covers areas in the EEZs of both countries. Japan and USA conducted cooperative longline surveys from 1978 to 1994 and these data are used in the current stock assessment. There is cooperation on various aspects of research, stock assessment, and management between the fisheries agencies (e.g. DFO and NMFS) of USA and Canada[59].

5.4. The fishery management organizations shall directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment and status of trans-boundary aquatic stocks.

Evidence

The main transboundary issues for the Alaskan sablefish stock are between Canada and USA. Both countries have extensive scientific programs for research and assessment, and collaborate on numerous topics related to sablefish science and management. Data from the DFO sablefish surveys in B.C. waters are considered in the

[59] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

NMFS/NPFMC assessment process and SAFE document. The estimated biomass trend in B.C. is similar to the trend in Alaska (see figure below). The similarly low abundance south of Alaska concerns DFO, and points to the need to better understand the contribution to Alaska sablefish productivity from B.C. sablefish. Some potential ideas are to conduct an area-wide study of sablefish tag recoveries, and to attempt to model the population to include B.C. sablefish and U.S. West Coast sablefish[60].

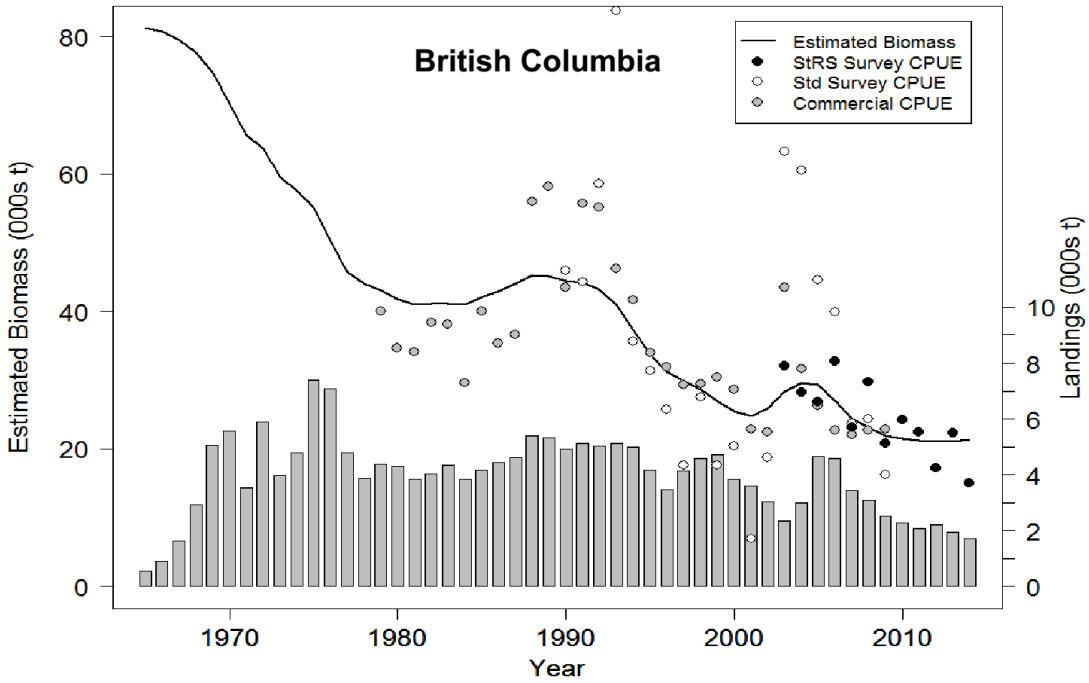


Figure 1: Sablefish abundance and CPUE estimaes-2016. (Source: https://www.afsc.noaa.gov/ABL/MESA/mesa_sa_sable_ss.htm)

5.5. Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

Evidence

Data collected by scientific surveys and sablefish fisheries are analyzed and presented in peer reviewed meetings and in primary literature, following rigorous scientific protocols. These have been described extensively in previous Clauses. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on NMFS, ADFG, and NPFMC websites, in order to contribute higher transparency to fisheries conservation and management. Confidentiality of individuals or individual vessels (e.g. in the analysis of fishery CPUE data) is fully respected where necessary. By Alaska Statute (16.05.815 Confidential Nature of Certain Reports and Records)[61], except for certain circumstances, all records obtained by the state concerning the landing of fish, shellfish, or fishery products and annual statistical reports of fishermen, buyers, and processors may not be released. To ensure confidentiality, fishery data are routinely redacted from ADFG reports if the data for a time/area strata were obtained from a small number of participants.

[60] https://www.afsc.noaa.gov/refm/stocks/assessments.htm
[61] http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section815.htm

7.3. Section C. The Precautionary Approach

7.3.1. Fundamental Clause 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.

Number of Supporting clauses	**4**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized Evidence:

6.1/6.2/6.3/6.4 States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), shall measure the status of the stock against these reference points and agree to actions to be undertaken if reference points are exceeded.

Evidence

No significant change has occurred since the full assessment final report in January 2017. 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[62] specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Limit (OFL) for each stock in the complex (usually individual species but sometimes species groups). The sablefish stock in Alaska is managed under Tier 3. More information is provided in the following sections.

New data utilized in the 2016 assessment model, included;

- relative abundance and length data from the 2016 longline survey,
- relative abundance and length data from the 2015 longline fishery,
- length data from the 2015 trawl fisheries,
- age data from the 2015 longline survey and 2015 fixed gear fishery, and
- updated catch for 2015, and projected 2016 - 2018 catches.

In addition to these usual new data updates, the following substantive new changes were made to the data inputs:
1) New analytical variance calculations for the domestic longline survey abundance index
2) New area sizes for the domestic longline survey abundance index
3) Domestic longline survey estimates corrected for sperm whale depredation
4) Estimates of killer and sperm whale depredation in the fishery

Changes in the assessment methodology:

The 2016 Center for Independent Experts (CIE) review panel had a number of recommendations to improve aspects of the reference model. The 2016 SAFE Report presented the reference model and seven

[62] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

alternatives that sequentially address some of the key recommendations made by the panel. The first five alternative models address the data inputs described above. The first two of these alternatives were considered to be minor model changes (incorporating the area sizes and variance estimates for the domestic longline survey). The next three incorporated corrections of the domestic longline survey and longline fishery for whale depredation, which was considered to be a benchmark change that was recommended by the CIE. The final two models address the CIE panel's concern that the model provided "overly precise" estimates of management quantities. These models reweight the abundance indices relative to obtaining a standard deviation of normalized residuals of one for the domestic longline survey abundance index, while maintaining a value of one for the previously tuned age and length compositions. These two models increase the uncertainty around estimates of spawning biomass and other key management results. Finally, the recommended model estimates natural mortality with a prior distribution, which further propagates uncertainty. In addition, the recommended model has the best retrospective performance of all models considered. The sablefish population is assessed with an age-structured model.

The analysis presented in the 2016 SAFE extends earlier age structured models developed by Kimura (1990) and Sigler (1999), which all stem from the work by Fournier and Archibald (1982). The current model configuration follows a more complex version of the GOA Pacific ocean perch model (Hanselman et al. 2005a); it includes split sexes and many more data sources 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 ("Moonwater", Hanselman et al. 2010). The analysis was completed using AD Model Builder software, a C++ based software for development and fitting of general nonlinear statistical models (Fournier et al. 2012).

Sablefish are managed under Tier 3 of NPFMC harvest rules. Reference points are calculated using recruitments from 1977-2013. The updated point estimates of *B40%, F40%,* and *F35%* from the 2016 federal assessment are 105,836 t (combined across the EBS, AI, and GOA), 0.094, and 0.113, respectively (Table 9). Projected female spawning biomass (combined areas) for 2017 is 91,553 t (87% of *B40%*, or *B35%*), placing sablefish in sub-tier "b" of Tier 3. The maximum permissible value of *FABC* under Tier 3b is 0.081, which translates into a 2017 ABC (combined areas) of 13,509 t. The OFL fishing mortality rate is 0.097 which translates into a 2017 OFL (combined areas) of 15,931 t. If the stock were in Tier 3a (above the *B40%* reference point), the 2017 ABC would be 15,745 t.

Table 9: Sablefish stock update 2016-2017. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf).

Quantity/Status	As estimated or specified *last* year for: 2016	2017	As estimated or recommended *this* year for: 2017*	2018*
M (natural mortality rate)	0.1	0.1	0.097	0.097
Tier	3b	3b	3b	3b
Projected total (age 2+) biomass (t)	204,796	214,552	239,244	249,252
Projected female spawning biomass (t)	86,471	81,986	91,553	89,601
$B_{100\%}$	257,018	257,018	264,590	264,590
$B_{40\%}$	102,807	102,807	105,836	105,836
$B_{35\%}$	89,956	89,956	92,606	92,606
F_{OFL}	0.093	0.086	0.097	0.097
$maxF_{ABC}$	0.078	0.073	0.081	0.078
F_{ABC}	0.078	0.073	0.078	0.076
OFL (t)	13,937	12,747	15,931	16,145
max ABC (t)	11,795	10,782	13,509	13,688
ABC (t)	11,795	10,782	13,083	13,256
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
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 10,348 t and 10,142 t used in place of maximum permissible ABC for 2017 and 2018. This was done in response to management requests for a more accurate two-year projection.

Model projections indicate that this stock is not subject to overfishing, overfished, nor approaching an overfished condition. The maximum permissible ABC for 2017 is 15% higher than the 2016 ABC of 11,795 t. The 2015 assessment projected a 9% decrease in ABC for 2017 from 2016. The SAFE authors recommended a lower ABC than maximum permissible based on newly available estimates of whale depredation occurring in the fishery. Because the including of inflated survey abundance indices as a result of correcting for sperm whale depredation, this decrement is needed in conjunction to appropriately account for depredation on both the survey and in the fishery. This ABC is still 11% higher than the 2016 ABC.

This relatively large increase is supported by a substantial increase in the domestic longline survey index time series that offset the small decrease in the fishery abundance index seen in 2015. The fishery abundance index has been trending down since 2007. The International Pacific Halibut Commission (IPHC) GOA sablefish index was not used in the model, but was similar to the longline survey, hitting its time series low in 2015, down 36% from 2014. The 2008 year class showed potential to be large in previous assessments based on patterns in the age and length compositions. This year class is now estimated to be about 30% above average. There are preliminary indications of a large incoming 2014 year class, which was evident in the 2016 longline survey length compositions. Spawning biomass is projected to decline through 2019, and then is expected to increase assuming average recruitment is achieved in the future. Maximum permissible ABCs are projected to slowly increase to 13,688 t in 2018 and 14,361 t in 2019.

Projected 2017 spawning biomass is 35% of unfished spawning biomass. The limit reference point is B17.5. Spawning biomass had increased from a low of 33% of unfished biomass in 2001 to 42% in 2009 and has now stabilized near 35% of unfished biomass projected for 2017. The 1997 year class has been an important contributor

to the population; however, it has been reduced and is predicted to comprise 5% of the 2017 spawning biomass. The last two above-average year classes, 2000 and 2008, each comprise 13% and 15% of the projected 2017 spawning biomass. The 2008 year class will be about 85% mature in 2017.

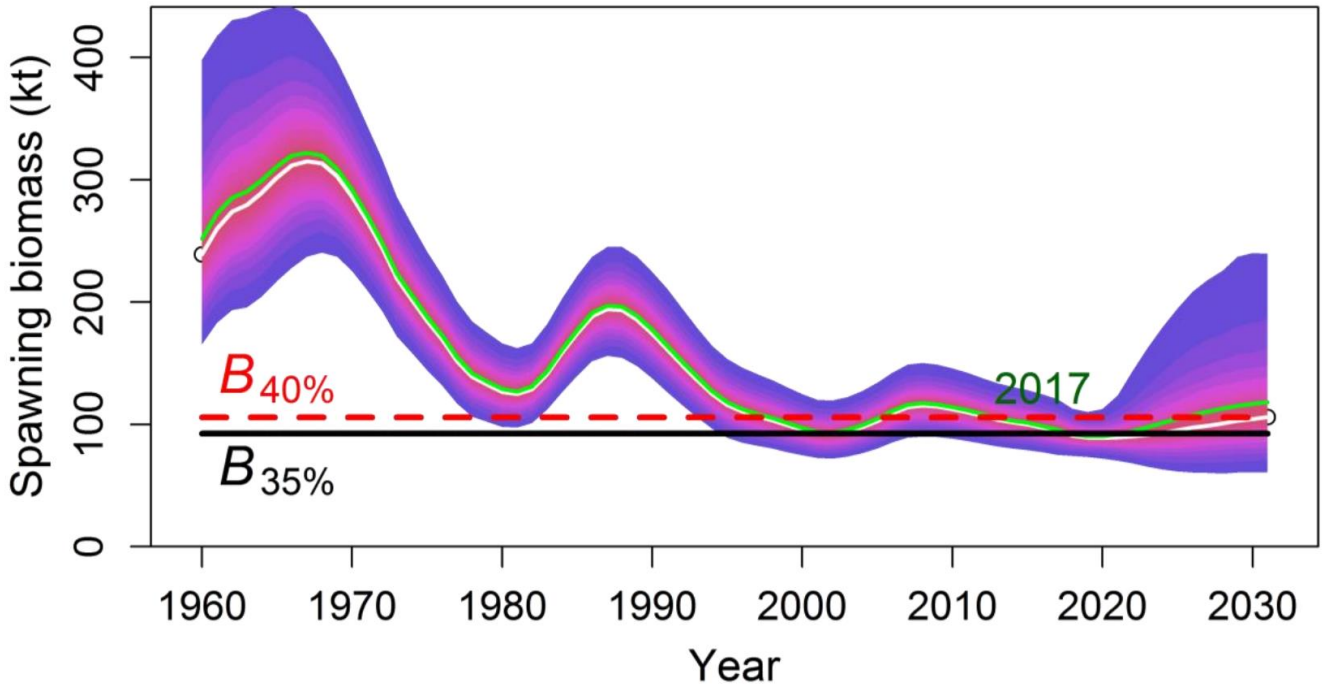


Figure 2: Projected spawning biomass for sablefish. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf)

In Figure 2, an updated estimates of female spawning biomass (thousands t) and their uncertainty is provided. The white line is the median and green line is the mean, shaded fills are 5% increments of the posterior probability distribution of spawning biomass based on MCMC simulations. Width of shaded area is the 95% credibility interval. Harvest policy is the same as the projections in Scenario 2 (Author's F).

The current harvest control rule would allow catches to decrease sequentially as the stock drops between targets and limit reference point and stop if the stock was to reach the limit reference point (B17.5). Confidence with regards to the probabilities of the fishery operating around the stated reference points is provided in Figure 3.

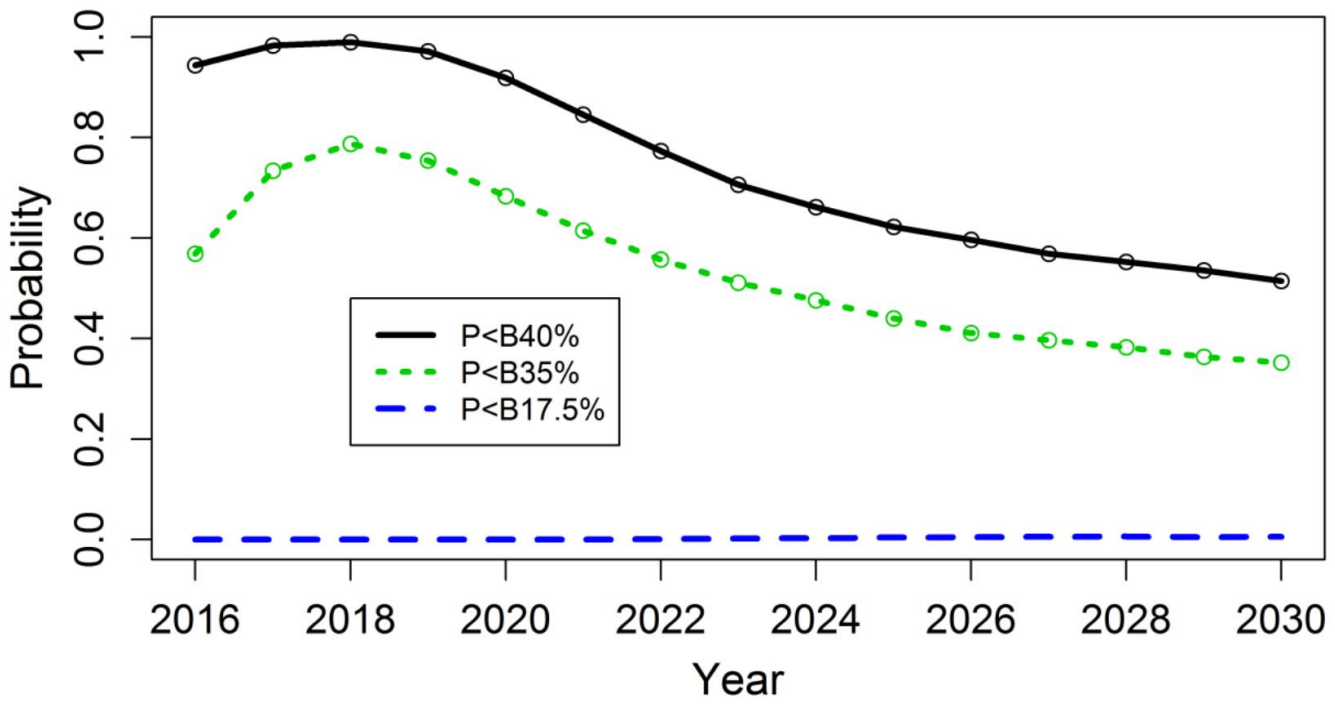


Figure 3: Probability that projected spawning biomass (from MCMC) will fall below B40%, B35% and B17.5. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf)

State fisheries

In Southeast, ADFG is using mark-recapture methods with external tags and fin clips to estimate abundance and exploitation rates for sablefish in the NSEI Sub-district. Sablefish are captured with pot gear in May or June, marked with a tag and a fin clip then released. Tags are recovered from the fishery and fish are counted at the processing plants and observed for finclips. The 2016 recommended ABC of 366 mt for the NSEI fishery was calculated by applying the 2015 fishery mortality at age (based on a harvest rate of 6.8% using the *F*50% biological reference point (BRP)) to the 2016 forecast of total biomass at age and summing across all ages. The 2016 ABC was 18.2% decrease from the 2015 ABC (447mt), which was also based on the *F*50% BRP (the harvest rate was 7.1% for 2015). Since 2009 BRPs have become more conservative, i.e. *F*45% in 2009 and *F*50% since 2010. In addition to the mark-recapture work, an annual longline survey is conducted in NSEI to provide biological data as well as relative abundance information. In SSEI only an annual longline survey is conducted to provide biological data as well as relative abundance information. Unlike NSEI, the department does not currently estimate the absolute abundance of SSEI sablefish. There appears to be substantial movement of sablefish in and out of the SSEI area, which violates the assumption of a closed population; consequently, Peterson mark recapture estimates of abundance or exploitation rates are not possible for this fishery. Instead, the SSEI sablefish population is managed based on relative abundance trends from survey and fishery CPUE data, as well as with survey and fishery biological data that are used to describe the age and size structure of the population and detect recruitment events.

Central Region, ADFG conducted longline surveys for sablefish from 1996 through 2006 in Prince William Sound. Longline survey effort was extended into the North Gulf District in 1999, 2000 and 2002. All longline surveys were discontinued due to lack of funding, and with the goal of transitioning to a pot longline survey, particularly in PWS.

Between 1999 and 2005, sablefish were opportunistically tagged in PWS on ADF&G trawl surveys. Sablefish tagging surveys were conducted in PWS in 2011, 2013, and 2015 using pot longline gear. There were 1,203, 318, and 26 fish tagged in 2011, 2013, and 2015, respectively. CPUE was very low in 2013 with an average of 0.11 fish per pot. To date, 302 fish have been recaptured from the 2011 survey and 41 were captured from the 2013 survey. Of all tagged releases, 65% have been recaptured within PWS and 25% outside in the GOA with the remainder of unknown location. There is no PWS sablefish tagging survey planned for 2017. Short-terms goals are to determine whether the portion of the GOA sablefish stock that resides in and used PWS is well- or poorly-mixed with the larger GOA population. If well-mixed, there would be no need for a PWS sablefish stock assessment as the Federal assessment could be used to apportion catch for the PWS sablefish fishery. If poorly-mixed, there would be a need to conduct more tagging work in PWS to provide an assessment of the abundance within those waters from which to set harvest limits and manage the fishery.[63]

The department will continue to conduct more sablefish tagging as funding allows, and work towards addressing the mixing question via tag-recapture analysis. If data results indicate that a PWS assessment needs to be conducted, the department would continue its tagging study potentially in combination with an age-structured model to accomplish the goal of providing information with which to best manage the fishery. With such small catches in the recent survey and the reduction in funding to continue this work, a request will be made for biometric support for analysis of all Central Region sablefish data. Skipper interviews and biological sampling occurred in Cordova, Whittier, and Seward for the PWS Area commercial fishery and in Seward and Homer for the Cook Inlet Area fishery. After PWS sampling goals were not achieved in 2015, due to extremely low effort and poor fishery performance, staff endeavored in 2016 to ensure sampling goals for sablefish were achieved. Expanded interviews were also conducted with PWS fishermen to collect additional information on fishery dynamics. Data obtained included date and location of harvest, length, weight, sex, and gonad condition. Otoliths were removed and sent to the Age Determination Unit. Logbooks are required for both fisheries and provide catch and effort data by date and location.

[63] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf

7.3.2. Fundamental Clause 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.

Number of Supporting clauses	**5**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized Evidence:

7.1. The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment.

Evidence

No significant change has occurred since the full assessment final report in January 2017. 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.

National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. The status of US fish stocks is determined by 2 metrics. The first is the relationship between the actual exploitation level and the overfishing level (OFL). If the exploitation level (or fishing mortality) exceeds the FOFL, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the minimum stock size threshold (MSST). If the stock size is below the MSST it is considered to be overfished. A stock is considered to be approaching an overfished condition when it is projected that there is more than a 50% chance that the biomass of the stock or stock complex will decline below the MSST within 2 years.

Harvest specifications are made annually by NPFMC, and include the overfishing limit, acceptable biological catch (ABC), and total allowable catch (TAC). The NPFMC management plans classify each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. The Tier system specifies the maximum permissible ABC and the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The BSAI and GOA groundfish fishery management plans[64][65] have pre-defined harvest control rules that define a series of target and limit reference points for sablefish and other groundfish covered by these plans. The overall objectives of the management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering as well as addressing the differing levels of uncertainty.

[64] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[65] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BASI/BSAIfmp.pdf

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. Most of the larger and commercially important stocks under NPFMC management, including sablefish, are in Tier 3, which has sufficient information to determine surrogates for MSY-based reference points. The term "*FX%*" refers to the fishing mortality rate (*F*) associated with an equilibrium level of spawning per recruit equal to *X%* of the equilibrium level of spawning per recruit in the absence of any fishing. For tier 3, the term *B40%* refers to the long-term average biomass that would be expected under average recruitment and *F=F40%*. For Tier 3 stocks such as sablefish, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence The MSY proxy level is defined as B35% and the MSST level is one-half of B35%. The conservative nature of the harvest control measure relative to sablefish is shown in Table 10.

Table 10: Relevant Sablefish Harvest Control and conservation measures. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf)

Area	Year	Biomass (4+)	OFL	ABC	TAC	Catch
GOA	2015	130,000	12,425	10,522	10,522	10,330
	2016	122,000	10,326	9,087	9,087	8,886
	2017	139,000	12,279	10,074		
	2018	141,000	12,444	10,207		
BS	2015	34,000	1,574	1,333	1,333	210
	2016	25,000	1,304	1,151	1,151	417
	2017	24,000	1,551	1,274		
	2018	24,000	1,572	1,291		
AI	2015	24,000	2,128	1,802	1,802	430
	2016	23,000	1,766	1,557	1,557	319
	2017	43,000	2,101	1,735		
	2018	44,000	2,129	1,758		

Projected 2017 spawning biomass is 35% of unfished spawning biomass (corresponding to target reference point). The limit reference point is B17.5.

The state fisheries for sablefish are considered equally precautionary.

In the Southeast Region the 2016 NSEI sablefish fishery opened August 15 and closed November 15. The 78 permit holders landed a total of 293 mt of sablefish. The fishery is managed by equal quota share; each permit holder was allowed 3.8 mt. In the NSEI fishery, the overall CPUE (adjusted for hook spacing expressed in round lb/hook) increased 14.9% in 2016. The 2016 SSEI sablefish fishery season was June 1–August 15 for longline gear and September 1–November 15 for pot gear. In SSEI, 20 permits were designated to be fished with longline gear and 3 permits for pot gear. Twenty-three permit holders landed a total of 216 mt of sablefish, each with an equal quota share of 9.5 mt. SSEI longline fishery CPUE has remained fairly stable in the last four years (0.30–0.33 lb/hook from 2012–2015).

In the Central Region, the 2016 Cook Inlet Area sablefish fishery opened at noon July 15 with a GHL of 21.8 mt and closed by emergency order on November 8 when the GHL was achieved. The 2016 PWS sablefish fishery opened

April 15 with a GHL of 50.3 mt and closed by regulation on August 31. PWS sablefish harvest totaled 18.4 mt, up from the 7.7 mt historical low in 2015, although still the second lowest harvest on record and less than 20% of the historical average.

Within the Westward Region, only the Aleutian Islands have sufficient habitat to support mature sablefish populations of enough magnitude to permit commercial fishing. All other sections within the region are closed by regulation to avoid the potential for localized depletion from the small amounts of habitat within the jurisdiction of the state. Bycatch from the areas closed to directed fishing is limited to 1%. The 2016 Aleutian Island fishery opened on March 11 with only pot, longline, jig and hand troll gear allowed. Additional requirements for the fishery include registration and logbook requirements. The GHL was set at 135 mt for the state-waters fishery. The harvest from the 2016 Aleutian Islands sablefish fishery was 35 mt. The season remained open until the November 7 closure date.

7.2. For new and exploratory fisheries, procedures shall be in place for promptly applying precautionary management measures, including catch or effort limits.

Not applicable. The sablefish fisheries in Alaska are considered well developed.

7.4. Section D. Management Measures

7.4.1. Fundamental Clause 8

Management shall adopt and implement effective management measures designed to maintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable utilization of the fishery and be based upon verifiable evidence and advice from available scientific and objective, traditional sources.

Number of Supporting clauses	**17**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

8.1. Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.

Evidence

The Magnuson-Stevens Fishery Conservation and Management Act (MSA)[66] is the primary domestic legislation governing management of US marine fisheries. The act establishes MSY as the basis for fishery management and requires that: the fishing mortality rate does not jeopardize the capacity of a stock or stock complex to produce MSY; the abundance of an overfished stock or stock complex is rebuilt to a level that is capable of producing MSY; and OY not exceed MSY. NPFMC, FMPs[67][68] for GOA and BSAI Regions 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 Magnuson-Stevens Act (MSA) sets out ten national standards for fishery conservation and management, 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, and they include preventing overfishing, promoting sustainable fisheries and communities, and promoting equitable and efficient use of fishery resources. The approach used by NPFMC for sablefish includes the best scientific advice available, and decisions are based on a precautionary approach which includes harvest control rules.

In state waters (0-3 nm), five sablefish state fisheries are managed by the ADFG and the BOF outside the IFQ program. 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. 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.

[66] http://www.nmfs.noaa.gov/sfa/magact/
[67] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[68] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BASI/BSAIfmp.pdf

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.

The federal sablefish fishery is managed under an Individual Fishing Quota system. Influential management actions regarding sablefish include:

Management units

Sablefish are assessed as a single population in Federal waters off Alaska because of their high movement rates. Sablefish are managed by discrete regions to distribute exploitation throughout their wide geographical range. There are four management areas in the GOA: Western, Central, West Yakutat, and East Yakutat/Southeast Outside; and two management areas in the Bering Sea/Aleutian Islands (BSAI): the BS and the AI regions. Amendment 8 to the GOA Fishery Management Plan established the West and East Yakutat management areas for sablefish, effective 1980.

Quota allocation

Amendment 14 to the GOA Fishery Management Plan allocated the sablefish quota by gear type: 80% to fixed gear (including pots) and 20% to trawl in the Western and Central GOA, and 95% to fixed gear and 5% to trawl in the Eastern GOA, effective 1985. Amendment 15 to the BS/AI Fishery Management Plan, allocated the sablefish quota by gear type, 50% to fixed gear and 50% to trawl in the eastern BS, and 75% to fixed gear and 25% to trawl gear in the Aleutians, effective 1990.

IFQ management

Amendment 20 to the GOA Fishery Management Plan and 15 to the BS/AI Fishery Management Plan established IFQ management for sablefish beginning in 1995. These amendments also allocated 20% of the fixed gear allocation of sablefish to a CDQ reserve for the BS and AI.

Maximum retainable allowances

Maximum retainable allowances (MRA) for sablefish as the “incidental catch species” were revised in the GOA by a regulatory amendment, effective April, 1997. The percentage depends on the basis species: 1% for pollock, Pacific cod, Atka mackerel, “other species”, and aggregated amount of non-groundfish species. Fisheries targeting deep flatfish, rex sole, flathead sole, shallow flatfish, Pacific ocean perch, northern rockfish, dusky rockfish, and demersal shelf rockfish in the Southeast Outside district, and thornyheads are allowed 7%. The MRA for arrowtooth flounder changed effective 2009 in the GOA, to 1% for sablefish as the basis species.

Allowable gear

Amendment 14 to the GOA Fishery Management Plan banned the use of pots for fishing for sablefish in the GOA, effective 18 November 1985, starting in the Eastern area in 1986, in the Central area in 1987, and in the Western area in 1989. An earlier regulatory amendment was approved in 1985 for 3 months (27 March - 25 June 1985) until Amendment 14 was effective. A later regulatory amendment in 1992 prohibited longline pot gear in the BS (57 FR 37906). The prohibition on sablefish longline pot gear use was removed for the BS, except from 1 to 30 June to prevent gear conflicts with trawlers during that month, effective 12 September 1996. Sablefish longline

pot gear is allowed in the AI. In April of 2015 the NPFMC passed a motion to again allow for sablefish pot fishing in the GOA in response to increased sperm whale depredation. The final motion was passed and the final regulations are expected in early 2017. The development of this gear type in the Gulf of Alaska will be fully monitored.

8.2. States shall prohibit dynamiting, poisoning and other comparable destructive fishing practices.

Evidence

As listed in the NPFMC, FMPs and NMFS regulations, the only legal gears for taking sablefish in the Alaskan fisheries are hook and line, pot, jig, and trawl. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such gears are being used illegally.

8.3. States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery.

Evidence

The NPFMC is responsible for allocation of the sablefish resource among user groups in Alaska waters. In addition, the Alaskan Board of Fisheries (BOF) public meetings process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities that catch sablefish off Alaska to participate in the development of legal regulations for fisheries.

The NPFMC established a Rural Outreach Committee in 2009 to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. The Committee is to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; to provide feedback on community impacts sections of specific analyses, if requested; and to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. Initial priorities of the Committee included salmon PSC reduction[69].

The Western Alaska Community Development Quota (CDQ)[70] Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. The CDQ Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. There are approximately 65 communities within a fifty-mile radius of the BS coastline who participate in the program.

Advisory Committees (AC) are local “grass roots” citizen groups intended to provide a local voice for the collection

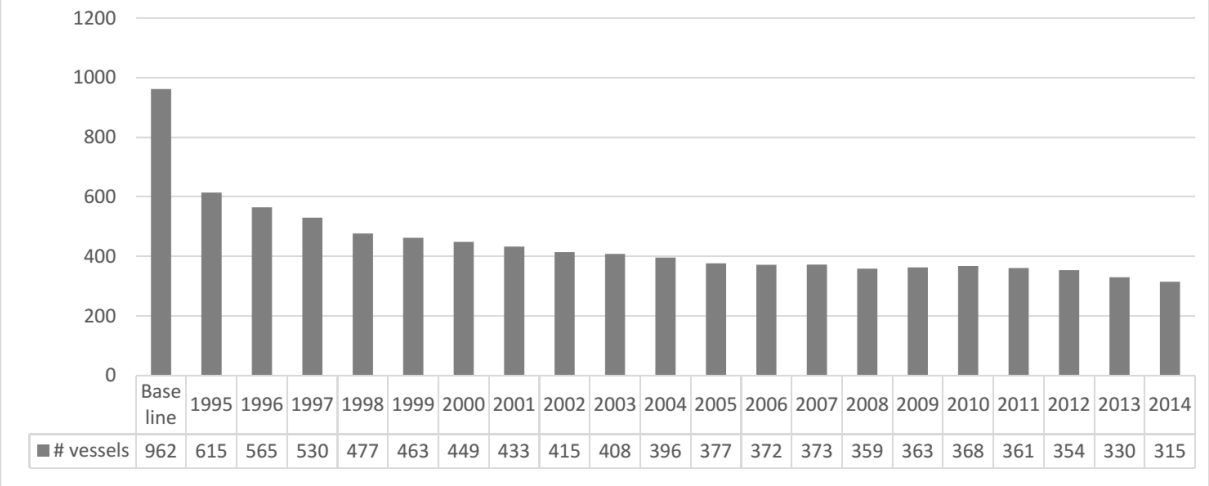
[69] http://www.npfmc.org/committees/rural-outreach-committee/
[70] http://www.npfmc.org/community-development-program/

and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADF&G staff regularly attends the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 84 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BOF meetings. The enabling statute for the AC system is AS 16.05.260. Regulations governing the ACs are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97[71].

8.4. Mechanisms shall be established where excess capacity exists, to reduce capacity. Fleet capacity operating in the fishery shall be measured. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

Evidence

The sablefish fishery in Alaska is a closed access fishery managed using an IFQ system. The same is true for all but one minor state fishery. Vessels participating in the fleet have decreased since implementation of the IFQ program in 1993[72]. Annually, NMFS issues eligible QS holders an IFQ fishing permit that authorizes participation in the IFQ fisheries. Those to whom IFQ permits are issued may harvest their annual allocation at any time during the eight plus-month IFQ halibut and sablefish seasons. The IFQ program is a complex management program authorized by federal regulations, which, along with the various definitions required can be viewed on a NOAA website[73] .



	Base line	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
# vessels	962	615	565	530	477	463	449	433	415	408	396	377	372	373	359	363	368	361	354	330	315

Source: RAM IFQ landings database sourced through AKFIN. The baseline represents an average of the 1992 through 1994 values from ADF&G Fish Tickets.

Figure 4: Number of active vessels in the sablefish IFQ fishery. (Source: https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf)

8.5. Technical measures shall be taken into account, where appropriate, in relation to: fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, protection of juveniles or

[71] http://www.boards.ADF&G.state.ak.us/bbs/what/prps.php
[72] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
[73] https://alaskafisheries.noaa.gov/fisheries-679regs

spawners.

Evidence

A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs (as an example see Table 11 below for those measures relevant to sablefish in the GOA FMP[74]). These also cover legal definitions such as quota shares, IFQ's, etc. The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website[75]. These regulations cover all aspect of fishing, including seasons, gear limitations, and numerous area closures. There are specific rules laid out for sablefish, permitting the use of trawl gear only in certain areas, as well as regulations on seabird avoidance for vessels fishing with hook-and-line gear. The gear regulations also contain details on mesh sizes permitted, biodegradable panels in pot gears, types of hook and line gear allowed, etc. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round. Fishing with trawl vessels is not permitted year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area. As well, a number of closure zones for trawl gears are described in the NPFMC FMPs for GOA and BSAI.

GOA Management measures relevant to sablefish

Table 11: Gulf of Alaska Sablefish management measures. (Source: http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf)

Optimum Yield (OY) and Maximum Sustainable Yield (MSY)	The OY of the GOA groundfish complex (consisting of stocks listed in the 'target species' category, as listed in Table 3-1) is in the range of 116,000 to 800,000 mt. The upper end of the range is derived from historical estimates of MSY.
Procedure to set Total Allowable Catch (TAC)	Based on the annual Stock Assessment and Fishery Evaluation (SAFE) report, the Council will recommend to the Secretary of Commerce TACs and apportionments thereof for each target species. Up to two years of TACs may be established for certain species. **Reserve:** 20% of the TAC for pollock, Pacific cod, flatfish, sculpins, octopus, sharks, and squid is set aside to form the reserve, which may be reapportioned to these fisheries at any time and in any amount by the Regional Administrator.
Apportionment of TAC	Harvest allocations and management are based on the calendar year. TACs are apportioned by regulatory area, and by district for some stocks. Areas or districts may also be managed together. **Sablefish:** the Eastern regulatory area is divided into two districts, West Yakutat and Southeast Outside. In the Eastern regulatory area, vessels using hook-and-line gear will be permitted to take up to 95% of the TAC, and vessels using trawl gear up to 5%. In the Western and Central regulatory areas, vessels using hook-and-line gear will be permitted to take up to 80% of the TAC, and vessels using trawl gear up to 20%.
Attainment of TAC	The attainment of a TAC for a species will result in the closure of the target fishery for that species. Further retention of that species will be prohibited.
Permit	All vessels participating in the GOA groundfish fisheries, other than fixed gear sablefish and demersal shelf rockfish in Southeast Outside district, require a Federal groundfish license, except for: vessels fishing in State of Alaska waters and vessels less than or equal to 26' LOA. Licenses are endorsed with area, gear, and vessel type and length designations. Fishing permits may be authorized, for limited experimental purposes, for the target or incidental harvest of groundfish that would otherwise be prohibited.

[74] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[75] https://alaskafisheries.noaa.gov/fisheries-679regs

Authorized Gear	Gear types authorized by the FMP are trawls, hook-and-line, pots, jigs, and other gear as defined in regulations. **Sablefish:** Legal gear for taking sablefish in the GOA is hook and line and trawl gear.
Time and Area Restrictions	**Fishing Year:** January 1-December 31. **All vessels:** Fishing or anchoring within the Sitka Pinnacles Marine Reserve is prohibited at all times[76]. **All trawl:** Use of trawl gear is prohibited at all times in the Southeast Outside district. **Non-pelagic** trawl: The use of non-pelagic trawl is prohibited in Cook Inlet. Three types of king crab protection areas are designated around Kodiak Island. Type I areas prohibit non-pelagic trawling year-round; and Type II areas prohibit non-pelagic trawling from February 15 to June 15; and 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. Trawling in the Marmot Bay Tanner Crab Protection Area is prohibited year-round, except for pelagic trawl gear used to directed fish for pollock. **Bottom contact gear:** The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round. **Anchoring:** Anchoring by fishing vessels in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas is prohibited. **Marine mammal measures:** Regulations implementing the FMP may include conservation measures that temporally and spatially limit fishing effort around areas important to marine mammals. **Gear test area exemption:** Specific gear test areas for use when the fishing grounds are closed to that gear type, are established in regulations that implement the FMP.
Prohibited Species	Pacific halibut, Pacific herring, Pacific salmon, steelhead trout, king crab, and Tanner crab are prohibited species and must be returned to the sea with a minimum of injury except when their retention is authorized by other applicable law. Groundfish species and species under this FMP for which the TAC has been achieved shall be treated in the same manner as prohibited species. **Salmon**: All salmon intercepted in the trawl fisheries in the Western and Central GOA must be retained until an observer is provided the opportunity to count the number of salmon and to collect scientific data or biological samples from the salmon.
Prohibited Species Catch (PSC) Limits	The attainment of a PSC limit for a species will result in the closure of the appropriate fishery. **Pacific halibut:** Halibut mortality PSC limits are established annually in regulation; may be apportioned by season, regulatory area, gear type, operation type, and/or target fishery. **Chinook Salmon:** The annual PSC limit for the pollock trawl fishery in the Central Regulatory Area and adjacent State of Alaska waters is 18,316 Chinook salmon. The annual PSC limit for the pollock trawl fishery in the Western Regulatory Area and adjacent State of Alaska waters is 6,684 Chinook salmon. Attainment of a limit closes the directed pollock trawl fishery in the respective regulatory area. The annual base PSC limit for the catcher/processor sector in the non-pollock trawl fisheries of the Western and Central Regulatory Areas and adjacent State of Alaska waters is 3,600 Chinook salmon; no more than 66% of the annual PSC limit can be taken by the catcher/processor sector before June 1. The annual PSC limit for the catcher vessel sector in the non-pollock trawl fisheries of the Western and Central Regulatory Areas and adjacent State of Alaska waters is 3,900 Chinook salmon; 1,200 of this amount is apportioned to catcher vessels fishing under the authority of Central GOA Rockfish Program cooperative quota permits. Attainment of a limit closes directed non-pollock trawl fishing for the respective sector or season. The catcher/processor sector and catcher vessels not fishing under the

[76] Witherell, D. and D. Woodby. 2005. Application of Marine Protected Areas for Sustainable Production and Marine Biodiversity off Alaska. Marine Fisheries Review 67(1):1-27. http://spo.nmfs.noaa.gov/mfr671/mfr6711.pdf

	authority of a Central GOA Rockfish Program cooperative quota permit in the non-pollock trawl fisheries may receive an amount of Chinook salmon PSC in addition to the sector's annual base PSC limit if the sector achieved a certain standard of Chinook salmon avoidance in the preceding year. Non-pollock trawl catcher vessels not fishing under the authority of a Central GOA Rockfish Program cooperative quota permit may receive a reapportionment of Chinook salmon PSC from Rockfish Program catcher vessels during each year. The Regional Administrator may reapportion Chinook salmon PSC from any of these limits to one of the trawl catcher vessel sectors during a year, based on need for, and availability of, Chinook salmon PSC; the amount of reapportioned Chinook salmon PSC that a sector may receive is limited to 50 percent of that sector's annual Chinook salmon PSC apportionment as defined in Federal regulations.
Fixed Gear Sablefish Fishery	The directed fixed gear sablefish fisheries are managed under an Individual Fishing Quota program. The FMP specifies requirements for the initial allocation of quota share in 1995, as well as transfer, use, ownership, and general provisions. **Annual Allocation:** The ratio of a person's quota share to the quota share pool is multiplied by the fixed gear TAC (adjusted for the community development quota allocation - see below), to arrive at the annual individual fishing quota. **Community Quota Share Purchases:** Specified GOA coastal communities are eligible to hold commercial catcher boat sablefish quota share under the IFQ program.
Flexible Authority	The Regional Administrator of NMFS is authorized to make in-season adjustments through gear modifications, closures, or fishing area/quota restrictions, for conservation reasons, to protect identified habitat problems, or to increase vessel safety.
Recordkeeping and Reporting	Recordkeeping that is necessary and appropriate to determine catch, production, effort, price, and other information necessary for conservation and management may be required. May include the use of catch and/or product logs, product transfer logs, effort logs, or other records as specified in regulations. **At-sea processor vessels:** Catcher/processor vessels and mothership processors vessels may be required to submit check-in and check-out reports for any Federal statistical areas or the U.S. EEZ.
Observer Program	U.S. fishing vessels that catch groundfish in the EEZ, or receive groundfish caught in the EEZ, and shoreside processors that receive groundfish caught in the EEZ, are required to accommodate NMFS-certified observers as specified in regulations, in order to verify catch composition and quantity, including at-sea discards, and collect biological information on marine resources.
Evaluation and Review of the FMP	The Council will maintain a continuing review of the fisheries managed under this FMP, and all critical components of the FMP will be reviewed periodically. **Management Policy:** Objectives in the management policy statement will be reviewed annually. **Essential Fish Habitat (EFH):** The Council will conduct a complete review of EFH once every 5 years, and in between will solicit proposals on Habitat Areas of Particular Concern and/or conservation and enhancement measures to minimize potential adverse effects from fishing. Annually, EFH information will be reviewed in the "Ecosystems Considerations" chapter of the SAFE.

Management of state fisheries

There are three separate internal water areas in Alaska which have state-managed limited-entry commercial sablefish fisheries. **The NSEI and SSEI** (Southeast Region) and the Prince William Sound Inside District (Central Region) each have separate seasons and GHLs.

In the **Cook Inlet Area**, there is a state-managed open access sablefish fishery with a separate GHL. In the Southeast Region both the SSEI and NSEI sablefish fisheries have been managed under a license limitation program since 1984. In 1994 the BOF adopted regulations implementing an equal share quota system where the annual GHL was divided equally between permit holders and the season was extended to allow for a more orderly fishery. In 1997 the BOF adopted this equal share system as a permanent management measure for both the NSEI and SSEI sablefish fisheries. There were 78 permit holders eligible to fish in 2016 in NSEI and 23 permit holders eligible to fish in SSEI. The NSEI quota was set at 366 mt and the SSEI quota was set at 219 mt for 2016.

During the February 2009 BOF meeting, the BOF made no changes affecting the regulation of commercial sablefish fisheries. The BOF did however establish bag and possession limits for sablefish in the sport fishery. At the 2012 BOF meeting, a regulation was passed to require personal use and subsistence use sablefish permits, and at the 2015 BOF meeting, limits were defined for personal use sablefish fisheries for the number of fish, number of permits per vessel, and number of hooks. No changes were made to sablefish subsistence fisheries in 2015.

There is no open-access sablefish fishery in the **Southeast Outside District** as there are limited areas that are deep enough to support sablefish populations inside state waters. In some areas of the Gulf, the state opens the fishery concurrent with the EEZ opening. These fisheries, which occur in Cook Inlet Area's North Gulf District and the Aleutian Island District, are open access in state waters, as the state cannot legally implement IFQ management at this time. The fishery GHLs are based on historic catch averages and closed once these have been reached.

Within the **Central Region the Cook Inlet** Area North Gulf District sablefish GHL is set using an historic baseline harvest level adjusted annually by the relative change to the ABC in the federal CGOA. In 2004, the BOF adopted a sablefish fishery-specific registration, logbook requirement, and 48-hour trip limit of 1.36 mt in the Cook Inlet Area. For PWS, a limited-entry program that included gear restrictions and established vessel size classes was adopted in 1996. Between 1996 and 2014, the PWS fishery GHL was set at 110 mt, which is the midpoint of the harvest range set by a habitat-based estimate. Tagging studies conducted by the National Marine Fisheries Service (NMFS) and ADFG indicate that sablefish populations throughout the Gulf of Alaska (GOA) including the PWS area are likely mixed. Therefore, the GHL was adjusted by applying the relative change each year in the NMFS GOA sablefish acceptable biological catch (ABC), which is derived from NMFS stock assessment surveys. The GHL was adjusted beginning in 2015 by applying the relative change in the GOA-wide ABC for sablefish back to 1994; this adjustment continued in 2016. PWS fishery management developed through access limitation and in 2003 into a shared quota system wherein permit holders are allocated shares of the guideline harvest guideline level. Shares are equal within each of four vessel size classes, but differ between size classes. In 2009, the BOF adopted regulations which included a registration deadline, logbooks, and catch reporting requirements. In 2009, new season dates were also adopted by the BOF for PWS sablefish, April 15 – August 31. The new season opening date, one month later than in previous years, was adopted to reduce the opportunity for orca depredation on hooked sablefish which predominately occurred prior to May 1.

The sole **Westward Region sablefish fishery occurs in the Aleutian Islands**. The GHL for the Aleutian Islands is set at 5% of the combined Bering Sea Aleutian Islands TAC. The state GHL can be adjusted according to recent state-waters harvest history when necessary. From 1995 to 2000 the fishery opened concurrently with the EEZ IFQ sablefish fishery. In 2001 the BOF changed the opening date of the state-waters fishery to May 15 to provide small vessel operators an opportunity to take advantage of potentially better weather conditions. From 1995 to 2000 all legal groundfish gear types were permissible during the fishery. Effective in 2001, longline, pot, jig and hand troll became the only legal gear types. Vessels participating in the fishery are required to fill out logbooks. In 2013, the BOF changed the season opening and closing dates to revert back to coinciding with the federal IFQ season.

The **Southeast Alaska sport fishery** for sablefish was regulated for the first time in 2009. Sport limits in 2016 were four fish of any size per day, four in possession, with an annual limit of eight fish applied to nonresidents only in lower Lynn Canal and Chatham Strait. Creel surveys in Southeast Alaska in 2016 sampled 254 sablefish, reflecting the small harvest relative to other species. The sablefish sport fishery in Southcentral Alaska was unregulated, with no bag, possession, or size limits. Port samplers in Southcentral Alaska measured one sablefish from the sport harvest, again reflecting the relatively small harvests[77].

8.6. Fishing gear shall be marked.

Evidence
Regulations pertaining to vessel and gear markings in the sablefish fishery are established in NMFS regulations, as prescribed in the annual management measures published in the Federal Register[78]. They state:

(a) Marking of hook-and-line, longline pot, and pot-and-line gear.

(1) All hook-and-line, longline pot, and pot-and line marker buoys carried on board or used by any vessel regulated under this part shall be marked with the vessel's Federal fisheries permit number or ADF&G vessel registration number.

(2) Markings shall be in characters at least 4 inches (10.16 cm) in height and 0.5 inch (1.27 cm) in width in a contrasting color visible above the water line and shall be maintained so the markings are clearly visible.

8.7. Measures shall be introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts shall be made to ensure that resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities are restored.

Evidence

Management measures are in place for managing sablefish (see 8.5 and 8.1) in Alaska and the resource is not depleted or threatened with depletion.

The main fishing gear used to capture sablefish is longline, which has relatively low impact on seabed habitat. By-catches are carefully managed, and include PSC limits for several species, including halibut and tanner crab. Federal and state regulations[79],[80] define pot gear for all groundfish (i.e., there is no distinction between pot gear for different species such as Pacific cod or sablefish). Each groundfish pot must comply with a number of specifications, including use of a biodegradable panel, and tunnel openings (rigid or soft) which must not exceed maximum dimensions. When the pots are retrieved, fish are sorted on deck and non-target catch is returned to the sea.

By regulation, there is no directed trawl fishery for sablefish, but they are taken as by-catch in several trawl

[77] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[78] https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf
[79] https://alaskafisheries.noaa.gov/regs/679a2.pdf
[80] http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[JUMP:%275+aac+28!2E050%27]/doc/{@1}?firsthit

fisheries, including rockfish. The bottom trawl gear in the BSAI has been modified (regulation effective January 20th 2011, see Amendment 94 to the BSAI FMP) to have elevating devices (bobbins) which have 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 have been in place governing the configuration of modified non-pelagic trawl gear. This rule requires that non-pelagic 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.[81],[82]

The modifications to non-pelagic trawl gear used in these fisheries will reduce the unobserved injury and mortality of Tanner crab, and will reduce the potential adverse impacts of non-pelagic trawl gear on bottom habitat. Finally, this rule makes a minor technical revision to the modified non-pelagic trawl gear construction regulations to facilitate gear construction for those vessels required to use modified non-pelagic trawl gear in the GOA and Bering Sea groundfish fisheries.

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 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.

8.8/8.9/8.10/8.11/8.12/8.13. States shall encourage the development and implementation of technologies and operational methods that reduce waste and discards and reduce the loss of fishing gear. The implications of the introduction of new fishing gears, methods and operations shall be assessed and the effects of such introductions monitored. New developments shall be made available to all fishers and shall be disseminated and applied appropriately.

Evidence

The groundfish trawl industry in Alaska deploys halibut excluder devices in their gear, reducing the by-catch of halibut, which is treated as a prohibited species catch (PSC) and managed with strict limits. Exempted Fishing Permits (EFPs) have been granted by NMFS to some trawler fleets in Alaskan waters in 2016 to allow halibut deck sorting experiments, with the aim of reducing halibut mortality on fish required under PSC limits to be returned to the sea. The program requires observer coverage and electronic video monitoring on all vessels, and is supported by previous scientific study (Gauvin 2012). An example of an EFP for this fishery can be found here[83].

In certain trawl fisheries in the Bering Sea and the central Gulf of Alaska that take sablefish as by-catch (e.g. some flatfish fisheries), a trawl sweep gear modification has been required by NPFMC[84]. Elevating devices (e.g., discs or bobbins) are required in both the BSAI and the GOA to be used on the trawl sweeps, to raise the sweeps off the

[81] North Pacific Fisheries Management Council Fisheries Management Plans http://www.npfmc.org/fishery-management-plans/

[82] Federal Register Amendment 89 to the Gulf of Alaska Groundfish Fishery Management Plan Area Closures for Chionoecetes bairdi Crab Protection in Gulf of Alaska Groundfish Fisheries https://www.federalregister.gov/regulations/0648-BB76/amendment-89-to-the-gulf-of-alaska-groundfish-fishery-management-plan-area-closures-for-chionoecetes

[83] https://alaskafisheries.noaa.gov/sites/default/files/efp2016-01-050616permit.pdf

[84] http://www.npfmc.org/habitat-protections/gear-modifications/

seabed and limit adverse impacts of trawling on the seafloor.

Groundfish pots (including longline pots) used to catch sablefish and other species in Alaskan waters are required to comply with a number of specifications, including use of a biodegradable panel, and tunnel openings (rigid or soft) which must not exceed maximum dimensions. These gear constructions minimize impacts of ghost fishing and of catch of certain non-target species and sizes.

Vessels fishing longline gear in Alaskan waters (e.g. IFQ sablefish) are required by NMFS regulation[85] to take measures to avoid seabird bycatch. Such measures include the use of streamer lines (Melvin 2000), as well as using hooks that when baited, sink as soon as they are put in the water.

NMFS has a National Bycatch Reduction Strategy[86], which is intended to guide and coordinate efforts to reduce bycatch and bycatch mortality in the coming years. Key areas of focus include:

- monitor and estimate the rates of bycatch and bycatch mortality in fisheries to understand the level of impact and the nature of the interaction;
- research to improve estimates of bycatch rates, better understand the impacts of bycatch on species interactions and community dynamics, modify fishing gear, and develop mitigation tools to minimize bycatch and its impacts;
- develop and implement domestic management measures and promote the adoption and implementation of international measures to address bycatch and its impacts;
- evaluate the effectiveness of science and management programs to determine whether programs achieve stated goals and identify needed improvements;
- enforce fishery management measures and work with state, federal, and international partners to ensure compliance with all applicable laws;
- communicate with agencies and stakeholders to maximize the impact of bycatch reduction efforts.

Bycatch reduction technologies and devices have been developed and are used in active fishing gears in sablefish fisheries in Alaska, as documented above. Other initiatives that have been implemented include supporting the Bycatch Reduction Engineering Program, and implementing and improving observer programs to record at-sea bycatch. In addition, the 2007 MSA reauthorization created new requirements for bycatch minimization, and this National Bycatch Reduction Strategy reflects current efforts and ensures that its programs are aligned with current and emerging priorities.

The performance of various fishing gears is regularly monitored by industry participants, fishery observers, NMFS and ADF&G authorities, and NPFMC. Various by-catch, MRA, and PSC measures, including a variety of gear performance regulations have been introduced in many Alaskan fisheries, and the bycatch of sablefish in trawl fisheries is strictly controlled by MRAs, which are monitored closely. NPFMC focuses on several areas of by-catch reduction which have relevance to sablefish in Alaska, including measures for pots and trawls specifically[87]. They also host and participate in numerous workshops and meetings where bycatch reduction and gear performance are regularly discussed, and often lead to gear modifications and improvements being implemented under NMFS regulation.[88]

[85] https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf.
[86] http://npfmc.legistar.com/gateway.aspx?M=F&ID=a6ea1d59-1038-4f85-89ce-29f3dddafa11.pdf
[87] http://www.npfmc.org/wp-content/PDFdocuments/bycatch/Bycatchflyer913.pdf
[88] http://www.npfmc.org/goa-trawl-bycatch-management/

8.14. Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures.

Not applicable.

7.4.2. Fundamental Clause 9

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

Number of Supporting clauses	**3**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Compliance
Non Conformances	N/A

Summarized evidence:

9.1./9.2./9.3. Education and training programs.

No significant changes has occurred in the management of sablefish fishery in Alaska since the full assessment final report in January 2017. Any aspirant sablefish and halibut fisherman must have 150 days of halibut/sablefish fishing experience before being able to purchase halibut IFQs under NMFS/NOAA rules. Obtaining sablefish IFQ share most often will require the purchaser (aspirant sablefish fisherman) 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[89].

The State of Alaska, Department of Labor and Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training and 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 crewmembers for employment in the Alaskan maritime industry[90]. This 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, and 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 their ship simulator, computer based navigational laboratory, and modern classrooms. The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's maritime industry. 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[91]. In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit (AYFS). AYFS is designed to provide training, information and networking opportunities for commercial fishermen early in their careers.

[89] http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf
[90] http://www.avtec.edu/
[91] http://seagrant.uaf.edu/map/fisheries/

The summit will focus on building leadership and networking capacity in the Alaska commercial fishing industry through three days of intensive training. The fast-paced program features industry leaders providing insights on fishing business management, the fisheries management process, and the role of Alaska seafood in the global marketplace. In 2017, the AYFS will coincide with the North Pacific Fisheries Management Council December meeting in Anchorage.

The Alaska Marine Safety Education Association (AMSEA) provides courses on small boating safety, drill conductor training, stability and damage control, ergonomics and survival at sea training[92].

[92] http://www.amsea.org/commercial-fishermen

7.5. Section E. Implementation, Monitoring and Control

7.5.1. Fundamental Clause 10

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.

Number of Supporting clauses	**6**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

10.1. Enforcement agencies and framework:

Evidence

The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The Alaska Wildlife Troopers enforce sablefish fisheries regulations in state waters. All landings of sablefish must be reported to NMFS via its mandatory “e-landings” reporting system.

OLE and USCG are responsible for enforcement of regulations in the IFQ fisheries. OLE is responsible for shoreside enforcement and provides after hours surveillance while USCG engages in at-sea enforcement. The USCG documents at-sea violations and refers them to OLE for final action. OLE employs a multifaceted strategy to maximize compliance in the IFQ fisheries. This strategy includes educational outreach, partnerships, patrols, inspections, and investigations. OLE spends thousands of hours annually providing marine resource users with compliance assistance, including staffing booths at organized events, daily contacts in communities, ports, harbors, and at-sea to ensure that the most current and accurate regulatory information is widely distributed and understood.

OLE works closely with the Wildlife Troopers and the USCG to maximize compliance by sharing information, intelligence, knowledge, and resources. The formalized JEA (Joint Enforcement Agreement (JEA) with NOAA Fisheries Office of Law Enforcement (NOAA/OLE)) with the Wildlife Troopers provide the state with federal funding for personnel, equipment, operations, and authorization for the Wildlife Troopers to enforce federal fishing regulations while engaged in their regular duties. OLE also spends thousands of hours annually conducting patrols to provide a visible deterrence to potential violators, to monitor fishing and other marine activities, to detect violations, to conduct compliance inspections, and to provide compliance assistance. OLE personnel investigate reports or complaints of IFQ violations as well as regularly analyze IFQ data that may lead to investigations of abnormal activity and missing or questionable information. OLE has identified two monitoring and enforcement concerns related to IFQ fishing requirements.

Quota share in the IFQ Program are allocated by specific regulatory area. False reporting of the area of harvest for IFQ is a concern for OLE. Such area fished violations have the potential to significantly impact the IFQ fisheries because the IPHC establishes catch limits by management area and NMFS tracks IFQ catch by area to ensure these catch limits are not exceeded. OLE has limited ability to track at sea fishing activity and areas fished without the

use of VMS. In cases where VMS data is available, it has been instrumental in prosecuting false reporting violations in the IFQ fisheries where a fisherman has caught fish in one area, and upon landing, reported it from a different area. Requiring the use of VMS in IFQ fisheries would substantially improve OLE's ability to prosecute false reporting violations. This intentional violation is hard to detect without VMS and has the potential to impact the fishery resource.

The second enforcement concern is a type of IFQ overage caused when a QS holder on board a vessel has IFQ in two areas, but the vessel does not have VMS or an observer onboard. In this situation the QS holder is not allowed to harvest more fish in any one area than the amount of IFQ he has available for that given area. Violation of this requirement is commonly referred to as a multiple area violation and is considered an IFQ overage even though the QS holder has IFQ in both areas. This type of violation can result in significant fines and forfeiture of the "overage". Requiring VMS in the IFQ fisheries could help fishery participants avoid unintentional multiple area overages.

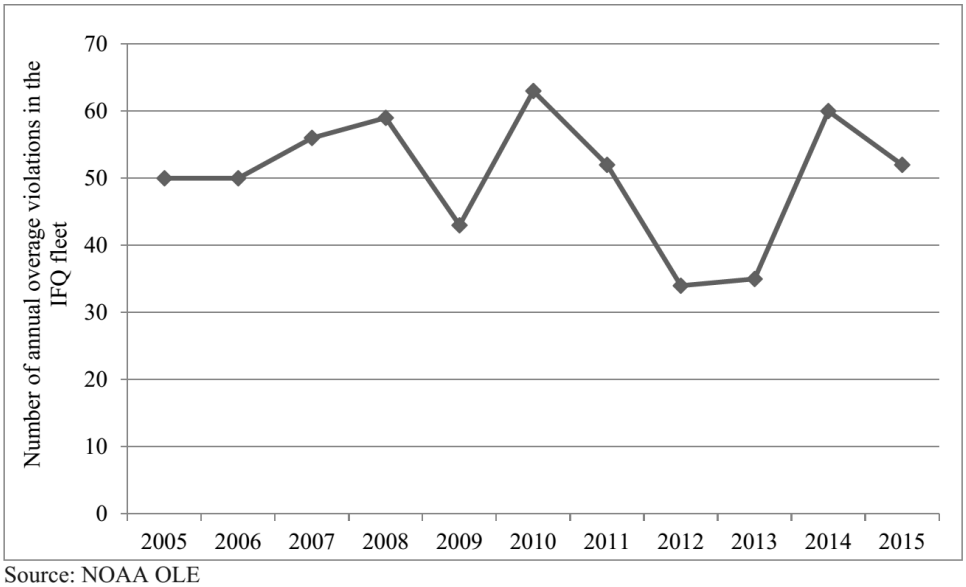
In Table 12, reported shoreside and at-sea IFQ fisheries violations, during 2005 through 2015 is provided. The data in this table is not standardized in any way. Annual changes in violations may be a factor of regulatory changes (increases / decreases in the number of potential violations), OLE's staffing changes in various ports, or changes in USCG patrol and/or OLE's shoreside monitoring efforts.

Table 12: Violations report 2005-2015, sablefish fishery. (Source: http://dps.alaska.gov/awt/Marine.aspx)

Violation Type	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Not Maintaining continuous transit during a closed period	0	0	0	0	0	0	0	0	2	0	0
Failure to use Seabird Avoidance Gear	1	8	9	0	3	0	0	2	14	6	2
Fishing in Closed Area	2	2	4	1	2	1	4	8	4	1	0
FFP/IFQ Permit/Cardholder not onboard	8	5	0	1	9	4	3	6	13	3	6

Expired FFP	12	24	13	1	9	3	16	4	1	0	0
Missing Boarding Ladder	2	2	0	2	8	5	1	1	7	1	1
Insufficient Sea Bird Avoidance	13	7	2	3	2	5	4	2	0	0	0
Logbook Discrepancy	2	1	10	6	5	8	1	7	11	6	1
Fishing for halibut without a permit	8	7	8	7	13	10	6	5	7	1	1
Subsistence Fishing with too many hooks	4	0	1	20	1	10	2	1	1	0	0

The management system enforce a number of rules. For example, if a person exceeds their remaining IFQ account balance at the time of landing by over 10%, this becomes an overage violation and an enforcement action rather than an administrative adjustment to an IFQ account. An overage violation is detected at the time of landing if the IFQ landing is in excess of 10% of the remaining balance on the IFQ account at the time of landing. When a QS holder exceeds this balance by more than 10%, the entire overage is seized by the government. NOAA's Office of Law Enforcement (OLE) administers all overage violations above the 10% allowable adjustment threshold. The underlying reason for this variability is uncertain, but is likely to be a combination of fluctuations in monitoring/enforcement effort, IFQ fishermen's behavior, and changes in the regulatory environment and catch per unit effort. This inter-annual variability does not seem to be a factor of changes in the number of total IFQ permits, which have consistently decreased from 2005 to 2015.



Source: NOAA OLE

Figure 5: Overage violations in the IFQ fleet, 2005-2015. (Source: NOAA OLE)

10.2./10.3/10.4. Fishing permit requirements:

Evidence

Annually, NMFS issues eligible Quota Shareholders an IFQ fishing permit that authorizes participation in the IFQ fisheries for sablefish and halibut. Detailed data on the number and location of Alaskan fishers, vessels, permits issued, etc. can be found in Fissel et al. 2016[93].

Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission website[94]. Fishermen in the state-managed fisheries must register prior to fishing and are required to keep a logbook during the fishery. Completed logbook pages must be attached to the ADFG copy of the fish ticket at the time of delivery.

[93] https://www.afsc.noaa.gov/REFM/Docs/2016/economic.pdf
[94] https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

7.5.2. Fundamental Clause 11

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

Number of Supporting clauses	3
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

11.1/11.2/11.3. Enforcement policies and regulations, state and federal:

The MSA is the overarching legislation and regulation for groundfish (and sablefish) fisheries in Alaska. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce Alaska fisheries laws and regulations, especially 50CFR679. The Alaska Wildlife Troopers enforce halibut regulations in state waters. The 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. Penalties under the Halibut Act (Table 13) are as follows[95]:

Table 13: Offence level and penalty matrix according to the MSA. (Source: http://www.gc.noaa.gov/documents/Penalty%20Policy_FINAL_07012014_combo.pdf)

Penalty Matrix for the Magnuson-Stevens Act

	Level of Culpability			
Gravity Offense Level	A Unintentional	B Negligent	C Reckless	D Intentional
I	Written warning-$2,000	Written warning-$4,000	$2,000-$6,000	$6,000-$8,000
II	$2,000-$4,000	$4,000-$6,000	$6,000-$10,000	$10,000-$20,000
III	$4,000-$10,000	$10,000-$15,000	$15,000-$20,000	$20,000-$40,000 Permit sanction of 5-20 days for subsequent violations*

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

IV	$10,000-$15,000	$15,000-$25,000	$20,000-$40,000 Permit sanction of 10-20 days for subsequent violations *	$40,000-$60,000 Permit sanction of 20-60 days *
V	$15,000-$25,000	$25,000-$40,000 Permit sanction of 10-20 days for subsequent violations *	$40,000-$60,000 Permit sanction of 20-60 days*	$60,000-$100,000 Permit sanction of 60-180 days*
VI	$25,000-$40,000 Permit sanction of 5-20 days for subsequent violations*	$40,000-$60,000 Permit sanction of 20-60 days*	$60,000-$100,000 Permit sanction of 60-180 days*	$100,000-statutory maximum Permit sanction of 180 days to 1 year *

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 MSA provides four basic enforcement remedies for violations (50CFR600.740 Enforcement policy):

1. Issuance of a citation, usually at the scene of the offense (see 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 MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In summary, the MSA 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[96].

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

7.6. Section F. Serious Impacts of the Fishery on the Ecosystem

7.6.1. Fundamental Clause 12

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.

Number of Supporting clauses	**16**
Supporting clauses applicable	N/A
Supporting clauses not applicable	N/A
Overall level of conformity	Full Conformance
Non Conformances	N/A

Summarized evidence:

12.1. Assessment of environmental effects on target stocks and ecosystem

Ecosystem effects on the stock

Prey population trends

Young-of-the-year sablefish prey mostly on euphausiids (Sigler et al. 2001) and copepods (Grover and Olla 1990), while juvenile and adult sablefish are opportunistic feeders. Larval sablefish abundance has been linked to copepod abundance and young-of-the-year abundance may be similarly affected by euphausiid abundance because of their apparent dependence on a single species (McFarlane and Beamish 1992). The dependence of larval and young-of-the-year sablefish on a single prey species may be the cause of the observed wide variation in annual sablefish recruitment. No time series is available for copepod and euphausiid abundance, so predictions of sablefish abundance based on this predator-prey relationship are not possible.

Juvenile and adult sablefish feed opportunistically, so diets differ throughout their range. In general, sablefish < 60 cm consume more euphausiids, shrimp, and cephalopods, while sablefish > 60 cm consume more fish (Yang and Nelson 2000). In the GOA, fish constituted 3/4 of the stomach content weight of adult sablefish with the remainder being invertebrates (Yang and Nelson 2000). Of the fish found in the diets of adult sablefish, pollock were the most abundant item while eulachon, capelin, Pacific herring, Pacific cod, Pacific sand lance, and flatfish also were found. Squid were the most important invertebrate and euphausiids and jellyfish were also present. In southeast Alaska, juvenile sablefish also consume juvenile salmon at least during the summer months (Sturdevant et al. 2009). Off the coast of Oregon and California, fish made up 76 percent of the diet (Laidig et al. 1997), while euphausiids dominated the diet off the southwest coast of Vancouver Island (Tanasichuk 1997). Off Vancouver Island, herring and other fish were increasingly important as sablefish size increased; however, the most important prey item was euphausiids. It is unlikely that juvenile and adult sablefish are affected by availability and abundance of individual prey species because they are opportunistic feeders. The only likely way prey could affect growth or survival of juvenile and adult sablefish is by overall changes in ecosystem productivity.

Predators/Competitors: The main juvenile sablefish predators are adult coho and chinook salmon, which prey on young-of-the-year sablefish during their pelagic stage. Sablefish were the fourth most commonly reported prey species in the salmon troll logbook program from 1977 to 1984 (Wing 1985), however the effect of salmon predation on sablefish survival is unknown. The only other fish species reported to prey

on sablefish in the GOA is Pacific halibut; however, sablefish comprised less than 1% of their stomach contents (M. Yang, October 14, 1999, NOAA, pers. comm. with SAFE author). Although juvenile sablefish may not be a prominent prey item because of their relatively low and sporadic abundance compared to other prey items, they share residence on the continental shelf with potential predators such as arrowtooth flounder, halibut, Pacific cod, bigmouth sculpin, big skate, and Bering skate, which are the main piscivorous groundfishes in the GOA (Yang et al. 2006). It seems possible that predation of sablefish by other fish is significant to the success of sablefish recruitment even though they are not a common prey item.

Sperm whales are likely a major predator of adult sablefish. Fish are an important part of sperm whale diet in some parts of the world, including the northeastern Pacific Ocean (Kawakami 1980). Fish have appeared in the diets of sperm whales in the eastern AI and GOA. Although fish species were not identified in sperm whale diets in Alaska, sablefish were found in 8.3% of sperm whale stomachs off of California (Kawakami 1980). Sablefish distribution is typically thought to be on the upper continental slope in deeper waters than most groundfish. However, during the first two to three years of their life sablefish inhabit the continental shelf. Length samples from the NMFS bottom trawl survey suggest that the geographic range of juvenile sablefish on the shelf varies dramatically from year to year. In particular, juveniles utilize the Bering Sea shelf extensively in some years, while not at all in others (Shotwell et al. 2014). Juvenile sablefish (< 60 cm FL) prey items overlap with the diet of small arrowtooth flounder. On the continental shelf of the GOA, both species consumed euphausiids and shrimp predominantly; these prey are prominent in the diet of many other groundfish species as well. This diet overlap may cause competition for resources between small sablefish and other groundfish species.

Changes in the physical environment: 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. (2014) 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.

Anthropogenic changes in the physical environment: The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS 2005) concluded that the effects of commercial fishing on the habitat of sablefish is minimal or temporary in the current fishery management regime primarily based on the criterion that sablefish are currently above Minimum Stock Size Threshold (MSST). Juvenile sablefish are partly dependent on benthic prey (18% of diet by weight) and the availability of benthic prey may be adversely affected by fishing. Little is known about effects of fishing on benthic habitat or the habitat requirements for growth to maturity. Although sablefish do not appear to be directly dependent on physical structure, reduction of living structure is predicted in much of the area where juvenile sablefish reside and this may indirectly reduce juvenile survivorship by reducing prey availability or by altering the abilities of competing species to feed and avoid predation[97].

Further research of environmental effects on the ecosystem is conducted by the following:

[97] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

North Pacific Research Board (NPRB)[98]
The NPFB conducts research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean prioritizing on research efforts designed to address pressing fishery management or marine ecosystem information needs.

Bering Sea Integrated Ecosystem Research Program[99]
The Bering Sea Integrated Ecosystem Research Program is a $52 million partnership between the NPRB and the National Science Foundation (NSF) that seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than one hundred scientists are engaged in field research and ecosystem modeling to link climate, physical oceanography, plankton, fishes, seabirds, marine mammals, humans, traditional knowledge and economic outcomes to better understand the mechanisms that sustain this highly productive region.

The Gulf of Alaska Integrated Ecosystem Research Project (IERP)[100]
The Gulf of Alaska Integrated Ecosystem Research Project (IERP) is a program of the NPRB that seeks to understand how environmental and anthropogenic processes, including climate change, affect trophic levels and dynamic linkages among trophic levels, with emphasis on fish and fisheries, marine mammals, and seabirds within the GOA. Implementation of the GOA IERP is structured around four separately completed components which will link together to form a fully integrated ecosystem study in the Gulf of Alaska. The four components of this program are:

Upper Trophic Level (UTL)
The overall goal of this component focuses on identifying and quantifying the major ecosystem processes that regulate recruitment strength of key groundfish species (arrowtooth flounder, Pacific cod, Pacific ocean perch, sablefish, and walleye pollock) in the GOA. The focus is on a functional group of five predatory fish species that are commercially important and account for most of the predatory fish biomass in the GOA. Taken together they encompass a range of life history strategies and geographic distributions that provide contrast to explore regional ecosystem processes.

Forage Base
To focus on forage base and resources which influence the productivity of the top level predator(s) chosen. The type, quality and quantity of food, and its timing and location, are critical to understanding higher trophic level responses.

Lower Trophic Level and Physical Oceanography
To focus on biological and physical oceanographic parameters on which this portion of the ecosystem is based. This includes euphausiids, fish eggs, and larval fishes.

Ecosystem Modeling
To describe and predict the responses (and variability therein) of this portion of the GOA ecosystem to environmental and anthropogenic processes, including climate change.

[98] http://www.nprb.org/
[99] http://www.nprb.org/bering-sea-project
[100] http://gulfofalaska.nprb.org/

Also, the Pacific States Marine Fisheries Commission[101] coordinates research activities, monitors fishing activities, collects and maintains databases on marine fish occurring off the California, Oregon, Washington, and Alaska coast.

Another major ecosystem research report is the AFSC Ecosystem Consideration Report series (see https://access.afsc.noaa.gov/reem/ecoweb/). The Ecosystem Considerations reports are produced annually to compile and summarize information about the status of the Alaska marine ecosystems for the North Pacific Fishery Management Council, the scientific community and the public. As of 2016, there are separate reports for the Eastern Bering Sea (EBS), Aleutian Islands (AI), the Gulf of Alaska (GOA), and Arctic (forthcoming) ecosystems. These reports include ecosystem assessments, and ecosystem and ecosystem-based management indicators that together provide context for ecosystem-based fisheries management in Alaska.

12.2 Research and Institutional capacity for environmental impact assessment

Evidence

The, NPFMC and NOAA/NMFS conduct assessments and research related to fishery impacts on ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document[102], annual Ecosystem Considerations documents, and the various other research reports. Furthermore, every time a major change is proposed to regulations affecting fisheries management such as the revision of a fishery management plan, a federal National Environmental Policy Act (NEPA) analysis is initiated (essentially a socio-economic and environmental assessment of the proposed changes)[103].

The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that benthic longline and fish pot fisheries have minimal or temporary impacts on sablefish habitat while trawl fisheries have substantial long term effects. However, in recent years, even the impacts from trawl fisheries in Alaska resulting from gear modifications (raining the bobbins from the seafloor) have decreased.

[101] http://psmfc.org
[102] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[103] https://ceq.doe.gov/docs/get-involved/Citizens_Guide_Dec07.pdf

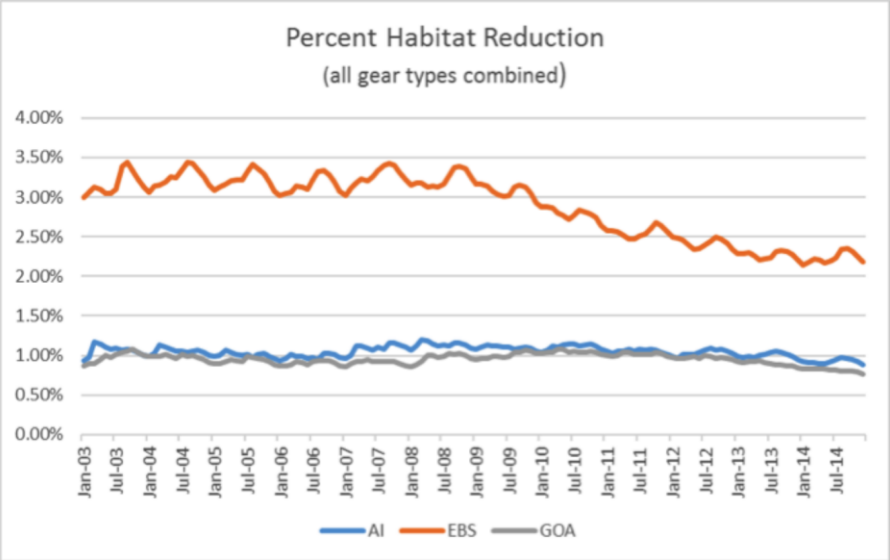


Figure 6: percent habitat impact or reduction by area fished. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf)

In Figure 6, the percent habitat impacts due to fishing gear (pelagic and non-pelagic trawl, longline, and pot) interactions have decreased steadily from 2008 to the present in the Bering Sea[104].

It is also concluded that the effects of commercial fishing on the habitat of sablefish is minimal or temporary in the current fishery management regime primarily based on the criterion that sablefish are currently above Minimum Stock Size Threshold (MSST)[105].

12.3./12.4/12.5/12.6. Fishery Interaction with the ecosystem, non-target catches, discards associated, dependent or endangered species

Evidence

Fishery effects on the ecosystem

Fishery-specific contribution to bycatch of prohibited species, forage species, HAPC biota, marine mammals and birds, and other sensitive non-target species

The sablefish fishery catches significant portions of the shark and thornyhead rockfish total catch. The sablefish fishery catches the majority of grenadier total catch; the annual amount is variable. The trend in seabird catch is variable, but is substantially low compared to the 1990s, presumably due to widespread use of measures to reduce seabird catch Prohibited species catches (PSC) in the targeted sablefish fisheries are dominated by halibut and golden king crab. BSAI and GOA halibut catches in 2016 were below the 2012-2016 average, while BSAI golden king crab catches were higher in 2016 than the 5 year mean. Crab catch fluctuates greatly and is largely driven by the amount of pot gear effort that occurs in the Aleutian Islands region, which varies from year to year. The shift

[104] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[105] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

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. Length frequencies from the pot fishery in the BSAI are very similar to the longline fishery. 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 on bedrock, cobbles, or sand is unlikely.

The evaluation of the fishery effect on ecosystem components (including non-living substrates) is provided in previous sections of this report. Consequential impacts were not considered to be significant and measures of monitoring are established to initiate intervention where any need is identified.

Sablefish fisheries bycatch

Information on levels of bycatch is recorded for groundfish species in the targeted sablefish fishery (Table 14).

Table 14: Bycatch of non-target species and HAPC biota in the targeted sablefish fishery. (Source: NMFS AKRO Blend/Catch Accounting System via AKFIN, September 25, 2016).

	Hook and Line			Other Gear			All Gear		
Species	Discard	Retained	Total	Discard	Retained	Total	Discard	Retained	Total
GOA Thornyhead Rockfish	216	424	640	5	27	32	221	451	671
Shark	426	1	427	0	0	0	427	1	427
GOA Shortraker Rockfish	157	92	249	9	1	11	166	93	260
Arrowtooth Flounder	157	15	172	56	2	58	212	17	229
GOA Skate, Longnose	163	9	172	0	0	0	163	9	172
GOA Rougheye Rockfish	84	82	167	1	2	3	85	84	170
GOA Skate, Other	162	2	164	1	0	1	163	2	165
Other Rockfish	55	75	130	1	1	2	56	76	132
Pacific Cod	63	35	98	0	3	3	63	37	101
BSAI Skate	53	1	54	0	0	0	53	1	54

	Estimated Catch (t)					
Group Name	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Benthic urochordata	0.13	1.08	0.00	0.00	0.49	0.00
Bivalves	0.05	0.01	0.00	0.00	0.01	0.01
Brittle star unidentified	0.45	4.56	0.10	0.64	2.05	0.13
Corals Bryozoans	5.70	7.55	12.62	4.96	4.49	4.88
Dark Rockfish	0.00	0.03	0.06	0.04	0.05	0.05
Eelpouts	0.63	0.63	1.13	0.77	0.24	0.05
Giant Grenadier	7,051	7,009	9,440	4,839	4,830	5,824
Greenlings	0.02	0.00	0.00	0.00	0.06	0.01
Grenadier	844	1,017	1,469	877	707	352
Hermit crab unidentified	0.21	0.08	0.09	0.16	0.03	0.00
Invertebrate unidentified	2.09	6.81	0.18	0.12	0.53	0.12
Large Sculpins	3.89	5.13	20.48	6.01	7.36	6.29
Misc crabs	1.14	0.32	0.52	0.50	0.07	0.01
Misc crustaceans	0.00	0.00	0.00	0.15	0.00	0.01
Misc fish	8.44	10.11	29.19	25.03	16.61	11.54
Scypho jellies	0.68	0.00	0.00	5.51	0.24	0.11
Sea anemone unidentified	3.29	0.99	0.92	2.92	12.44	1.39
Sea pens whips	1.58	0.25	0.35	2.17	2.65	0.93
Sea star	3.46	3.00	14.94	11.06	9.19	7.17
Snails	19.67	12.15	8.82	3.64	3.37	0.09
Sponge unidentified	2.09	0.94	3.37	1.63	3.48	0.40
Urchins, dollars, cucumbers	0.26	0.78	0.86	0.78	2.47	0.09

Giant grenadier

The corresponding reference values for likely ecologically sensitive species such as Grenadier are summarized in the following tables (Table 15), with the unofficial ABC and OFL values in bold. Overfishing is not occurring in either the BSAI or GOA.

Table 15: Grenadiers biological estimates in the GOA and BSAI. (Source: https://www.afsc.noaa.gov/refm/stocks/assessments.htm

Gulf of Alaska Grenadiers

Quantity	As estimated or specified *last* year for[a]: 2016	2017	As estimated or recommended *this* year for: 2017	2018
M (natural mortality)	0.078	0.078	0.078	0.078
Specified/recommended Tier	5	5	5	5
Biomass (t)	524,624	524,624	507,888	507,888
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)	**40,921**	40,921	**39,615**	39,615
maxABC (t)	30,691	30,691	**29,711**	29,711
ABC (t)	**30,691**	30,691	**29,711**	29,711
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
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 2014.
These are unofficial ABC and OFL values since grenadier are an Ecosystem Component, which do not have ABCs or OFLs.

Bering Sea and Aleutian Islands Grenadiers

Quantity	As estimated or specified *last* year for[a]: 2016	2017	As estimated or recommended *this* year for: 2017	2018
M (natural mortality)	0.078	0.078	0.078	0.078
Specified/recommended Tier	5	5	5	5
Biomass (t)	1,286,734	1,286,734	1,197,110	1,286,734
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)	**100,365**	100,365	**93,375**	93,375
maxABC (t)	75,274	75,274	**70,031**	70,031
ABC (t)	**75,274**	75,274	**70,031**	70,031
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
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 2014.
These are unofficial ABC and OFL values since grenadier are an Ecosystem Component, which do not have ABCs or OFLs.

Sharks

The shark complex (Pacific sleeper shark, spiny dogfish, salmon shark and other/unidentified sharks) in the Bering Sea and Aleutian Islands (BSAI) is assessed on a biennial stock assessment schedule in even years to coincide with RACE Eastern Bering Sea trawl surveys. 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). The stock complex was not subject to overfishing last year (Table 16), and data do not exist to determine if the species in the complex are overfished[106].

Table 16: Overfishing update for Shark complex in the sablefish fishery. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIshark.pdf)

ABC and OFL calculations and Tier 6 recommendations for 2017 – 2018. OFL = maximum shark catch from 2003 – 2015. ABC = OFL*0.75.

	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2016	2017	2017	2018
Tier	6	6	6	6
OFL (t)	1,363	1,363	**689**	689
maxABC (t)	1,022	1,022	517	517
ABC (t)	1,022	1,022	**517**	517
	As determined *last* year for:		As determined *this* year for:	
Status	2014	2015	2015	2016
Overfishing	No	n/a	No	n/a

Summaries for Plan Team

Species	Year	Biomass[1]	OFL	ABC	TAC	Catch[2]
Shark Complex	2015		1,363	1,022	125	107
	2016		1,363	1,022	125	112
	2017		689	517		
	2018		689	517		

[1]The shark complex in the BSAI is a Tier 6 complex with no reliable estimates of biomass
[2]Catch as of October 3, 2016

The shark complex (spiny dogfish, Pacific sleeper shark, salmon shark and other/unidentified sharks) in the Gulf of Alaska (GOA) is assessed on a biennial stock assessment schedule. 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. 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. There is no evidence to suggest that over fishing is occurring for any shark species in the GOA (Table 17) because the OFL has not been exceeded[107].

[106] https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIshark.pdf
[107] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAshark.pdf

Table 17: Biological recommendations for Shark complex, 2017-2018. (Source: https://www.afsc.noaa.gov/REFM/Docs/2016/GOAshark.pdf)

Spiny Dogfish Quantity	As estimated or *specified last* year for: 2016	2017	As estimated or *recommended this* year for: 2017	2018
M (natural mortality rate)	0.097	0.097	0.097	0.097
Tier	6*	6*	6*	6*
Biomass (t)	56,181	56,181	56,181	56,181
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)	5,450	5,450	**5,450**	5,450
maxABC (t)	4,087	4,087	4,087	4,087
ABC (t)	4,087	4,087	**4,087**	4,087
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
Overfishing		n/a		n/a

The shark complex is Tier 6, however, spiny dogfish ABC and OFL are calculated using a Tier 5 approach. It is termed a modified Tier 6 (or Tier 6) because the estimate of biomass is not considered reliable for the species.

ABC and OFL Calculations and Tier 6 recommendations for Pacific sleeper sharks, salmon sharks and other sharks for 2017-2018.

Pacific sleeper, salmon and other sharks Quantity	As estimated or *specified last* year for: 2016	2017	As estimated or *recommended this* year for: 2017	2018
Tier	6	6	6	6
OFL (t)	570	570	**570**	570
maxABC (t)	427	427	427	427
ABC (t)	427	427	**427**	427
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
Overfishing		n/a		n/a

Summaries for Plan Team

Species	Year	Biomass[1]	OFL[2]	ABC[2]	TAC	Catch[3]
Shark Complex	2015	76,452	7,986	5,989	5,989	1,414
	2016	56,181	6,020	4,514	4,514	1,329
	2017	56,181	6,020	4,514		
	2018	56,181	6,020	4,514		

[1]This is spiny dogfish biomass only, because the biomass estimates for the remaining shark species in the complex are not used for ABC and OFL calculations (they are estimated using average catch). The biomass used for the spiny dogfish ABC and OFL calculations for 2016 - 2017 is the estimated biomass from the random effects approach to survey averaging.
[2]ABC and OFL are the sum of the individual species recommendations, Tier 6 (avg catch 1997-2007) for Pacific sleeper shark, salmon shark, and other/unidentified sharks and a modified Tier 6 (biomass * F_{max}) for spiny dogfish.
[3]Catch as of October 3, 2016.

Thornyhead rockfish

For the 2017 fishery, GOA SAFE authors recommend the maximum allowable ABC of 1,961 t for thornyhead

rockfish[108]. Reference values for thornyhead rockfish are summarized in the following table, with the recommended ABC and OFL values in bold. The stock was not being subjected to overfishing last year.

Table 18: Thornyhead rockfish biological reference points. (Source: https://www.afsc.noaa.gov/refm/stocks/assessments.htm)

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2016	2017	2017	2018
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	87,155	87,155	87,155	87,155
F_{OFL}	$F=M=0.03$	$F=M=0.03$	$F=M=0.03$	$F=M=0.03$
$maxF_{ABC}$	$0.75M=0.0225$	$0.75M=0.0225$	$0.75M=0.0225$	$0.75M=0.0225$
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	2,615	2,615	**2,615**	2,615
maxABC (t)	1,961	1,961	1,961	1,961
ABC (t)	1,961	1,961	**1,961**	1,961
Status	As determined *last* year for:		As determined *this* year for:	
	2014	2015	2015	2016
Overfishing	No	n/a	No	n/a

The two most abundant species for Other Rockfish complex (Table 19) are dusky rockfish and shortspine thornyheads (SST). Shortspine thornyheads (SST) occur throughout the Aleutian Islands (AI) and eastern Bering Sea (EBS) slope but are most abundant in the western AI, where they are found between 200 m and 500 m depth (Reuter and Spencer 2001). No overfishing occurred in 2015.

[108] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAthorny.pdf

Table 19: Rockfish complex biological reference points. (Source: https://www.afsc.noaa.gov/refm/stocks/assessments.htm)

Summary for **SST portion** of the Other Rockfish complex.

Quantity	As estimated or *specified last* year for: 2016	2017	As estimated or *recommended this* year for: 2017	2018
M (natural mortality rate)	0.03	0.03	0.03	0.03
Tier	5	5	5	5
Biomass (t)	46,647	46,647	52,761	52,761
F_{OFL}	0.03	0.03	0.03	0.03
$maxF_{ABC}$	0.0225	0.0225	0.0225	0.0225
F_{ABC}	0.0225	0.0225	0.0225	0.0225
OFL (t)	1,399	1,399	1,583	1,583
maxABC (t)	1,050	1,050	1,187	1,187
ABC (t)	1,050	1,050	1,187	1,187
AI ABC (t)	374	374	398	398
EBS ABC (t)	676	676	789	789
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
Overfishing	No	n/a	No	n/a

PSC Catches in the sablefish fishery

In Table 20, Prohibited Species Catch (PSC) estimates are reported in tons for halibut and numbers of animals for crab and salmon, by year, and fisheries management plan (BSAI or GOA) for the sablefish fishery. Other = Pot and trawl combined because of confidentiality. Source: NMFS AKRO Blend/Catch Accounting System PSCNQ via AKFIN, September 25, 2016.

Table 20: Prohibited species catch monitoring in the sablefish fishery. (Source: NMFS AKRO Blend/Catch Accounting System PSCNQ via AKFIN, September 25, 2016)

				BSAI				
Hook	Year	Bairdi	Chinook	Golden KC	Halibut	Other salmon	Opilio	Red KC
and	2012	0	0	420	82	0	0	7
Line	2013	0	15	465	66	0	0	0
	2014	0	0	460	38	0	0	44
	2015	0	9	177	23	0	0	206
	2016	0	0	108	9	0	0	0
	Mean	0	5	326	44	0	0	51
Other	2012	0	0	16,772	10	0	121	0
	2013	365	0	788	18	0	314	0
	2014	0	0	3,193	6	0	1,679	0
	2015	0	0	29,029	1	0	26	0
	2016	0	0	15,082	1	0	0	0
	Mean	73	0	12,973	7	0	428	0
BSAI Mean		73	5	13,299	51	0	428	51
				GOA				
Hook	2012	0	0	23	293	0	0	0
and	2013	78	0	93	273	0	0	24
Line	2014	6	0	39	250	0	0	0
	2015	164	0	38	293	0	0	12
	2016	0	0	36	218	0	0	25
	Mean	50	0	46	265	0	0	12
Other	2012	0	0	9	5	0	0	0
	2013	0	0	0	12	12	0	0
	2014	0	0	18	2	0	0	0
	2015	25	0	0	3	0	0	0
	2016	0	0	32	6	0	0	0
	Mean	5	0	12	5	2	0	0
GOA Mean		55	0	58	271	2	0	12

Results from the 2016 Electronic Monitoring Project[109]

In addition to observer coverage the sablefish fishery participated in EM coverage of smaller vessels in 2016. Twenty-five longline vessels participated in the 2016 pre-implementation EM project. EM data was collected on 34 halibut trips, 12 Pacific cod trips, and 31 sablefish trips containing 230, 160 and 167 hauls respectively. Some vessels participated in more than one fishery. The data spanned 165 halibut sea days, 49 Pacific cod sea days, and 143 sablefish sea days for a total of 357 sea days with trips averaging 4.9, 4.1, and 4.6 days respectively (Table 21).

Effort Log

Seventy-two of the 77 trips (94%) had a complete logbook submitted with the video data (Table 21).

[109] https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf

Table 21: Summary of EM monitored fishing activity for 2016. (Source: https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf)

Data Summary	Longline Halibut	Longline Pacific Cod	Longline Sablefish	All Fisheries
Vessels	17	3	12	**25**
Trips	34	12	31	**77**
Hauls	230	160	167	**557**
Sea Days	165	49	143	**357**
Average Trip Length	4.9	4.1	4.6	**4.6**

State Fisheries

Given the small size of the sablefish fisheries in state waters, bycatch is not considered significant. The state of Alaska manages bycatch in state waters and sets allowable bycatch amounts for key species[110].

Habitat effects

As previously mentioned (and shown in Figure 6), the Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that benthic longline and fish pot fisheries have minimal or temporary impacts on sablefish habitat while trawl fisheries have substantial long term effects. However, in recent years, even the impacts from trawl fisheries in Alaska resulting from gear modifications (raining the bobbins from the seafloor) have decreased. Habitat impacts due to fishing gear (pelagic and non-pelagic trawl, longline, and pot) interactions have decreased steadily from 2008 to the present in the Bering Sea[111].

It also concluded that the effects of commercial fishing on the habitat of sablefish is minimal or temporary in the current fishery management regime primarily based on the criterion that sablefish are currently above Minimum Stock Size Threshold (MSST)[112].

ETP species, seabirds and marine mammals' interactions

The short-tailed albatross is currently listed as Endangered under the Endangered Species Act and is protected by the Migratory bird Treaty Act which are implemented by the U.S. Fish and Wildlife Service (USFWS). In order to address the issue of bycatch in commercial fisheries, USFWS works with the National Marine Fisheries Service to set bycatch limits for the short-tailed albatross and implement seabird deterrent measures and requirements to reduce incidental take of seabirds[113]. Based on an internet search in June 2017 there does not seem to be any incidental catch in 2016 of short tailed albatross or interactions with Steller sea lions by any of the sablefish fisheries in Alaska.

[110] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[111] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[112] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[113] http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management

In Table 22, summary of estimated seabird bycatch in the hook-and-line groundfish and halibut fisheries is provided for the BSAI and GOA Groundfish FMP areas, 2007 through 2015. For halibut fisheries the period is 2013 through 2015 only (Table 23).

Table 22: Estimates of seabird interaction as bycatch. (Source: http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management)

Species/Species Group	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	Annual Average
Unidentified Albatrosses	17				10		28	33		88	10
Short-tailed Albatross				15	5			9		29	3
Laysan Albatross	13	226	71	222	206	141	200	99	223	1,403	156
Black-footed Albatross	201	303	56	71	222	81	444	297	371	2,046	227
Northern Fulmar	3,678	2,761	7,000	1,902	5,964	2,851	2,697	715	2,892	30,460	3,384
Shearwaters	2,860	1,211	574	502	260	529	195	114	321	6,567	730
Gulls	914	1,481	1,186	1,116	2,224	897	576	730	1,249	10,374	1,153
Kittiwakes	10		10		6	5	3	9	12	56	6
Murres	5	6	13			6				29	3
Puffins				9						9	1
Auklets						7		6	11	25	3
Cormorant									28	28	3
Unidentified Birds	498	541	652	267	387	322	296	77	184	3,225	358
Grand Total	8,195	6,530	9,563	4,105	9,284	4,840	4,439	2,090	5,292	54,337	6,037

Most (83%) of the sablefish[114] hook-and-line fishery seabird bycatch occurred in the GOA; the remainder occurred in the BSAI From 2007 through 2015, estimates of the annual seabird bycatch in the BSAI and GOA in this fishery ranged from 227 to 1,868 seabirds, with an annual average of 858 Seabird bycatch is largely Northern fulmars, followed by black-footed albatross, gulls, and Laysan albatross. No Endangered Short Tailed albatrosses were caught in recent years.

[114] https://docs.lib.noaa.gov/noaa_documents/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_12.pdf

Table 23: Estimates of seabird interaction as bycatch in halibut fishery. (Source: http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management)

Species/Species Group	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	Annual Average
Unidentified Albatrosses	17						28	23		68	8
Laysan Albatross	3	201	48	172	174	107	179	79	145	1,107	123
Black-footed Albatross	182	295	51	52	222	81	393	228	371	1,876	208
Northern Fulmar	1,050	82	84	44	823		138	58	128	2,407	267
Shearwaters	31			6	97			71	32	237	26
Gulls	463	53	299	220	544	39	46	8	148	1,819	202
Cormorants									28	28	3
Unidentified Birds	53	54	26	6	9				28	177	20
Grand Total	1,800	686	508	501	1,868	227	785	467	880	7,720	858

Although marine mammals such as sea lions are known to interact with halibut longline gear, bycatch is considered non-significant as shown in the most available data available.

In Table 24, summary of incidental mortality and serious injury of Western U.S. Steller sea lions due to U.S. commercial fisheries is provided for the period of 2010-2014, and calculation of the mean annual mortality and serious injury rate (Wynne et al. 1991, 1992; Breiwick 2013; MML, unpubl. data). N/A indicates that data are not available.[115]

Table 24: Estimates of incidental marine mammal interactions: (Source: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-355.pdf)

Fishery name	Years	Data type	Percent observer coverage	Observed mortality	Estimated mortality	Mean estimated annual mortality
Gulf of Alaska sablefish longline	2010 2011 2012 2013 2014	obs data	15 14 14 14 19	0 0 1 0 0	0 0 5.5 0 0	1.1 (CV = 0.89)

12.7. Role of the "stock under consideration" in the ecosystem

Evidence

Alaska Sablefish are not typically categorized as a key prey species for any single marine predator. Several comprehensive studies of the food web in various regions of the northern Pacific Ocean have not indicated that sablefish are heavily utilized by any predator. Predation on sablefish, especially by marine mammals, is apparently low, except in cases where the fish were attached to fishing gear. This is understandable, because adult sablefish are large, active animals that would be difficult to capture in open water. Also, their bottom dwelling habits, generally in offshore areas, make them less accessible to predation than schooling, pelagic species. Alaska

[115] https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-355.pdf

sablefish are not a key prey species; as such there is no need for management objectives and measures in place to avoid severe adverse impacts on dependent predators.

Juvenile and adult sablefish feed opportunistically, so diets differ throughout their range. In general, sablefish < 60 cm consume more euphausiids, shrimp, and cephalopods, while sablefish > 60 cm consume more fish (Yang and Nelson 2000). In the GOA, fish constituted 3/4 of the stomach content weight of adult sablefish with the remainder being invertebrates (Yang and Nelson 2000). Of the fish found in the diets of adult sablefish, pollock were the most abundant item while eulachon, capelin, Pacific herring, Pacific cod, Pacific sand lance, and flatfish also were found. Squid were the most important invertebrate and euphausiids and jellyfish were also present. In southeast Alaska, juvenile sablefish also consume juvenile salmon at least during the summer months (Sturdevant et al. 2009). Off the coast of Oregon and California, fish made up 76 percent of the diet (Laidig et al. 1997), while euphausiids dominated the diet off the southwest coast of Vancouver Island (Tanasichuk 1997). Off Vancouver Island, herring and other fish were increasingly important as sablefish size increased; however, the most important prey item was euphausiids. It is unlikely that juvenile and adult sablefish are affected by availability and abundance of individual prey species because they are opportunistic feeders. The only likely way prey could affect growth or survival of juvenile and adult sablefish is by overall changes in ecosystem productivity.

Predators/Competitors: The main juvenile sablefish predators are adult coho and chinook salmon, which prey on young-of-the-year sablefish during their pelagic stage. Sablefish were the fourth most commonly reported prey species in the salmon troll logbook program from 1977 to 1984 (Wing 1985), however the effect of salmon predation on sablefish survival is unknown. The only other fish species reported to prey on sablefish in the GOA is Pacific halibut; however, sablefish comprised less than 1% of their stomach contents (M. Yang, October 14, 1999, NOAA, pers. comm. with SAFE author). Although juvenile sablefish may not be a prominent prey item because of their relatively low and sporadic abundance compared to other prey items, they share residence on the continental shelf with potential predators such as arrowtooth flounder, halibut, Pacific cod, bigmouth sculpin, big skate, and Bering skate, which are the main piscivorous groundfishes in the GOA (Yang et al. 2006). It seems possible that predation of sablefish by other fish is significant to the success of sablefish recruitment even though they are not a common prey item.

Sperm whales are likely a major predator of adult sablefish. Fish are an important part of sperm whale diet in some parts of the world, including the northeastern Pacific Ocean (Kawakami 1980). Fish have appeared in the diets of sperm whales in the eastern AI and GOA. Although fish species were not identified in sperm whale diets in Alaska, sablefish were found in 8.3% of sperm whale stomachs off of California (Kawakami 1980). Sablefish distribution is typically thought to be on the upper continental slope in deeper waters than most groundfish. However, during the first two to three years of their life sablefish inhabit the continental shelf. Length samples from the NMFS bottom trawl survey suggest that the geographic range of juvenile sablefish on the shelf varies dramatically from year to year. In particular, juveniles utilize the Bering Sea shelf extensively in some years, while not at all in others (Shotwell et al. 2014). Juvenile sablefish (< 60 cm FL) prey items overlap with the diet of small arrowtooth flounder. On the continental shelf of the GOA, both species consumed euphausiids and shrimp predominantly; these prey are prominent in the diet of many other groundfish species as well. This diet overlap may cause competition for resources between small sablefish and other groundfish species[116].

12.8. Pollution – MARPOL

[116] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf

Evidence

MARPOL 73/78[117,118](the "International Convention for the Prevention of Pollution From Ships") is one of the most important treaties regulating pollution from ships. Six Annexes of the Convention cover the various sources of pollution from ships and provide an overarching framework for international objectives. In the U.S., the Convention is implemented through the Act to Prevent Pollution from Ships (APPS).

Under the provisions of the Convention, the United States can take direct enforcement action under U.S. laws against foreign-flagged ships when pollution discharge incidents occur within U.S. jurisdiction. When incidents occur outside U.S. jurisdiction or jurisdiction cannot be determined, the United States refers cases to flag states, in accordance with MARPOL. These procedures require substantial coordination between the Coast Guard, the State Department, and other flag states, and the response rate from flag states has been poor. Different regulations apply to vessels, depending on the individual state.

12.9. Knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them.

Evidence

The MSA requires fishery management plans to describe and identify Essential Fish Habitat (EFH), minimize to the extent practicable adverse effects of fishing on EFH, and identify other actions to conserve and enhance EFH (16 U.S.C. 1853(a)(7)). Alaska has more than 50% of the U.S. coastline and leads the United States in fish habitat area and value of fish harvested. Major research programs aim to identify habitats that contribute to the survival, growth, and productivity of sablefish, and to determine how to best manage and protect these habitats.

Essential fish habitat (EFH) research support is based on priorities from the EFH Research Implementation Plan for Alaska. Around $450,000 is spent on EFH research projects each year. Project results are described in annual reports and peer-reviewed literature. Study results contribute to existing Essential Fish Habitat data sets. All federal agencies must consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH.

All significant permits and actions are subject to the Environmental Impact Statement (EIS) process, which not only requires thorough review by scientists and agencies, but also mandates thorough and comprehensive public information and transparency. The FMP for Groundfish Fisheries in the EEZ off Alaska contains detailed descriptions of essential fish habitats (EFH) that occur in the state's marine waters, and habitat areas of particular concern.

Designations of EFH for sablefish in GOA[119] are as follow:

Eggs: EFH for sablefish eggs is the general distribution area for this life stage, located in deeper waters along the slope (200 to 3,000 m) throughout the GOA.

[117] https://www.law.cornell.edu/uscode/text/33/1901
[118] http://www.gao.gov/assets/230/228813.pdf
[119] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Larvae: EFH for larval sablefish is the general distribution area for this life stage, located in epipelagic waters along the middle shelf (50 to 100 m), outer shelf (100 to 200 m), and slope (200 to 3,000 m) throughout the GOA.
Early Juveniles: No EFH description determined. Generally, have been observed in inshore water, bays, and passes, and on shallow shelf pelagic and demersal habitat. Information is limited.
Late Juveniles: EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gullys along the slope (200 to 1,000 m) throughout the GOA.
Adults: EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gullys along the slope (200 to 1,000 m) throughout the GOA.

Designations of EFH for sablefish in the BSAI[120] are as follow:

Eggs: No EFH description determined. Scientific information notes the rare occurrence of sablefish eggs in the BSAI.
Larvae: EFH for larval sablefish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 m) and slope (200 to 3,000 m) throughout the BSAI.
Early Juveniles: No EFH description determined. Generally, have been observed in inshore water, bays, and passes, and on shallow shelf pelagic and demersal habitat. Information is limited.
Late Juveniles: EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gullys along the slope (200 to 1,000 m) throughout the BSAI.
Adults: EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gullys along the slope (200 to 1,000 m) throughout the BSAI.

The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that benthic longline and fish pot fisheries have minimal or temporary impacts on sablefish habitat while trawl fisheries have substantial long term effects. However, in recent years, even the impacts from trawl fisheries in Alaska resulting from gear modifications (raining the bobbins from the seafloor) have decreased[121].

It also concluded that the effects of commercial fishing on the habitat of sablefish is minimal or temporary in the current fishery management regime primarily based on the criterion that sablefish are currently above Minimum Stock Size Threshold (MSST)[122].

Furthermore, vast areas of the North Pacific have been permanently closed (Figure 7) to groundfish trawling and scallop dredging to reduce potential adverse impacts on sensitive habitat and to protect benthic invertebrates. These marine protected areas comprise a relatively large portion of the continental shelf, and in many respects, serve as marine reserves. In addition, fishery closures established in nearshore areas to reduce interactions with Steller sea lions have ancillary benefits of reducing habitat impacts as well[123].

[120] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[121] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[122] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[123] https://www.npfmc.org/habitat-protections/

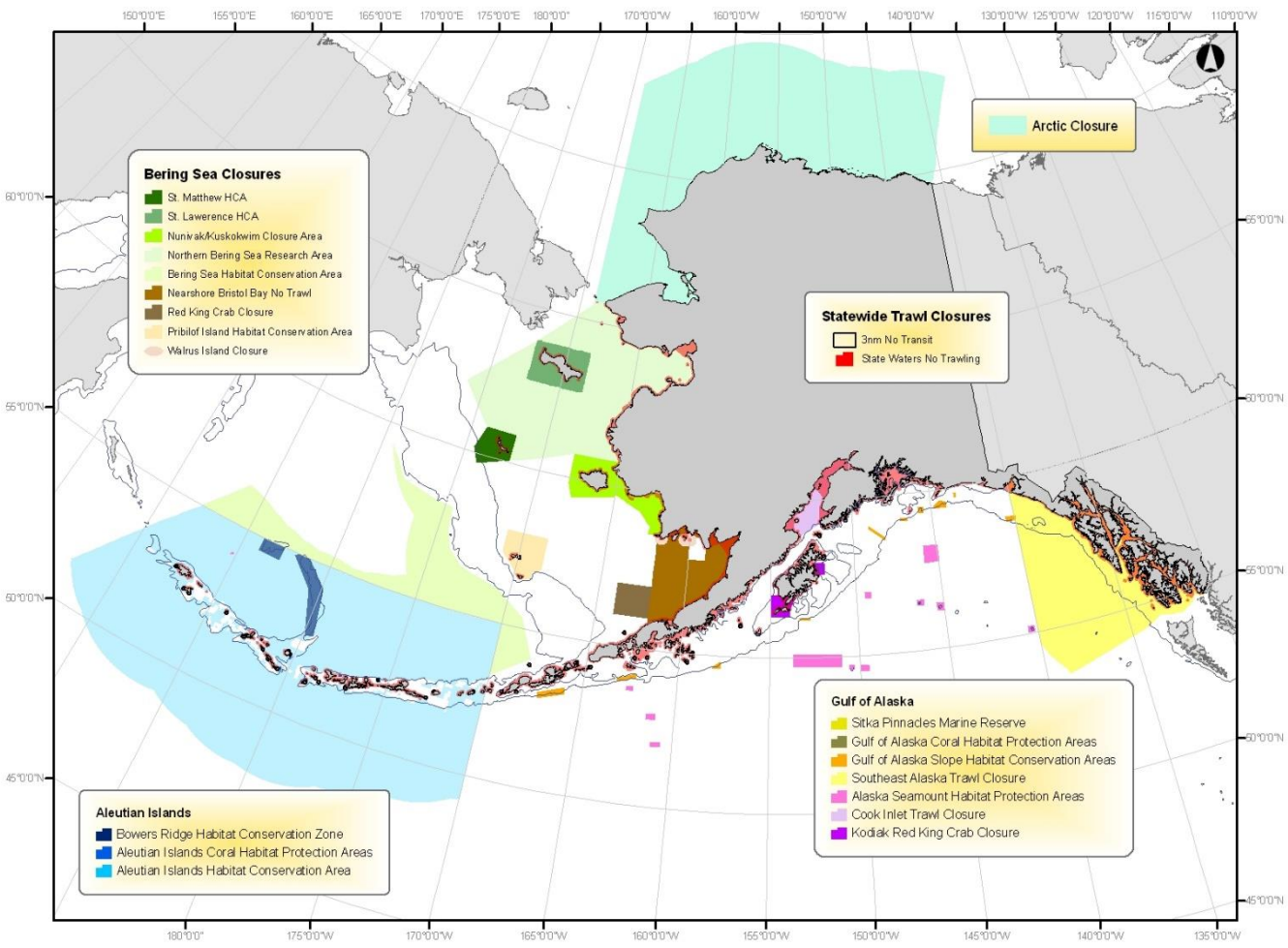


Figure 7: North Pacific fishery closed areas (as at 2017). (Source: https://www.npfmc.org/habitat-protections/)

12.10. Research shall be promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities.

Evidence

Socio-economic data collection and economic analyses are often included under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC's Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska[124]

The primary mission of the Economic and Social Sciences Research Program is to provide economic and sociocultural information that will assist NMFS in meeting its stewardship responsibilities. Activities in support of this mission include:

[124] http://www.afsc.noaa.gov/refm/Socioeconomics/Default.php

- Collecting economic and sociocultural data relevant for the conservation and management of living marine resources
- Developing models to use that data both to monitor changes in economic and sociocultural indicators and to estimate the economic and sociocultural impacts of alternative management measures
- Preparing reports and publications
- Participating on NPFMC, NMFS, and inter-agency working groups
- Preparing and reviewing research proposals and programs
- Preparing analyses of proposed management measures
- Assisting Alaska Regional Office and NPFMC staff in preparing regulatory analyses
- Providing data summaries

Many of these are cooperative activities conducted with other scientists at the Center, other NMFS sites, the NPFMC, other natural resource agencies, and universities. Currently, the research topics being addressed cooperatively by program staff and scientists at the University of Washington, the University of Alaska, and the University of California, Davis include regional economic impact models, behavioral models of fishing operations, indicators of economic performance, and the non-market valuation of living marine resources.

The Alaskan halibut and sablefish IFQ program has gone through numerous innovations over the years and has been officially modified many times since initial implementation including modifications to trading restrictions, eligibility rules, administrative catch accounting systems and more. In December 2016 the IPHC released the Twenty-Year Review of the Pacific Halibut and Sablefish Individual Fishing Quota Management Program.

The intent of the review was to evaluate the IFQ Program as required by the MSA and within the framework of the scope requested by the Council and its advisory bodies. Primarily, the IFQ Program was examined with respect to how well it has met its 10 original policy objectives and how it is providing entry opportunities for new participants, an objective that the Council has sought to provide through numerous revisions since the IFQ Program was implemented. The Council, its Advisory Panel (AP), Scientific and Statistical Committee (SSC), and IFQ Implementation Committee all provided feedback on the proposed structure and policy scope of this review document at the December 2015 and February 2016 Council meetings. In the 20 years since implementation of the IFQ Program, this was the first formal and comprehensive review of the program[125].

In the original Supplemental Environmental Impact Statement for the IFQ Program, the Council identified 10 policy objectives that it intended to address through specific elements of the IFQ Program. Specifically, in selecting the elements of the IFQ Program the Council attempted to do the following:

1. Address the problems that occurred with the open-access management regime. The Council identified 10 specific problems: Allocation conflicts, gear conflicts, deadloss from lost gear, bycatch loss, discard mortality, excess harvesting capacity, product wholesomeness, safety, economic stability in the fisheries and communities, and rural coastal community development of a small boat fleet.
2. Link the initial QS allocations to recent dependence on the halibut and sablefish fixed gear fisheries.
3. Broadly distribute QS to prevent excessively large QS from being given to some persons.
4. Maintain the diversity in the fleet with respect to vessel categories.
5. Maintain the existing business relationships among vessel owners, crews, and processors.

[125] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf

6. Assure that those directly involved in the fishery benefit from the IFQ Program by assuring that these two fisheries are dominated by owner/operator operations.
7. Limit the concentration of quota share ownership and IFQ usage that will occur over time.
8. Limit the adjustment cost to current participants including Alaskan coastal communities.
9. Increase the ability of rural coastal communities adjacent to the Bering Sea and Aleutian Islands to share in the wealth generated by the IFQ Program.
10. Achieve previously stated Council goals and objectives and meet MSA requirements.

The reviewed assessed the impacts of the IFQ Program with respect to these initial 10 policy objectives.

Many of these are cooperative activities conducted with other scientists at the Center, other NMFS sites, the NPFMC, other natural resource agencies, and universities. Currently, the research topics being addressed cooperatively by program staff and scientists at the University of Washington, the University of Alaska, and the University of California, Davis include regional economic impact models, behavioral models of fishing operations, indicators of economic performance, and the non-market valuation of living marine resources.

12.11. Outcome indicator(s) and management objectives for non-target stocks.

Evidence

There is a strategy in place to manage the non-target species which consists of:

1. a catch accounting system,
2. observer program to estimate catches of non-target species, that was heavily restructured in 2013 to better sample the full groundfish fleet, including halibut vessels which previously had minimal coverage,
3. fishery independent surveys conducted by NOAA-Fisheries Alaska Fisheries Science Center,
4. statistical stock assessments for most non-target species,
5. a tiered system of assessments that provides for more precautionary annual catch limits when assessments use less precise methods and clear procedures exist for restricting catch limits if stock rebuilding is necessary,
6. mandatory use of seabird avoidance devices on all vessels larger than 55', and
7. a spatial management strategy that prohibits or restricts vessels from fishing in sensitive habits.

This system is expected to keep bycatch species at levels that are highly likely to be within biological limits and minimize impacts to habitat. The evidence for successful implementation of this management strategy is manifest by regular (often annual or bi-annual) stock assessment, in season catch accounting and the healthy stock status for most non-target species relative to reference points. According to the council stock status report, there are established empirical reference points for shark, skate and grenadier; all of these species are not overfished nor overfishing is occurring[126].

12.12. Outcome indicator(s) and management objectives for endangered species.

There is a strategy in place to manage endangered species interactions of the sablefish fishery.

Specific regulations to reduce the incidental mortality of, the endangered short-tailed albatross now include the

[126] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

use of streamer (tory) lines, night setting, lineshooters and lining tubes, have been shown to reduce seabird interactions when setting or retrieving gear.

ETP species, seabirds and marine mammals interactions

As previously mentioned, interaction with seabirds and marine mammals are at levels considered to be non-significant, and there are no interaction with ETPs. The short-tailed albatross is currently listed as Endangered under the Endangered Species Act and is protected by the Migratory bird Treaty Act which are implemented by the U.S. Fish and Wildlife Service (USFWS). In order to address the issue of bycatch in commercial fisheries, USFWS works with the National Marine Fisheries Service to set bycatch limits for the short-tailed albatross and implement seabird deterrent measures and requirements to reduce incidental take of seabirds[127]. The USFWS has issued Biological Opinions that address the potential effects of the Alaska Sablefish hook-and-line fishery and the Bering Sea/Aleutian Islands (BSAI) and Gulf of Alaska (GOA) hook-and-line groundfish fisheries on the endangered short-tailed albatross. The USFWS Biological Opinions state that these fisheries are not likely to jeopardize the continued existence of the short-tailed albatross. But because incidental take in the fisheries is possible, an incidental take limit has been established for each fishery. Every 2 years, beginning with 2016-2017, up to 6 short-tailed albatrosses are allowed in the BSAI and GOA groundfish hook-and-line or trawl fisheries. Based on an internet search in June 2017 there does not seem to be any incidental catch in 2016 of short tailed albatross or interactions with Steller sea lions by any of the sablefish fisheries in Alaska.

Most (83%) of the sablefish[128] hook-and-line fishery seabird bycatch occurred in the GOA; the remainder occurred in the BSAI From 2007 through 2015, estimates of the annual seabird bycatch in the BSAI and GOA in this fishery ranged from 227 to 1,868 seabirds, with an annual average of 858 Seabird bycatch is largely Northern fulmars, followed by black-footed albatross, gulls, and Laysan albatross. No Endangered Short Tailed albatrosses were caught in recent years.

The NOAA Alaska Regional Office Protected Resources Division (PRD)[129] is responsible for implementing marine mammal conservation and recovery programs under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) in close coordination with the State of Alaska and other partners.

PRD develops and implements conservation programs for marine mammals including whales, ice seals, harbor seals, northern fur seals, and Steller sea lions; develops and implements recovery programs for threatened and endangered species including Cook Inlet beluga whales, bowhead whales, North Pacific right whales, Steller sea lions, and Arctic ringed seals; coordinates the Alaska Marine Mammal Stranding Network to respond to stranded or entangled marine mammals; consults with federal agencies to minimize the effects of proposed actions on threatened and endangered marine mammals and their critical habitat, such as oil and gas development and coastal construction projects; develops and implements co-management agreements with Alaska Native organizations to cooperatively manage subsistence use of marine mammals; works collaboratively with stakeholders to implement guidelines and practices for marine mammal viewing to avoid harassment; conducts reviews to determine if species warrant protection under the ESA or if ESA-listed species no longer need such protection; and analyzes interactions between marine mammals and commercial fisheries to minimize adverse effects. All marine mammal encounters in these fishery are required to be released without harm. Although

[127] http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management
[128] https://docs.lib.noaa.gov/noaa_documents/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_12.pdf
[129] https://alaskafisheries.noaa.gov/pr

marine mammals such as sea lions are known to interact with halibut longline gear, bycatch is considered non-significant as shown in the most available data available.

There is also an extensive network of protected areas to protect Steller sea lions in Alaska waters and that has been reported in previous clauses.

12.13. Outcome indicator(s) and management objectives for avoiding, minimizing or mitigating the impacts of the unit of certification on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

Evidence

NPFMC Fisheries management plans for BSAI/GOA groundfish fisheries provide clear management guidelines and outcome indicators for the protection of essential fish habitats for many groundfish species and vulnerable habitats. The longline sablefish fishery is not considered to cause harm to essential habitats for the stock under consideration and on other vulnerable habitats. All fishery management plans include a description and identification of essential fish habitat, adverse impacts, and actions to conserve and enhance habitat.

Gulf of Alaska
Also in February 2005, bottom trawling for all groundfish species was prohibited in 10 designated areas along the continental shelf of the Gulf of Alaska. The GOA Slope Habitat Conservation Areas, which are thought to contain high relief bottom and coral communities, total 2,086 nm^2.

Additionally, the Council adopted several new HAPCs. The Alaska Seamount Habitat Protection Area encompasses all 16 seamounts in Federal waters off Alaska, named on NOAA charts, fifteen of which are in the Gulf of Alaska (Brown, Chirkikof, Marchand, Dall, Denson, Derickson, Dickins, Giacomini, Kodiak, Odessey, Patton, Quinn, Sirius, Unimak, and Welker). Bottom-contact fishing is prohibited in all of these HAPCs, an area which totals 5,329 nm^2.

In Southeast Alaska, three sites with large aggregations ("thickets") of long-lived Primnoa coral are also identified as HAPCs. These sites, in the vicinity of Cape Ommaney and Fairweather grounds, total 67 nm^2. The Gulf of Alaska Coral Habitat Protection Area designates five zones within these sites where submersible observations have been made, totaling 13.5 nm^2. All bottom-contact gear (longlines, trawls, pots, dinglebar gear, etc.) is prohibited in this area[130].

Aleutian Islands
In February 2005, the Council adopted several new closure areas to conserve EFH. To minimize the effects of fishing on EFH, and more specifically to address concerns about the impacts of bottom trawling on benthic habitat (particularly on coral communities) in the Aleutian Islands, the Council took action to prohibit all bottom trawling in the Aleutians, except in small discrete "open" areas. Over 95% of the management area is closed to bottom trawling (277,100 nm^2). Additionally, six Habitat Conservation Zones with especially high density coral and sponge habitat were closed to all bottom-contact fishing gear (longlines, pots, trawls). These "coral garden" areas, which total 110 nm^2, are essentially marine reserves. To improve monitoring and enforcement of the Aleutian Island

[130] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

closures, a vessel monitoring system is required for all fishing vessels in the Aleutian management area. Additionally, the Council adopted several new HAPCs. The Alaska Seamount Habitat Protection Area encompasses all 16 seamounts in Federal waters off Alaska, named on NOAA charts, of which one occurs in the Aleutian Islands (Bowers). Bottom-contact fishing is prohibited in this HAPC.

The Aleutian Islands Coral Habitat Protection Area designates six areas where submersible observations of high density coral have been made. All bottom-contact gear (longlines, trawls, pots, dinglebar gear, etc.) is prohibited in these areas. The relatively unexplored Bowers Ridge is also identified as a HAPC. As a precautionary measure, the Council prohibited mobile fishing gear that contacts the bottom within this 5,286 nm^2 area.

Bering Sea
In June 2007, the Council adopted precautionary measures to conserve benthic fish habitat in the Bering Sea by "freezing the footprint" of bottom trawling by limiting trawl effort only to those areas more recently trawled. Implemented in 2008, the new measures prohibit bottom trawling in a deep slope and basin area (47,000 nm^2), and three habitat conservation areas around St Matthew Island, St Lawrence Island, and an area encompassing Nunivak Island-Etolin Strait-Kuskokwim Bay. The Council also established the Northern Bering Sea Research Area that includes the shelf waters to the north of St. Matthew Island (85,000 nm^2). The entire Northern Bering Sea Research Area will be closed to bottom trawling while a research plan is developed[131].

12.14. Outcome indicator(s) and management objectives for dependent predators.

Evidence

Alaska Sablefish are not typically categorized as a key prey species for any single marine predator.

Predators/Competitors: The main juvenile sablefish predators are adult coho and chinook salmon, which prey on young-of-the-year sablefish during their pelagic stage. Sablefish were the fourth most commonly reported prey species in the salmon troll logbook program from 1977 to 1984 (Wing 1985), however the effect of salmon predation on sablefish survival is unknown. The only other fish species reported to prey on sablefish in the GOA is Pacific halibut; however, sablefish comprised less than 1% of their stomach contents (M. Yang, October 14, 1999, NOAA, pers. comm. with SAFE author). Although juvenile sablefish may not be a prominent prey item because of their relatively low and sporadic abundance compared to other prey items, they share residence on the continental shelf with potential predators such as arrowtooth flounder, halibut, Pacific cod, bigmouth sculpin, big skate, and Bering skate, which are the main piscivorous groundfishes in the GOA (Yang et al. 2006). It seems possible that predation of sablefish by other fish is significant to the success of sablefish recruitment even though they are not a common prey item.

Sperm whales are likely a major predator of adult sablefish. Fish are an important part of sperm whale diet in some parts of the world, including the northeastern Pacific Ocean (Kawakami 1980). Fish have appeared in the diets of sperm whales in the eastern AI and GOA. Although fish species were not identified in sperm whale diets in Alaska, sablefish were found in 8.3% of sperm whale stomachs off of California (Kawakami 1980). Sablefish distribution is typically thought to be on the upper continental slope in deeper waters than most groundfish. However, during the first two to three years of their life sablefish inhabit the continental shelf. Length samples from the NMFS bottom trawl survey suggest that the geographic range of juvenile sablefish

[131] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf#page=104

on the shelf varies dramatically from year to year. In particular, juveniles utilize the Bering Sea shelf extensively in some years, while not at all in others (Shotwell et al. 2014). Juvenile sablefish (< 60 cm FL) prey items overlap with the diet of small arrowtooth flounder. On the continental shelf of the GOA, both species consumed euphausiids and shrimp predominantly; these prey are prominent in the diet of many other groundfish species as well. This diet overlap may cause competition for resources between small sablefish and other groundfish species[132].

12.15. Outcome indicator(s) and management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.

Evidence

There are measures to ensure that no fisheries in Alaska affect the structure, process and function of aquatic ecosystems.

NPFMC uses a multi-tier precautionary approach, which includes Optimal Yield and MSY reference points. Optimum Yield (OY) is given as a range for the groundfish complexes in the BSAI and the GOA, and the sum of the TACs of all groundfish species (except P. halibut) is required to fall within the range. To prevent overfishing and ecosystem shifts, NPFMC management objectives include the following measures specific to Optimum Yield:

The OY of the BSAI groundfish complex (consisting of all the FMP managed species/categories) is 85% of the historical estimate of MSY, or 1.4 to 2.0 million mt[133].

The OY of the GOA groundfish complex (consisting of all the FMP managed species/categories) is in the range of 116,000 to 800,000 mt. The upper end of the range is derived from historical estimates of complex wide MSY.

Due to the variety of management measures in place the structure and complexity of foodwebs and ecosystem processes appears to be still in place.

[132] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[133] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Species richness and diversity on the eastern Bering Sea shelf have undergone significant variations (Figure 8) from 1982 to 2016. The average number of species per haul increased by one to two species from 1995 to 2004, remained relatively high through 2011, and both richness and diversity decreased through 2014 with a moderate increase in richness in 2015/2016 and a large and significant increase in Shannon diversity in 2016. Richness tends to be highest along the 100 m isobath, while diversity tends to be highest on the middle shelf. Local richness is lowest along the slope and in the northern part of the survey region, while diversity is lowest in the inner domain[134].

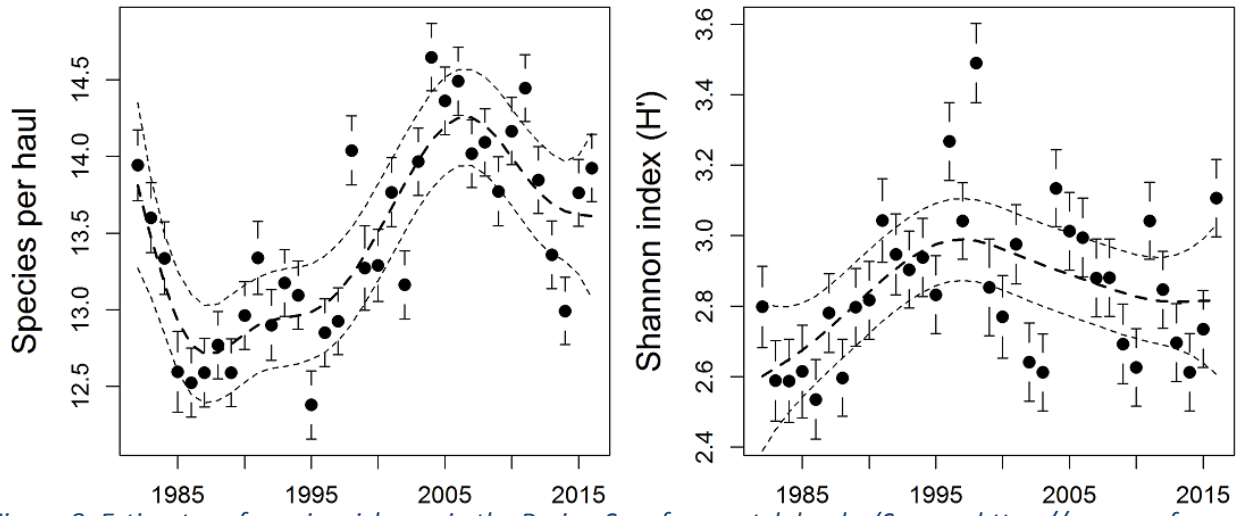


Figure 8: Estimates of species richness in the Bering Sea, from catch hauls. (Source: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf)

Richness and diversity were generally higher in the eastern Gulf of Alaska than in the western Gulf with, on average, 2-3 additional species per haul in the east. Richness has been relatively stable in the western Gulf with relatively low richness in recent years. Local species richness in the eastern Gulf increased substantially in 2013, but declined again in 2015. Diversity in the eGOA has been declining since 2007. Both richness and diversity tend to be highest along the shelf break and slope, with richness peaking at or just below the shelf break (200-300m), and diversity peaking deeper on the slope, as well as in shallow water (< 100m).[135]

[134] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[135] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysGOA.pdf

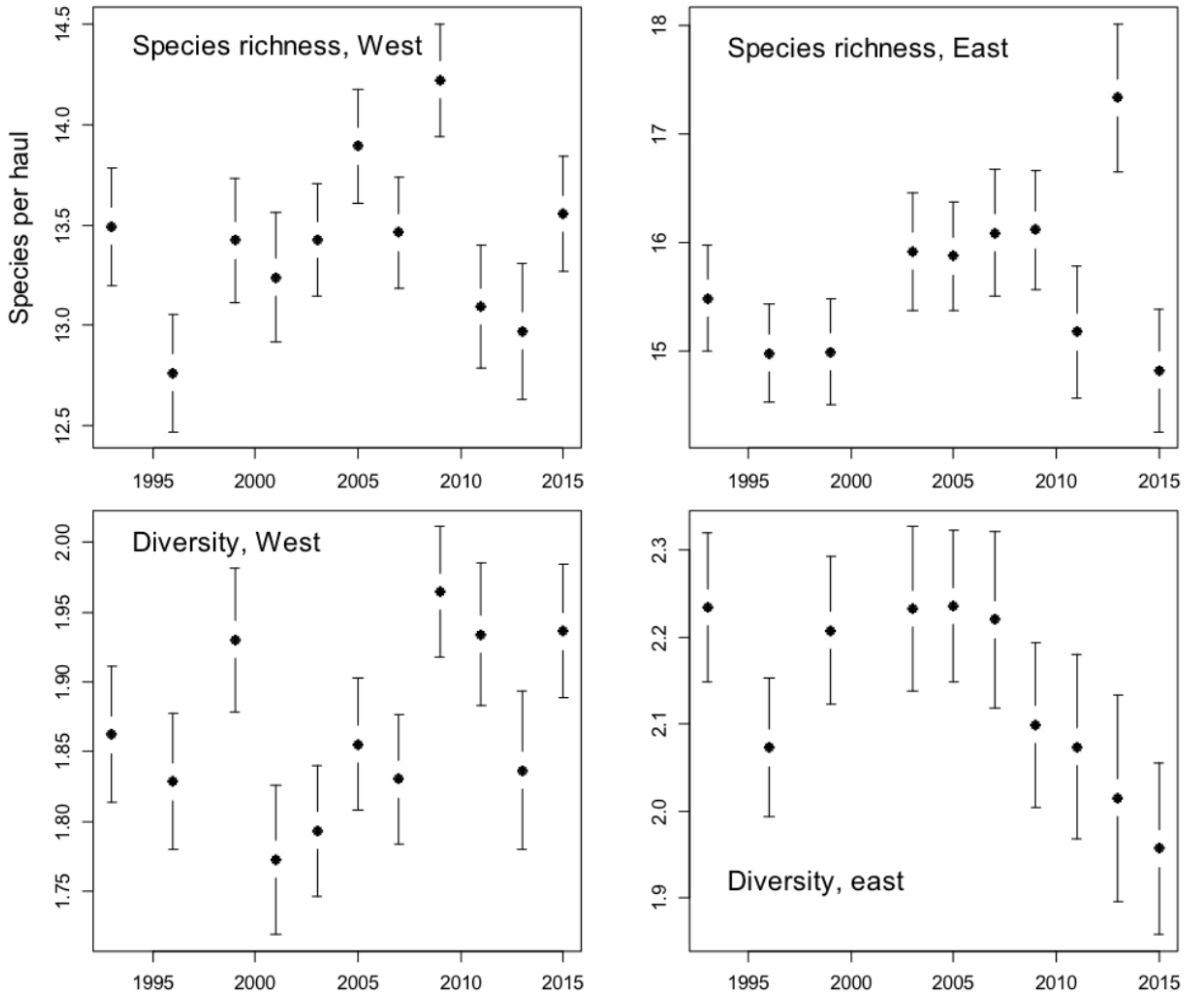


Figure 9: Estimates of species richness in the Gulf of Alaska, from catch hauls. (Source: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf)

In Figure 9, models based on annual averages of species richness (average number of species per haul, top panels) and species diversity (Shannon index, bottom panels) are provided for 1993-2015, with regards to the Western (left) and Eastern (right) Gulf of Alaska based on 76 fish and invertebrate taxa collected by standard bottom trawl surveys with 95% pointwise confidence intervals. Model means were adjusted for differences in depth, date of sampling, and geographic location.

8. Performance specific to agreed corrective action plans

A corrective action plan was not applicable to this fishery because full conformance was demonstrated.

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

Not applicable, full conformance was demonstrated.

10. Future Surveillance Actions

Not applicable, next assessment will be a surveillance assessment in 2018.

11. Client signed acceptance of the action plan

Not applicable, full conformance was demonstrated.

12. Recommendation and Determination

Following this 1st surveillance assessment, finalized in July 2017, the assessment team recommends that continued Certification under the Alaska 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).

13. References

Reference	Hyperlink
2016 North Pacific Groundfish Stock Assessment and Fishery Evaluation Reports for 2017 Fisheries	https://www.afsc.noaa.gov/refm/stocks/assessments.htm
2017 EM Pre-Implementation Plan	http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPreimpPlan.pdf
AFSC Ecosystem Consideration Report series	https://access.afsc.noaa.gov/reem/ecoweb/)
AFSC, ARO 2017	Alaska Fisheries Science Center and Alaska Regional Office. 2017. North Pacific Observer Program 2016 Annual Report. AFSC Processed Rep. 2017-07, 143 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115. Available at http://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf
Alaska Department of Health and Social Services (DHSS)	http://www.iphc.washington.edu/research/biology/environ.html
Alaska Marine Safety Education Association (AMSEA)	http://www.amsea.org/commercial-fishermen
Analysis of fishery CPUE data	https://www.cfec.state.ak.us/
Bering Sea Integrated Ecosystem Research Program	http://www.nprb.org/bering-sea-project
Breiwick 2013	
Crew access to fishing regime	http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf
Definition of Pot gear for all groundfish	https://alaskafisheries.noaa.gov/regs/679a2.pdf http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[JUMP:%275+aac+28!2E050%27]/doc/{@1}?firsthit
DFO and NMFS Cooperation on stock assessment	https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
EM 2016 trial	https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf
Faunce, C.H. 2013.	Faunce, C.H. 2013. The Restructured North Pacific Groundfish and Halibut Observer Program. NOAA quarterly publication. http://docs.lib.noaa.gov/noaa_documents/NMFS/AFSC/TM_AFSC/TM_NMFS_AFSC_281.pdf
Fishers confidentiality agreement	http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section815.htm
Fishing closed areas	Witherell, D. and D. Woodby. 2005. Application of Marine

Reference	Hyperlink
	Protected Areas for Sustainable Production and Marine Biodiversity off Alaska. Marine Fisheries Review 67(1):1-27. http://spo.nmfs.noaa.gov/mfr671/mfr6711.pdf
Fishing vessel participation	https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
Fissel, et. al. 2016	https://www.afsc.noaa.gov/REFM/Socioeconomics/SAFE/groundfish.php
Fournier and Archibald 1982	A General Theory for Analyzing Catch at Age Data; https://doi.org/10.1139/f82-157
Fournier et al. 2012	Fournier, D.A., Skaug, H.J., Ancheta, J., Ianelli, J., Magnusson, A., Maunder, M.N., Nielsen, A. and J. Sibert. 2012. AD Model Builder: using automatic differentiation for statistical inference of highly parameterized.
Gauvin 2013	Gauvin, J., J. Gruver, K. McGauley, and C. Rose. 2013. Salmon Excluder EFP 11-01 Final Report. http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_1101_final_report-1.pdf
Grover and Olla 1990	GROVER, J. J., and **B. L. OLLA**. 1990. The food habits of larval sablefish, *Anoplopoma fimbria*, from the Bering Sea. Fish. Bull., U.S. 88:811-814. Online. (.pdf, 223KB). http://fishbull.noaa.gov/884/grover.pdf
Habitat protection protocols and trawl fishing	http://www.npfmc.org/habitat-protections/gear-modifications/
Hanselman et al 2006; citing McDevitt 1990, Saunders et al. 1996, and Kimura et al. 1998	Alaska Sablefish Assessment for 2006; https://www.researchgate.net/publication/265271817_3_Alaska_Sablefish_Assessment_for_2008
Hanselman et al. 2005a	Hanselman, D.H., C. Lunsford, and C. Rodgveller. 2015a. Assessment of the sablefish stock in Alaska. Stock Assessment and Fishery Evaluation Reports for the Groundfish Resources of the Bering Sea/Aleutian Islands and Gulf of Alaska Regions. North Pacific Fishery Management Council, Anchorage, AK 99501. p. 297-414.
Hanselman et al. 2010	Hanselman, D., Lunsford, C., Rodgveller, C., and Pyper, B. 2010. Stock Assessment and Fishery Evaluation Report. Development of a longline survey abundance index for Alaska sablefish. Alaska Fisheries Science Center, NOAA, National Marine Fisheries Service, Juneau, AK.
Hanselman et al. 2015b	Hanselman, D.H., J. Heifetz, K.B. Echave, and S.C. Dressel. 2015b. Move it or lose it: Movement and mortality of sablefish tagged in Alaska. Canadian Journal of Fish and Aquatic Sciences. 2015, 72(2): 238-251.
Haselman et al 2014	Hanselman, D.H., C. Lunsford, and C. Rodgveller. 2014.

Reference	Hyperlink
	Assessment of the sablefish stock in Alaska. Stock Assessment and Fishery Evaluation Reports for the Groundfish Resources of the Bering Sea/Aleutian Islands and Gulf of Alaska Regions. North Pacific Fishery Management Council, 605 W 4th Ave, Suite 306 Anchorage, AK 99501. pp. 283-424 (GOA report), pp. 575-717 (BSAI Report)
Heifetz and Fujioka 1991	Heifetz, J. and J. T. Fujioka. 1991. Movement dynamics of tagged sablefish in the northeastern Pacific Ocean. Fish. Res., 11: 355-374.
Henry et al 2017	Henry, E., Soderlund, E., Henry, A. M., Geernaert, T., Ranta, A. M., and Kong, T., Forsberg J. 2017. 2016 IPHC fishery-independent setline survey. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2016: 4175-215.
International Convention for the Prevention of Pollution From Ships	https://www.law.cornell.edu/uscode/text/33/1901 http://www.gao.gov/assets/230/228813.pdf
JEA	AWT. 2015. Marine Enforcement Section webpage. 5700 E Tudor Road, Anchorage, AK 99507 http://dps.alaska.gov/awt/Marine.aspx
Kawakami 1980	Kawakami, T. 1980. A review of sperm whale food. Sci. Rep. Whales Res. Inst. 32: 199-218.
Kimura 1990	Kimura, D. K. 1990. Approaches to age-structured separable sequential population analysis. Can. J. Fish. Aquat. Sci. 47: 2364-2374.
Kimura et al. 1998	Kimura, D. K., A. M. Shimada, and F. R. Shaw. 1998. Stock structure and movement of tagged sablefish, *Anoplopoma fimbria*, in offshore northeast Pacific waters and the effects of El Niño-Southern Oscillation on migration and growth. Fish. Bull. 96: 462-481.
Laidig et al. 1997	Laidig, T. E., P. B. Adams, and W. M. Samiere. 1997. Feeding habits of sablefish, Anoplopoma fimbria, off the coast of Oregon and California. In M. Saunders and M. Wilkens (eds.). Proceedings of the International Symposium on the Biology and Management of Sablefish. pp 65-80. NOAA Tech. Rep. 130.
M. Yang, October 14, 1999 and 1993	Yang, M-S. 1993. Food habits of the commercially important groundfishes in the Gulf of Alaska in 1990. NOAA Tech. Memo. NMFS-AFSC-22. 150 p.
Maloney and Heifetz 1997	Maloney, N. E. and J. Heifetz. 1997. Movements of tagged sablefish, Anoplopoma fimbria, released in the eastern Gulf of Alaska. In M. Saunders and M. Wilkins (eds.). Proceedings of the International Symposium on the

Reference	Hyperlink
	Biology and Management of Sablefish. pp 115-121. NOAA Tech. Rep. 130.
March 2017, NMFS proposed rule to implement Electronic Monitoring	https://www.federalregister.gov/documents/2017/03/23/2017-05753/fisheries-of-the-exclusive-economic-zoneoff-alaska-integrating-electronic-monitoring-into-the-north
McFarlane and Beamish 1992	McFarlane, G.A. and Beamish, R.J. 1992. Climatic influences linking copepod production with strong year classes in sablefish (*Anoolopoma fimbria*). Can. J. Fish. Aquat. Sci. 49: 743-753.
MESA	https://www.afsc.noaa.gov/ABL/MESA/mesa_sa_sable_ss.htm
National Bycatch Reduction Strategy	http://npfmc.legistar.com/gateway.aspx?M=F&ID=a6ea1d59-1038-4f85-89ce-29f3dddafa11.pdf
National Environmental Policy Act (NEPA)	https://ceq.doe.gov/nepa/Citizens_Guide_Dec07.pdf
NMFS 2016a	NMFS, 2016. Report on Holding of Individual Fishing Quota (IFQ) by Residents of Selected Gulf of Alaska Fishing Communities 1995 – 2015: https://alaskafisheries.noaa.gov/sites/default/files/reports/ifq_community_holdings_95-15.pdf
North Pacific Research Board	http://www.nprb.org/
Observer Declare and Deployment System (ODDS)	https://chum.afsc.noaa.gov:7104/apex/f?p=140:1
Pacific halibut feeding on sablefish	NOAA, pers. comm. with SAFE author
Pacific States Marine Fisheries Commission	http://psmfc.org
Penalties under the Halibut Act (MSA)	http://www.gc.noaa.gov/documents/Penalty%20Policy_FINAL_07012014_combo.pdf)
Percent Habitat impact by fishing gear	https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
Prince William Sound (PWS) sablefish fishery harvest	http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
Research on sperm whale interactions with the sablefish longline fisheries	http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.research
Sablefish tag recoveries	*https://www.afsc.noaa.gov/quarterly/AMJ2013/AMJ13-Feature.pdf*
SAFE: Assessment of the sablefish stock in Alsaka-2015.	Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (2015). Assessment of the sablefish stock in Alaska. - *https://www.afsc.noaa.gov/REFM/Docs/2015/BSAIsablefish.pdf*
Seafood harvested and processed in the state	http://www.alaskaseafood.org/quality/
Shark and Skates biological reference points	https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIshark.pdf

Reference	Hyperlink
	https://www.afsc.noaa.gov/REFM/Docs/2016/GOAshark.pdf
Shotwell et al. 2014 (and Echave et al 2015)	Assessment of the Thornyhead stock complex in the Gulf of Alaska; https://www.afsc.noaa.gov/REFM/Docs/2015/GOAthorny.pdf and Shotwell, S.K., J. Ianelli, and J. Heifetz. 2014. Thornyhead stock complex. In Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska, p. 839 – 842. North Pacific Fishery Management Council, 605 W 4th Ave, Suite 306 Anchorage, AK 99501. http://www.afsc.noaa.gov/REFM/Docs/2014/GOAthorny.pdf
Sigler et al. 1999	Sigler, M.F., J.T. Fujioka, and S.A. Lowe. 1999. Alaska sablefish assessment for 2000. In Stock assessment and fishery evaluation report for the groundfish fisheries of the Gulf of Alaska. North Pacific Fishery Management Council, Anchorage, AK 99510.
Sigler et al. 2001	Sigler, M. F., T. L. Rutecki, D. L. Courtney, J. F. Karinen, and M.-S.Yang. 2001. Young-of-the-year sablefish abundance, growth, and diet. Alaska Fish. Res. Bull. 8(1): 57-70.
Southeast sablefish subsistence and personal use fishing permits for 2017	http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf Southeast Sablefish Subsistence And Personal Use Fishing Permit And Harvest Reporting Available Online
Sport fishery limits	http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
Sturdevant et al. 2009	Sturdevant, M. V., M. F. Sigler, and J. A. Orsi. 2009. Sablefish predation on juvenile Pacific salmon in the coastal marine waters off southeast Alaska in 1999. Trans. Amer. Fish. Soc. 138: 675-691.
Tanasichuk 1997	Tanasichuk, R. W. 1997. Diet of sablefish, *Anoplopoma fimbria*, from the southwest coast of VancouverIsland. In M. Saunders and M. Wilkins (eds.). Proceedings of the International Symposium on the Biology and Management of Sablefish. pp 93-98. NOAA Tech. Rep. 130.
The Aleutian Islands Coral Habitat Protection Area	https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
The Commercial Fisheries Entry Commission	http://www.alaskaseafood.org/quality/
The Gulf of Alaska Integrated Ecosystem Research Project (IERP	http://gulfofalaska.nprb.org/
The State of Alaska, Department of Labor and	http://www.avtec.edu/

Reference	Hyperlink
Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training and Education Center	
The University of Alaska Sea Grant Marine Advisory Program (MAP	http://seagrant.uaf.edu/map/fisheries/
Tier Systems	Fishery Management Plan for Groundfish of the Gulf of Alaska. 2015. North Pacific Fishery Management Council, 605 W. 4th Avenue, Suite 306, Anchorage, Alaska 99501. http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
Wing 1985	
Wynne et al. 1991, 1992;	STELLER SEA LION (Eumetopias jubatus): Western U. S. Stock Wynne, K. M., D. Hicks, and N. Munro. 1991. 1990 salmon gillnet fisheries observer programs in Prince William Sound and South Unimak Alaska. Annual Rept. NMFS/NOAA Contract 50ABNF000036. 65 pp. NMFS, Alaska Region, Office of Marine Mammals, P.O. Box 21668, Juneau, AK 99802. Wynne, K. M., D. Hicks, and N. Munro. 1992. 1991 Marine mammal observer program for the salmon driftnet fishery of Prince William Sound Alaska. Annual Rept. NMFS/NOAA Contract 50ABNF000036. 53 pp. NMFS, Alaska Region, Office of Marine Mammals, P.O. Box 21668, Juneau, AK 99802. www.afsc.noaa.gov/nmml/PDF/sars/ak2002sest-w.pdf
Yang and Nelson 2000	Yang, M-S. and M. W. Nelson. 2000. Food habits of the commercially important groundfishes in the Gulf of Alaska in 1990, 1993, and 1996. NOAA Tech. Memo. NMFS-AFSC-112. 174 p.
Yang et al. 2006	Resource Ecology & Fisheries Management (REFM) Division; www.afsc.noaa.gov/quarterly/amj2006/divrptsrefm1.htm

14. Appendices

14.1. Appendix 1 – Assessment Team Details

Assessment Team Details

Based on the technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd., is pleased to confirm the 4th Surveillance assessment team members for the fishery as follows:

Dr. Ivan Mateo, Lead Assessor

Dr. Ivan Mateo has over 15 years' experience working with natural resources population dynamic modeling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California and Alaska. He has done research with NMFS Northeast Fisheries Science Center Ecosystem Based Fishery Management on bioenergetic modeling for Atlantic cod He also has been working as environmental consultant in the Caribbean doing field work and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services Ted Stevens Marine Research Institute on population dynamic modeling of Alaska sablefish.

Rohan Smith, Assessor

Rohan is a fisheries industry technical and management analyst with qualifications in Aquaculture and Fisheries Management (BSc University of Portsmouth/Sparsholt College), as well as Marine Science, Fisheries and Technology (MSc North Atlantic Fisheries College). He has conducted research evaluating impacts of different fishing activities on marine environments, including vulnerable marine ecosystems in inshore and offshore (24nm) waters of England. He has developed models and approaches that are used to evaluate interactions of fishing and marine ecosystems. His work also include development of integrated sustainable fisheries management plans for Small Island Fisheries of the Caribbean (Montserrat). During this period he participated in research to gather data on mapping of fishing activity, collating catch composition, recording baseline habitat characterisation, reviewing current fishing and ocean policies, as well as readiness of these fisheries to demonstrate sustainability by pre-assessment against the Marine Stewardship Council (MSC) Fisheries sustainability standard. He has participated in MSC full assessments and Surveillance assessments for; Atlanto Scandian Herring, West of Scotland Herring, North Sea herring, and Northeast Atlantic Mackerel, contributing in capacities across Team Member, Lead Assessor, and Principle 2 expert.

Vito Romito, Assessment Team Support

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,

Pacific 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.