Alaska Responsible Fishery Management Certification

2nd Surveillance Report

For The

Alaska Pacific Sablefish (Black Cod) Commercial Fishery

Client

'Eat on the Wild Side' (FVOA)

Facilitated By

Alaska Seafood Marketing Institute (ASMI)

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Report Code: **AK/SAB/002.2/2018**
Published Date: **16th July 2018**

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Foreword

This report is the 2nd Surveillance Report for the Alaska sablefish federal and state commercial fisheries following initial certification award against this AK 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 1.3 fundamental clauses as the assessment framework.

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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 **2nd Surveillance Report (AK/SAB/002.2/2018)** 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 one externally contracted fishery expert and SAI Global internal staff.
Details of the assessment team are provided in Appendix 1.

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

Assessment Team Details

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1. Introduction

This Surveillance Report documents the 2nd 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 AK RFM Certification Program surveillance assessment.

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

1.1. Recommendation of the Assessment Team

Following this 2nd Surveillance Report 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

The Fishery Applicant Details are as described in Table 1 below.

Table 1. Fishery Applicant Details.

Organization/Company Name:	Eat on the Wild Side (Fishing Vessel Owners' Association (FVOA))
Name	Robert Alverson
Position	Manager
Contact Details:	
Street:	4005 - 20th Ave. West, Room 232
City:	Seattle
State:	Washington
ZIP code:	98199
Country:	USA
Phone:	(206) 283-7735
E-mail Address:	robertalverson@msn.com

3. Units of Certification

The Units of Certification (UoCs) are as described in Table 2 below.

Table 2. Units of Certification (UoCs).

Common across all UoCs			Unique to each UoC	
Species	**Location of Fishery**	**Principal Management Authorities**	**UoC**	**Fishing gear**
Common name(s) ▪ Sablefish ▪ Black cod **Latin name** ▪ *Anoplopoma fimbria*	U.S. 200nm EEZ off Alaska within FAO Major Fishing Area 67	**Federal** ▪ National Marine Fisheries Service (NMFS) ▪ North Pacific Fishery Management Council (NPFMC) **State** ▪ Alaska Department of Fish and Game (ADFG) ▪ Board of Fisheries (BOF)	**1**	Benthic longline
			2	Pot
			3	Bottom Trawl

4. Fishery Observations

4.1. Stock status, landings and TAC update

In the 2017 sablefish stock assessment there were no changes in the assessment methodology (Hanselman et al., 2017). New data included in the assessment model were relative abundance and length data from the 2017 longline survey, relative abundance and length data from the 2016 fixed gear fishery, length data from the 2016 trawl fisheries, age data from the 2016 longline survey and 2016 fixed gear fishery, updated catch for 2016, and projected 2017 - 2019 catches. Estimates of killer and sperm whale depredation in the fishery were updated and projected for 2017 – 2019.

Catches[1]

Annual catches in Alaska averaged about 1,700 t from 1930 to 1957 and exploitation rates remained low until Japanese vessels began fishing for sablefish in the BS in 1958 and the GOA in 1963. Catches rapidly increased during the mid-1960s. Annual catches in Alaska reached peaks in 1962, 1972, and 1988 (Figure 1). The 1972 catch was the all-time high, at 53,080 t, and the 1962 and 1988 catches were 50% and 72% of the 1972 catch. Evidence of declining stock abundance and passage of the MSFCMA led to significant fishery restrictions from 1978 to 1985, and total catches were reduced substantially.

Exceptional recruitment fueled increased abundance and increased catches during the late 1980's, which coincided with the domestic fishery expansion. Catches declined during the 1990's, increased in the early 2000s, and have since declined to near 11,000 t (Figure 1) in 2015. TACs in the GOA are nearly fully utilized, while TACs in the BS and AI are rarely fully utilized (Table 3).

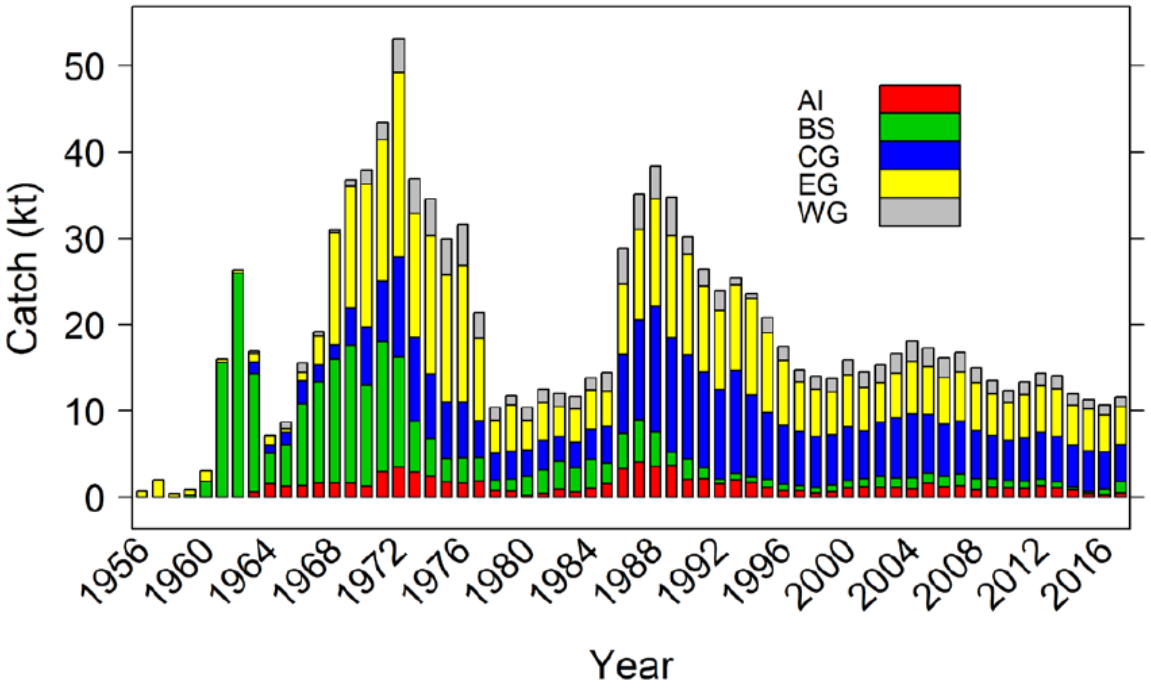

Figure 1. Sablefish fishery total reported catch (kt) by North Pacific Fishery Management Council area and year.

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

Stock Status

Sablefish are managed under Tier 3 of NPFMC harvest rules. Reference points are calculated using recruitments from 1977-2013. The updated point estimates of $B_{40\%}$, $F_{40\%}$, and $F_{35\%}$ from this assessment are 98,332 t (combined across the EBS, AI, and GOA), 0.096, and 0.114, respectively. Projected female spawning biomass (combined areas) for 2018 is 88,928 t (90% of $B_{40\%}$, or $B_{36\%}$), placing sablefish in sub-tier "b" of Tier 3. The maximum permissible value of FABC under Tier 3b is 0.086, which translates into a 2018 ABC (combined areas) of 25,583 t. The OFL fishing mortality rate is 0.102 which translates into a 2018 OFL (combined areas) of 30,211 t.

The 2017 SAFE (Hanselman et al., 2017) estimated the probability that projected sablefish biomass will fall, or stay below thresholds of 17.5% (MSST), 35% (MSY), and 40% (B_{target}) of the unfished spawning biomass. The probability that next year's spawning biomass was below $B_{35\%}$ was 0.40. During the next three years, the probability of being below $B_{17.5\%}$ is near zero, the probability of being below $B_{35\%}$ is low, and the probability of staying below $B_{40\%}$ is also low in the medium term. Based on these values, and comparing the 2016 catch to the 2016 OFL, the sablefish stock is **not being subjected to overfishing, is not currently overfished**, and **is not approaching an overfished condition**.

Instead of maximum permissible ABC, the SAFE authors (Hanselman et al., 2017) recommended a 2018 ABC of 14,957 t, which is 14% higher than the 2017 ABC. The maximum permissible ABC for 2018 is 89% higher than the 2017 maximum permissible ABC of 13,509 t. The authors noted that their recommended ABCs for 2018 and 2019 are lower than maximum permissible ABC for two important reasons. The first is related to uncertainty around the large estimate of the 2014 year class. The second is based on estimates of whale depredation occurring in the fishery, in the same way that was recommended and accepted in 2017.

Table 3. Biomass (4+), TAC and Catch of Sablefish in Gulf of Alaska, Bering Sea and Aleutian Islands Sablefish for 2016-2017.

Area	Year	Biomass (4+)	OFL	ABC	TAC	Catch
GOA	2016	122,000	10,326	9,087	9,087	9,376
	2017	139,000	11,885	10,074	10,074	10,386
	2018	356,000	22,703	11,505		
	2019	370,000	35,989	16,194		
BS	2016	25,000	1,304	1,151	1,151	532
	2017	24,000	1,551	1,274	1,274	1077
	2018	94,000	2,887	1,464		
	2019	98,000	4,576	2,061		
AI	2016	23,000	1,766	1,557	1,557	349
	2017	43,000	2,101	1,735	1,735	469
	2018	65,000	3,917	1,988		
	2019	68,000	6,209	2,798		

4.2. Enforcement update

Sablefish Enforcement Activities: Year 2017

US Coast Guard patrols completed 136 boardings on IFQ fishing vessels targeting halibut and sablefish during year 2017. There were 29 boardings of IFQ sablefish vessels, with no violations detected (Source: USCG).

4.3. Ecosystem Update

There were no significant changes to the ecosystem impacts of the Alaska Sablefish fishery in the last year.

Hanselman et al. (2017) - SAFE document, documents ecosystem effects on the sablefish stock. The sablefish ecosystem and socioeconomic profile (ESP) in the SAFE also provides a synopsis of the ecosystem impacts on the stock and economic performance of the fishery.

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

Prohibited species catches (PSC) in the targeted sablefish fisheries are dominated by halibut and golden king crab. BSAI and GOA halibut catches in 2017 were below the 2012-2017 average, while BSAI golden king crab catches were higher in 2017 than the 2012-2017 average.

2017 Electronic Monitoring Project

Fifty-three longline and pot vessels participated in the 2017 pre-implementation EM project. Some vessels participated in more than one fishery. EM data was collected on 45 sablefish trips.

4.4. Relevant changes to Legislation and Regulations

There were no significant changes to the legislation and Regulations regime that governs the Alaska Sablefish fishery in the last year.

4.5. Relevant changes to the Management Regime

There were no significant changes to the management regime that governs the Alaska Sablefish fishery in the last year.

5. Surveillance Meetings

Table 4. Summary of Meetings with Stakeholders.

Date	Organization and Location	Representative	Main Topics of Discussion
Monday, May 14th 2018, 9:30 AM	Alaska Division Fish and Game (ADFG) 802 3rd Street (1st Floor) Douglas, AK 99824-5412	Karla Bush Janet Rumble Mark Stichert	Sablefish state fisheries management updates.
Monday, May 14th 2018, 3:00 PM	NOAA NMFS Alaska Fisheries Science Center, Ted Stevens Research Institute (NOAA AKFSC) 17109 Pt. Lena Loop Rd. Juneau, AK 99801	Dr. Dana Hanselman Chris Lunsford	Sablefish stock assessment updates.
Tuesday May 15th, 2018, 10:00 AM	USGS Headquarters, Juneau, AK 709 W. 9th St., Rm 420 - Juneau, Alaska 99802-1668	Ivonne Yang Courtney Sergeant Jeffrey J. Schoknecht	Enforcement and compliance activities.
Tuesday May 15th, 2018, 2:00 PM	NOAA Alaska NMFS Regional Office Juneau, AK 709 W. 9th St., Rm 420 - Juneau, Alaska 99802-1668	Mary Furuness Kurt Iverson Ann Marie Reich	Federal sablefish management regulations.
Wednesday May 16th, 2018, 9:30 AM	NPFMC (North Pacific Fisheries Management Council) 605 W 4th Ave, Anchorage, AK 99501	Dave Witherell Diana Stram Sam Cunningham Sara Marrinan	Federal sablefish management regulations.
Friday May 18th, 2018, 12:00 PM	Fishermen terminal Seattle, Washington, USA. 3919 18th Ave W, Seattle, WA 98119	Client Mr. Robert Alverson FVOA	Updates on client action plan, and status of the fisheries.
Monday May 22th, 2018, 1:00 PM	Alaska Wild Trooper 2760 Sherwood Ln, Juneau, AK 99801 CONFERENCE CALL	Alaska State Troopers Lt. Jonathan Streifel	Enforcement activities.

6. Assessment Outcome Summary

6.1. 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. A comprehensive observer program is in place to collect information on sablefish.

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). The BSAI, and GOA groundfish management plans define target and limit reference points and harvest control rules for sablefish and other groundfish. Each Stock Assessment and Fishery Evaluation (SAFE) report describes the current fishing mortality rate, and stock biomass relative to the reference points.

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 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. One change in the fishery, as a result of Amendment 101 to the GOA FMP, allowed the use of longline pots to direct for sablefish in the GOA, beginning in 2017. 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 have 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 have 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 have 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. NPFMC revised the EFH sections of its Fishery Management Plans (FMPs) to address the results of the 5-year review of EFH done in 2015. As of 2018, NPFMC has submitted Amendment 115 to the FMP for Groundfish of the BSAI, Amendment 105 to the FMP for Groundfish of the Gulf of Alaska, as well as amendments

to other FMPs to the Secretary of Commerce for review. If approved, these Amendments would revise the FMPs by updating the description and identification of EFH, and updating information on adverse impacts to EFH based on the best scientific information available.

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 numerous time and area restrictions, including closure areas, have been established and compliance is demonstrated in the fishery.

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

7. 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.

8. Evaluation of Fundamental Clauses

8.1. Section A. The Fisheries Management System

8.1.1. 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 changes have occurred in the management of 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[2]). 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[3]). 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[4].

2017 Updates Relative to Sablefish – 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 work plan 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

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

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 and 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[5]

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[6]. 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 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[7].

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.

[5] https://www.npfmc.org/electronic-monitoring-2/
[6] http://www.aquamaps.org/receive.php?type_of_map=regular
[7] https://www.afsc.noaa.gov/REFM/Docs/2017/GOAsablefish.pdf

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[8] 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[9].

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[10].

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[11] 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.

[8] http://www.psmfc.org/tsc2/
[9] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[10] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
[11] http://www.npfmc.org/council-meeting-archive/

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[12].

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[13].

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 a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions[14]. The Council actively encourages stakeholder participation, and all Council deliberations are conducted in open, public session. As previously discussed, the Three Meeting Outlook[15] 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] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
[13] https://www.npfmc.org/electronic-monitoring-2/
[14] http://www.npfmc.org/council-meeting-archive/
[15] http://www.npfmc.org/wp-content/PDFdocuments/meetings/threemeetingoutlook.pdf

8.1.2. 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 changes have occurred in the management of sablefish fishery in Alaska 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[16] 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[17]. 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)[18]

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.

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

Alaska Department of Fish and Game (ADFG)[19]
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[20]. In addition the framework managing natural renewable resources, in a sustainable manner, is outline in Article 8[21].

Alaskan Department of Natural Resources (DNR)[22]
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)[23]
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)[24]
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)[25]
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
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 which adjudicates appeals of initial administrative determinations. 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.

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

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[26].

The Western Alaska Community Development Quota (CDQ) Program[27]

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[28]

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[29]) 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 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[30]. 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 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

[26] 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

[27] https://alaskafisheries.noaa.gov/fisheries/cdq

[28] https://alaskafisheries.noaa.gov/tribal-consultations

[29] http://dnr.alaska.gov/commis/opmp/anilca/

[30] http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php

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[31]. 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 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.

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.

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)

[31] https://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/communitysnapshots/fullmap.php

- 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[32] and the Bering Sea[33] 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 of sablefish and other marine species in Alaskan waters[34].

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 was the 9th year of the IPHC oceanographic data collection program[35]. Oceanographic data are collected during the IPHC fishery-independent setline survey. The IPHC has operated profilers since 2000 on a limited basis, and coastwide since 2009. Oceanographic data were collected at a total of 1,281 (or 88%) stations out of a possible 1,420. The coldest near-bottom water (-0.82^{o}C) was detected around St. Matthew Island in the Bering Sea. The warmest near-bottom water (13.85^{o}C) was found at a shallow station off of southern Oregon. For the first time in several years, profiler data indicated a severe hypoxic zone off of the Washington coast with dissolved oxygen levels measured as low as 0.069 ml/L. Counts of live seabirds 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 20,921 seabird counts have been conducted over the last 16 years, with 1,368 occurring in 2017.

ADFG Habitat Division[36] 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[37].

[32] http://www.nprb.org/gulf-of-alaska-project/about-the-project/
[33] http://www.nprb.org/bering-sea-project/about-the-project/
[34] http://www.pmel.noaa.gov
[35] https://www.iphc.int/uploads/pdf/am/2018am/iphc-2017-rara27-r.pdf
[36] http://www.adfg.alaska.gov/index.cfm?adfg=habitatresearch.main
[37] http://www.fakr.noaa.gov/habitat/default.htm

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[38]. 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 for the 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 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.

[38] http://www.uscg.mil/hq/cg5/cg531/LMR.asp

8.1.3. 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 changes have occurred in the management of sablefish fishery in Alaska 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[39,40]. 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. 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[41].

[39] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[40] http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[41] www.adfg.alaska.gov/static-f/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groundfish.pdf

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[42].

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 dead loss 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 5) from the 2017 federal SAFE assessment.

Table 5. Sablefish stock assessment update 2017[43].

	As estimated or specified *last* year for:		As estimated or recommended *this* year for:	
Quantity/Status	2017	2018	2018*	2019*
M (natural mortality rate)	0.097	0.097	0.097	0.097
Tier	3b	3b	3b	3b
Projected total (age 2+) biomass (t)	239,244	239,244	330,655	350,850
Projected female spawning biomass (t)	91,553	91,553	88,928	110,974
$B_{100\%}$	264,590	264,590	245,829	245,829
$B_{40\%}$	105,836	105,836	98,332	98,332
$B_{35\%}$	92,606	92,606	86,040	86,040
F_{OFL}	0.097	0.097	0.102	0.114
$maxF_{ABC}$	0.097	0.097	0.086	0.096
F_{ABC}	0.081	0.078	0.077	0.085
OFL (t)	15,931	16,145	30,211	47,891
OFL_w (t)	**15,428**	**15,996**	**29,507**	**46,775**
max ABC (t)	13,509	13,688	25,583	41,044
ABC (t)	13,509	13,688	15,380	21,648
ABC_w (t)**	**13,083**	**13,256**	**14,957**	**21,053**
Status	As determined *last* year for:		As determined *this* year for:	
	2015	2016	2016	2017
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 13,329 t and 18,461 t used in place of maximum permissible ABC for 2018 and 2019. This was done in response to management requests for a more accurate two-year projection.
**ABC_w and OFL_w are the final recommended ABC and OFL after accounting for whale depredation and using the 1977 value for the 2014 recruitment in the projection model.

[42] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[43] https://www.afsc.noaa.gov/refm/stocks/plan_team/2017/GOAsablefish.pdf

8.2. Section B. Science and Stock Assessment Activities

8.2.1. 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

4.1. All fishery removals and mortality of the target stock(s) shall be considered by management. Timely, complete and reliable statistics shall be compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment. Such data shall be updated regularly and verified through an appropriate system. The use of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage, between applied research and fisheries management (e.g. adoption of scientific advice) shall be promoted. Results of analysis shall be distributed accordingly as a contribution to fisheries conservation, management and development.

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. Extensive research related to stock assessment and management of sablefish is conducted by NMFS, and results are presented and published annually in the NPFMC SAFE reports for BSAI and GOA stocks. These annual reports are available on line at NPFMC. In addition, ADF&G does research and stock assessment on the sablefish and other resources under state management.

Commercial fishery catch data are collected from fixed gear (longline and pot) vessels, which target sablefish in the IFQ fishery, plus trawl fisheries that retain bycatch of sablefish in other fisheries such as those for rockfish and sole. NMFS tracks in-season catches and IFQ balances. TACs in the GOA are nearly fully utilized while TACs in the BS and AI are rarely fully utilized. Catch reports for sablefish in 2017 and earlier years can be found on the NMFS Alaskan fisheries website[44]. Sablefish catch data for each area in the state-managed fisheries can be found on the ADF&G commercial fisheries website[45]. Sablefish discards by target fisheries are available for hook-and-line and other gears in Hanselman et al. (2017).

The "eLandings" system[46] is an electronic fish ticket system, for all catch data required to be reported in regulation, including IFQ/CDQ sablefish and halibut. Each industry report submitted via eLandings is checked by NMFS and entered along with observer data into the catch accounting system (CAS) maintained by NMFS. The CAS combines observer and industry information such as e-landings to create estimates of total catch. The CAS procedures have recently changed to complement the sampling procedures established under the restructured observer program.

[44] https://alaskafisheries.noaa.gov/fisheries-catch-landings?tid=287
[45] http://www.adfg.alaska.gov/index.cfm?adfg=fishingcommercialbyarea.main
[46] https://elandings.alaska.gov/

Additional details on the catch reporting and estimation processes can be found in Cahalan et al. (2014), and more information on commercial sablefish catches is in Hanselman et al. (2017).

The Alaska Fisheries Information Network (AKFIN)[47] was established in 1997 in response to an increased need for detailed, organized fishery information to aid decision-making by managers with the aims of consolidating, managing and dispensing information related to commercial fishing in Alaska. The AFKIN maintains an analytic database of both state and federal commercial fisheries data for which is Alaska relevant to the needs of fisheries scientists and other users, and provides that data in usable formats.

By-catches in the directed sablefish fishery are recorded by observers, reported through the CAS, and presented in the annual stock assessments. Main by-catch species in sablefish longline and pot fisheries include grenadier, halibut, rockfish, sharks, and flatfish. More information on bycatch species is contained in Clause 12.4 below. Hanselman et al. (2017) note that removals from the sport fishery are relatively minor for sablefish but have been increasing in recent years, primarily in state-managed waters. Total removals from activities other than the directed fishery have been between 239 and 359 t since 2006, and are documented in the SAFE but not included in the stock assessment model. These catch estimates are approximately 2% of the recommended ABC and are considered by the SAFE authors to represent a relatively low risk to the sablefish stock.

The catches used in the 2017 assessment 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 catch reporting system, which is the source of the catch data used in the assessment. 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 (Hanselman et al., 2017). 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 2017 assessment.

Information on the state fisheries in 2017 in the Southeast Region (Chatham Strait and Clarence Strait), as well as the Prince William Sound area, with comparisons to recent years, can be found in separate reports[48,49] on the ADFG website.

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

Evidence

An extensive industry-funded on-board observer program[50] exists in Alaskan waters to cover various fisheries, including sablefish, 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

[47] http://www.akfin.org/about-akfin
[48] http://www.adfg.alaska.gov/FedAidPDFs/FMR17-54.pdf
[49] http://www.adfg.alaska.gov/FedAidPDFs/FMR17-40.pdf
[50] https://alaskafisheries.noaa.gov/sites/default/files/2017annualreport.pdf

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 calculations. Based on data from NMFS/AFSC/NPFMC, less than 2.5% of the sablefish catch since 2014 was taken by vessels < 40' LOA, so lack of observer coverage in this fishery sector is not a major data gap and does not pose a large risk.

The NPFMC has established an intention to integrate electronic monitoring (EM)[51] 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. A fixed gear EM Workgroup (EMWG) provides a forum for all stakeholders, including the commercial fishing industry, agencies, and EM service providers, to cooperatively and collaboratively design, test, and develop EM systems, consistent with NPFMC's goal to integrate EM into the Observer Program. In April 2018, the Council reconstituted membership on the EM Workgroup to reflect a transition from the development and recent implementation of EM for fixed gear, to a new focus on developing EM systems on trawl catcher vessels in the Bering Sea and Gulf of Alaska. At its June 2018 meeting[52], the Council received an update about fixed gear and trawl EM development from the Electronic Monitoring Workgroup (which has now been renamed the EM Committee) and endorsed preliminary monitoring objectives for trawl EM development.

As part of the 2017 Annual Deployment Plan (ADP) and recognizing the challenging logistics of putting observers on small vessels, NMFS recommended that vessels less than 40' LOA 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 recommended 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 developed by the EM workgroup. NMFS also recommended that vessels participating in the EM selection pool be required to log trips in Observer Declare and Deployment System (ODDS[53]). 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. From information in the 2017 Annual Observer Report (AFSC 2018), EM data was collected on a total of 143 trips from various fisheries in 2017.

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[54]. The Commercial Fisheries Entry Commission[55] 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.

[51] https://www.npfmc.org/observer-program/
[52] https://www.npfmc.org/electronic-monitoring-3/
[53] https://chum.afsc.noaa.gov:7104/apex/f?p=140:1
[54] https://www.afsc.noaa.gov/REFM/Docs/2017/GOAsablefish.pdf
[55] 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[56]. Through the University of Alaska Fairbanks, the state of Alaska also operates the Kodiak Seafood and Marine Science Center[57], which directs efforts in several fields, including seafood processing technology, and seafood quality and safety.

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. 2017)[58]. 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 sablefish, 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 have been part of the evolution of the mature fisheries. Virtually all data from the state and federally managed sablefish fisheries are included in the stock assessments (Hanselman et al., 2017). 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 Alaska 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[59]. Southeast sablefish subsistence and personal use fishing permits for 2017 were available from May 2017[60].

[56] http://www.alaskaseafood.org/quality/
[57] https://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/
[58] https://www.afsc.noaa.gov/REFM/Docs/2017/economic.pdf
[59] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[60] Southeast Sablefish Subsistence And Personal Use Fishing Permit And Harvest Reporting Available Online

4.7. States conducting scientific research activities in waters under the jurisdiction of another State shall ensure 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 2017 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[61]. 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 (Goen et al., 2017)[62].

4.8. States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and shall, where appropriate, support the establishment of mechanisms, including, inter alia, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and shall encourage the sharing of such research results with other regions.

Evidence

As this stock of sablefish is not distributed in high seas areas, there is no research conducted in those waters. Sharing of sablefish information between Canada and USA, for research carried out in their EEZs, is accomplished through the stock assessment process, e.g. results from the stratified random trap surveys conducted in Canadian waters by DFO are available to NMFS scientists and included in the annual SAFE stock assessment reports.

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.

[61] https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-06.pdf
[62] Ibid

8.2.2. 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

5.1 An appropriate institutional framework shall be established to determine the applied research which is required and its proper use (i.e. assess/evaluate stock assessment model practices and/or model) for fishery management purposes. 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. Results of analyses shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research.

Evidence

The mission of the NMFS/AFSC is to conduct scientific research programs which generate scientific data for understanding, managing, and conserving the marine resources and the environmental quality essential for their existence. Appropriate research is conducted for the management of sablefish in Alaska waters. NMFS and ADFG conduct surveys on sablefish in Alaskan waters. The NMFS conducts an annual longline survey and a biennial trawl survey in the GOA 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 CPUE, 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[63].

In the 2017 sablefish stock assessment there were no changes in the assessment methodology (Hanselman et al., 2017) and the only development was the addition of updated data. Full descriptions of the data series and stock assessment methodology are provided in the 2017 SAFE document (Hanselman et al., 2017). The 2017 SAFE continues to include the standard Ecosystem Considerations section, along with a new Ecosystem and Socioeconomic Profile (ESP) which highlights specific ecosystem indicators that may help explain variability in the stock assessment, particularly recruitment.

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

In addition to the annual stock assessment and its related/supporting work, other research programs are ongoing in Alaskan waters which have relevance for the sablefish stock and Alaskan ecosystems. This work includes:

North Pacific Research Board (NPRB)[64]
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[65] 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)[66] 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, Forage Base, Lower Trophic Level and Physical Oceanography, and Ecosystem Modeling.

The Alaska Climate Integrated Modeling (ACLIM) project[67] is a collaboration of diverse researchers aimed at giving decision makers critical information regarding the far-reaching impacts of environmental changes in the Bering Sea. To better predict and respond to future changes, the ACLIM project will develop cutting-edge and multi-disciplinary models. The models will consist of alternative climate scenarios and the associated estimates of potential impacts or benefits to people, industry and the Bering Sea ecosystem. The ACLIM team has 19 members and includes oceanographers, ecosystem modelers, socioeconomic researchers and fishery management experts from NOAA Alaska Fisheries Science Center, NOAA Pacific Marine Environmental Laboratory, the University of Washington Joint Institute for the Study of Atmosphere and Ocean (JISAO) and School of Aquatic and Fishery Sciences (SAFS) and the Norwegian Institute for Water Research (NIVA).

The North Pacific Marine Science Organization (PISCES) is an intergovernmental scientific organization, established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, People's Republic of China, Republic of Korea, the Russian Federation, and the United States of America. Its scientific program named FUTURE[68] (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is an integrative program undertaken by the member nations and affiliates of PICES to understand how marine ecosystems in the North Pacific respond to climate change and human activities.

As part of IPHC's annual setline survey, which provides data for the sablefish assessment, IPHC conducts an

[64] http://www.nprb.org/
[65] http://www.nprb.org/bering-sea-project
[66] http://gulfofalaska.nprb.org/
[67] https://www.afsc.noaa.gov/REFM/REEM/ACLIM.htm
[68] http://meetings.pices.int/Members/Scientific-Programs/FUTURE

extensive oceanographic monitoring program which includes waters off British Columbia, and into the Gulf of Alaska, Bering Sea, and Aleutian Islands (Sadorus and Walker, 2017). The IPHC is collaborating with the Joint Institute for the Study of the Atmosphere and Ocean (JISAO) at the University of Washington and NOAA's Pacific Marine Environmental Laboratory to process the oceanographic data and make them publicly accessible, and a number of years of data up to 2014 are currently available[69].

Also, the Pacific States Marine Fisheries Commission[70] coordinates research activities, monitors fishing activities, collects and maintains databases on marine fish occurring off the California, Oregon, Washington, and Alaska coasts.

Another major ecosystem research report is the AFSC Ecosystem Consideration Report series[71]. 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 2017, 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.

In 2016, NPFMC appointed 12 people to a Plan Team to begin developing the Council's Bering Sea Fishery Ecosystem Plan (FEP). The Team's primary responsibilities were to develop the core FEP document, to discuss potential and ongoing FEP action modules, make recommendations to the Ecosystem Committee and the Council about future steps, and to help communicate results to the Council. While the team is a scientific and technical team, the focus is also to ensure that FEP action modules interface with the Council's management needs, and can be integrated into the Council's decision making and management process. The NPFMC Ecosystem Committee met on February 6, 2018 and reviewed a pre-draft of the Bering Sea Fishery Ecosystem Plan[72], and the Council plans to review the preliminary draft FEP in October, 2018.

At its June 2018 meeting, NPFMC received a summary report[73] on the one-day ecosystem research workshop held on February 7, 2018. The workshop was intended to engage the broader Council community, including Council members, scientific and industry advisors, and stakeholders, in a discussion about how the growing body of ecosystem knowledge can be incorporated into the Council process.

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., 2017) 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.

Various studies have been conducted on the economic value of sportfishing in Alaska (e.g. Lew et al. 2015), which

[69] https://www.ecofoci.noaa.gov/projects/IPHC/efoci_IPHCData.shtml
[70] http://psmfc.org
[71] https://access.afsc.noaa.gov/reem/ecoweb/
[72] https://www.npfmc.org/bsfepfeb2018/
[73] http://npfmc.legistar.com/gateway.aspx?M=F&ID=68e1afcc-0265-4e96-87e6-b1f5551c53a6.pdf

include sablefish, although sablefish is not a major target species for sport fishing. The Alaska Seafood Marketing Institute has contracted studies to determine the value of Alaska's seafood industry, and the University of Alaska, Institute of Social and Economic Research conducts research on the economics of various Alaskan fisheries.

Since 2002 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 sablefish, and are analyzed for organochlorine pesticides, dioxins, furans, polybrominated diphenyl ethers, PCB congeners, methyl mercury and heavy metals (arsenic, selenium, lead, cadmium, nickel, and chromium).

The Oil Spill Recovery Institute (OSRI) was established by US Congress in response to the 1989 Exxon Valdez oil spill. OSRI is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova, AK. The PWS Science Center facilitates and encourages ecosystem studies in the Greater Prince William Sound region. OSRI produces an annual report[74], among other publications. The 2017 report contains details on their activities, including ongoing research projects, an update of field guide for oil spill response in arctic waters, and shore-zone mapping of the eastern Aleutian Islands.

5.2. There shall be established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.

Evidence

The NMFS, ADFG, and University of Alaska maintain established research programs to monitor the state of the sablefish stocks and effects of fishing, pollution, habitat alteration and climate change. These programs are described in Clause 5.1 above.

Alaska's sablefish stock assessment programs (NMFS, ADF&G) are extensive and comprehensive. The process to determine the stock removals used in the assessment and management considerations is explained in Clause 4.1. Research capacity in environmental science is also discussed in Clause 5.1. The program to determine reference points and evaluate the stock against these in a precautionary approach is described in Clauses 6.1, 6.2 and 6.3. Additional information on ecosystem aspects of the stock and fishery is contained in Clause 12.

The state of the sablefish stock is monitored mainly through survey and annual peer-reviewed stock assessment activities. The 2017 assessment showed that longline survey abundance index increased 14% from 2016 to 2017 following a 28% increase in 2016 from 2015 (the lowest point of the time series). The fishery abundance index decreased 23% from 2015 to 2016 (series low). The 2017 fishery data were not available for the 2017 assessment. Results for sablefish from the GOA trawl survey in 2017 increased 89% from the previous survey in 2015. The 2014 year class is estimated to be 2.5 times higher than any other year class observed in the current recruitment series. Spawning biomass is projected to increase rapidly from 2018 to 2022, and then stabilize (Hanselman et al., 2017).

NOAA identifies habitats essential for managed species and conserves habitats from adverse effects on those habitats. These habitats are termed "Essential Fish Habitat" or EFH, and are defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". NMFS and NPFMC must describe and identify EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with

[74] http://www.pws-osri.org/wp-content/uploads/2018/03/FY17-Annual-report.pdf

NMFS, and NMFS must provide conservation recommendations to federal and state agencies regarding actions that would adversely affect EFH. More specific information on EFH and recent activities pertaining to this are described in Clause 12 below.

Ecosystem considerations for Alaska sablefish are available from the yearly SAFE and are summarized in Table 2 along with additional information, in Clause 12.1, below.

For state-managed fisheries, ADF&G has a well-developed research capacity[75] and conducts stock assessments in State waters to determine safe harvest levels. In 1988, the department began annual longline research surveys in both Southeast inside sub-districts where the majority of state fleet fishing effort is focused, in order to assess the relative abundance of sablefish over time and differing environmental conditions. Biological data is also collected during the surveys and ADF&G has standardized its survey methods with the NMFS longline survey. These data are presented and reviewed as part of the overall annual sablefish assessment process, and ADF&G scientists participate in the NPFMC Plan Team. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. For the Clarence and Chatham Strait fisheries (Southeast Inside areas) 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. ADF&G arranges public meetings to present and discuss the scientific findings on these sablefish management areas.

The survey CPUE (per hook) for Chatham Strait increased in 2016 by 10.3% for numbers of fish and 4.5% for weight compared to 2015. From 2016 to 207, the CPUE decreased by 35% in weight, while the CPUE in numbers (abundance) increased by 15% (K. Bush, ADFG – pers. com). In the Clarence Strait stock assessment, analyses revealed a 19% increase in the overall longline survey CPUE index (round lb/hook) from 2015 to 2016, with a further 6% increase in the 2017 survey.

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[76].

5.4. The fishery management organizations shall directly, or in conjunction with other States, develop

[75] http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.research
[76] https://www.afsc.noaa.gov/REFM/Docs/2017/GOAsablefish.pdf

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 NMFS/NPFMC assessment process and SAFE document. The similarly low abundance (through 2014) south of Alaska is of concern, and points to the need to better understand the contribution to Alaska sablefish productivity from B.C. sablefish. Some potential ideas which have been discussed 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[77]. Recent data from Canadian surveys in BC waters have shown an increase in sablefish abundance and biomass.

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)[78], 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 stratum were obtained from a small number of participants.

[77] Ibid.

[78] http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section815.htm

8.3. Section C. The Precautionary Approach

8.3.1. 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

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 in the assessment methodology occurred in 2017, or in the reference point definitions used to manage the fishery. 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 NPFMC tier system[79] specifies the maximum permissible Allowable Biological Catch (ABC) and the Overfishing Limit (OFL). The BSAI and GOA groundfish fishery management plans 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. Each SAFE report describes the current fishing mortality rate, and stock biomass relative to the target and limit reference points

In the NPFMC tier system, the sablefish stock in Alaska is currently managed under Tier 3. Stocks in tier 3 are further categorized as (a), (b), or (c) based on the relationship between biomass, B40%, and a lower value B/B40% <= .05, with (3a) indicating a stock where biomass is above B40%, (3b) indicating a stock where biomass is below B40% but above the lower value, and (3c) indicating a stock where biomass is at or below the lower value. The category assigned to a stock determines the method used to calculate ABC and OFL. The harvest control rule is biomass-based, for which fishing mortality is constant when biomass is above the B40% target and declines linearly down to a threshold value when biomass drops below the target, consistent with the precautionary approach. The rule used to determine the ABC is applied in exactly the same manner, i.e. based on a harvest control rule triggered by targets and limits. If the stock is in Tier 3c, FOFL and maxFABC are set to zero. Note that the MSST threshold used to determine if a stock is overfished is a different reference point than those used in the NPFMC tier system.

The following section on stock rebuilding is from the NPFMC FMP for GOA Groundfish*: Within two years of such time as a stock or stock complex is determined to be overfished, an FMP amendment or regulations will be designed and implemented to rebuild the stock or stock complex to the MSY level within a time period specified at Section 304(e)(4) of the Magnuson-Stevens Act. If a stock is determined to be in an overfished condition, a rebuilding plan would be developed and implemented for the stock, including the determination of an FOFL and FMSY that will rebuild the stock within an appropriate time frame.*

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

The 2017 SAFE (Hanselman et al., 2017) estimated the probability that projected sablefish biomass will fall, or stay below thresholds of 17.5% (MSST), 35% (MSY), and 40% (*Btarget*) of the unfished spawning biomass. The probability that next year's spawning biomass was below *B35%* was 0.40. During the next three years, the probability of being below B17.5% is near zero, the probability of being below B35% is low, and the probability of staying below B40% is also low in the medium term. Based on these values, and comparing the 2016 catch to the 2016 OFL, the sablefish stock is not being subjected to overfishing, is not currently overfished, and is not approaching an overfished condition.

Instead of maximum permissible ABC, the SAFE authors (Hanselman et al., 2017) recommended a 2018 ABC of 14,957 t, which is 14% higher than the 2017 ABC (Please see **Table 3.** Biomass (4+), TAC and Catch of Sablefish in Gulf of Alaska, Bering Sea and Aleutian Islands Sablefish for 2016-2017. above). The maximum permissible ABC for 2018 is 89% higher than the 2017 maximum permissible ABC of 13,509 t. The authors noted that their recommended ABCs for 2018 and 2019 are lower than maximum permissible ABC for two important reasons. The first is related to uncertainty around the large estimate of the 2014 year class. The second is based on estimates of whale depredation occurring in the fishery, in the same way that was recommended and accepted in 2017. Detailed rationale for these decisions is provided in Hanselman et al. (2017).

The SAFE document also recommends the apportionment of the total ABC, based on area-by-area survey biomass estimates for sablefish, into 6 ABC values (2 for BSAI, and 4 for GOA areas). The same proportions were used for 2018 as for the 2017 calculations (Hanselman et al., 2017).

For state-managed sablefish fisheries, the Cook Inlet, Prince William Sound, and the Aleutian Islands state fisheries have guideline harvest limits (GHL) and are managed using NMFS assessment data (and therefore federal reference points), historical catches and effort, projected catch and effort, and a yield-per- unit-area model, among other parameters. For PWS, the 2018 GHL is 133,000 round pounds, an increase of 13.7% from 2017[80].

In Southeast Alaska, for the SSEI area, the Annual Harvest Objective for 2018 was set at 578,774 round pounds, an increase of 12% from 2017. The increase was due to continued increases in the longline survey CPUE index, signs of recruitment in length and age-class distributions in the survey and fishery, introduction of escape rings for pot gear to reduce harvest of immature individuals and increasing trends in sablefish biomass from adjacent areas (K. Bush, ADFG – pers. com).

For the NSEI area, the recommended ABC for the 2017 sablefish fishery was 850,113 round pounds, a 5.3% increase from the 2016 ABC. An F50% biological reference point was used for calculating the 2016 and 2017 ABCs, resulting in a harvest rate of 6.8% in both years. The 2018 ABC for sablefish for the NSEI area was not available at the time this report was prepared.

Although there is not a full suite of reference points for these state-managed sablefish resources, the fisheries continue to be well managed, with recent catches often being less than the specified GHLs.

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

8.3.2. 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

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. In implementing the precautionary approach, States shall take into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions. In the absence of adequate scientific information, appropriate research shall be initiated in a timely fashion.

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 BSAI and the GOA, as a range of values. 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[81,82] 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.

[81] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[82] 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. The sablefish stock is in Tier 3, which means there is 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 state fisheries for sablefish are considered equally precautionary, and are managed consistently with the adjacent federal waters. Measures such as Guideline Harvest Levels and Annual Harvest Objectives are used in setting state-managed catch levels in fisheries for sablefish. State-managed sablefish have some stock assessment based reference points, and/or make use of adjacent federal-based reference points and precautionary approaches where possible. There are no stock enhancements, introduced, or translocated species concerns.

From the 2017 assessment (Hanselman et al., 2017), the probability that next year's spawning biomass was below *B35%* was 0.40. During the next three years, the probability of being below B17.5% is near zero, the probability of being below B35% is low, and the probability of staying below B40% is also low in the medium term. Based on these values, and comparing the 2016 catch to the 2016 OFL, the sablefish stock is not being subjected to overfishing, is not currently overfished, and is not approaching an overfished condition.

This stock assessment explicitly considers uncertainty associated with estimation of model parameters and treatment of the data sources. Assessment results for recruitment, total biomass (2+), and spawning biomass are shown with lower and upper 95% credible intervals (Hanselman et al., 2017). Retrospective analyses are routinely carried out in each stock assessment to examine the consistency among successive estimates of the same parameters obtained as new data are added to a model (i.e. to see if/how much the results of previous stock assessments would differ from the most recent one, if they all were done with the same model).

Future recruitment to a stock usually represents an element of uncertainty around stock productivity, as it is often somewhat unpredictable. As noted in the current sablefish assessment (Hanselman et al., 2017), the 2014 year class is estimated to be 2.5 times higher than any other year class observed in the current recruitment regime. Although there are positive signs of strong incoming recruitment, there are concerns regarding the lack of older fish and spawning biomass, the uncertainty surrounding the estimate of the strength of the 2014 year class, and the uncertainty about the environmental conditions that may affect the success of the 2014 year class. Because of these and other considerations, the SAFE authors assume that the recent recruitment is equal to the previous highest recruitment event in the current regime for projections, which is still 4 times the average level. This results in more precautionary ABC recommendations to buffer for uncertainty until more observations of this potentially large year class are made (Hanselman et al., 2017).

As noted in Clause 6.1, the harvest of sablefish is apportioned into several smaller areas within Alaskan waters, mainly to avoid localized overfishing of the resource. State-managed fisheries operate under catch levels determined specifically for those fisheries. The scientific information available for this resource is of a very high standard. There are long time series of catch and fishery data, as well as fishery independent data, primarily surveys, which provide thorough coverage of the stock area and a wealth of biological data. The annual stock assessments are of excellent quality, are reviewed at multiple levels including being externally reviewed on a regular basis. Details of the data and assessment are in Clauses 4 and 5. In 2016, NMFS requested the Center for Independent Experts (CIE) to conduct a peer review of the agency's stock assessment of Alaska Sablefish; the CIE

reports are available here[83]. Recommendations made in the CIE review were addressed in the 2016 and 2017 stock assessments where possible.

Where data gaps or recommendations for improvements have been identified, NMFS has ongoing research programs capable of addressing these needs. In the 2017 SAFE, there is a detailed section on data gaps and research priorities, outlining six focus areas for future sablefish research. Topics include exploring the use of environmental data to aid in determining recruitment, and developing a spatially explicit research assessment model that includes movement, which will help in examining smaller-scale population dynamics while retaining a single stock hypothesis Alaska-wide sablefish model (Hanselman et al., 2017). Various other studies are conducted, some in collaboration with other agencies, such as the major projects on GOA and BSAI ecosystems funded by NPRB (described in more detail in Clause 5). ADF&G also conducts research and carries out surveys on sablefish in the state-managed waters.

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

Evidence

The sablefish fisheries in Alaska are considered well developed, and entry into the commercial fishery is limited. Any new fisheries/entrants to the fishery are subject to the existing conservation and management measures, which are extensive. New measures governing gear types or operations are subject to a long public advisory process within NPFMC and NMFS and usually require periods of experimental fishing before being implemented.

7.3. Contingency plans shall be agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the fishery resource. Such measures may be temporary and shall be based on best scientific evidence available.

Evidence

There are pre-agreed NPFMC harvest control rules in place to ensure overfishing does not occur on the sablefish stock, as noted in Clause 6. In addition the NPFMC FMPs contain the following specific clause: "In the event that a stock or stock complex is determined to be approaching a condition of being overfished, an in-season action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to prevent overfishing from occurring" [84]. The FMPs also note that information and data relating to stock status may become available to NPFMC during the course of a fishing year which warrants in season adjustments to a fishery. Certain changes warrant swift action by NMFS to protect the resource from biological harm by instituting gear modifications or adjustments through closures or restrictions. Other changes warrant action to provide greater fishing opportunities for the industry by instituting time or area adjustments through openings or extension of a season beyond a scheduled closure. Other in season actions may be necessary for interim fishery closures to reduce prohibited species (e.g. halibut) bycatch rates and the probability of premature attainment of PSC limits.

Section 679.25 of the Federal Fishing Regulations for Fisheries of the Exclusive Economic Zone off Alaska deals with NMFS in-season adjustments. These adjustments include closure, extension, or opening of a season in all or part of a management area; modification of the allowable gear to be used in all or part of a management area; adjustment of TAC and PSC limits; and interim closures of statistical areas, or portions thereof, to directed fishing for specified groundfish species. Any in season adjustment taken must be based on a determination that such adjustments are necessary to prevent one of a number of conditions from occurring, including overfishing of any species or stock of fish or shellfish[85].

[83] https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2016
[84] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[85] https://alaskafisheries.noaa.gov/sites/default/files/part679_all.pdf

8.4. Section D. Management Measures

8.4.1. 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. Management targets are consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators. 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)[86] 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[87][88] 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 HCRs.

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.

[86] http://www.nmfs.noaa.gov/sfa/magact/
[87] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[88] 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 measures regarding sablefish include: Management units (4 in GOA, 2 in BSAI), quota allocation (by fixed and trawl gears), IFQ management beginning in 1995 for sablefish, maximum retainable allowances for sablefish in other fisheries, and allowable gears. 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. Regulations came into force in 2017 as Amendment 101 to the GOA FMP. The development of this gear type in the Gulf of Alaska will be fully monitored.

NPFMC uses a multi-tier precautionary approach to management, which includes Optimum Yield (multi-species) and MSY (single species) reference points for the management of groundfish, including sablefish, in the GOA and BSAI areas. The OY takes into consideration the total amount of fish that can be harvested from each area. State-managed sablefish fisheries use federal-based reference points where possible. NPFMC FMPs for Alaskan groundfish recognize the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long- term health of the resource and the optimization of yield. The annual FMPs include a section on the economic and socioeconomic characteristics of the fisheries and communities in Alaska. Harvest levels for each groundfish species or species group set by NPFMC are based on the best biological, ecological, and socioeconomic information available.

Multiple studies have demonstrated the impact on fishing capacity of introducing the IFQ program in 1995. The number of active vessels participating in the sablefish IFQ program declined by almost 50% in 20 years, from 581 in 1995 to 296 in 2016 (Fissel et al. 2017). Detailed reports on fishing capacity, are completed annually by NMFS. NPFMC and NMFS hosted a workshop in April 2016 to get better information on how the implementation of the IFQ program affected crew members and the evolution of crew employment since IFQ implementation[89].

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. When deciding on use, conservation and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements shall be made to consult all the interested parties and gain their collaboration in achieving responsible fisheries.

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.

[89] http://npfmc.legistar.com/gateway.aspx?M=F&ID=95fe5ec2-18f3-44bc-bcd9-7944aa41fc1b.pdf

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[90].

In June, 2018, NPFMC established its Community Engagement Committee[91]. This was is established to identify and recommend strategies for the Council and Council staff to enact processes that provide effective community engagement with rural and Alaska Native Communities. Effective community engagement may involve two-way communication between the Council and communities at additional stages of the Council process or a project and allow for community concerns, information, perspectives, and priorities to be shared clearly with the Council, whether part of an active Council action or not.

The Western Alaska Community Development Quota (CDQ)[92] 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 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[93].

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. The number of vessels participating in the fleet has decreased by over 50% since implementation of the IFQ program in 1993[94]. Annually, NMFS issues eligible QS holders an IFQ fishing permit that

[90] http://www.npfmc.org/committees/rural-outreach-committee/
[91] https://www.npfmc.org/community-engagement/
[92] http://www.npfmc.org/community-development-program/
[93] http://www.boards.ADF&G.state.ak.us/bbs/what/prps.php
[94] https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf

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, eliminating derby-style fisheries and reducing wastage. 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[95] .

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 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 ES-2 for those measures relevant to sablefish in the GOA FMP[96]). 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[97]. 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.

Regarding 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 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. 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.

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.

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

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[98]. 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[99],[100] 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 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[101,102] .

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.

[98] https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf

[99] https://alaskafisheries.noaa.gov/regs/679a2.pdf

[100] 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

[101] http://www.npfmc.org/fishery-management-plans/

[102] https://www.federalregister.gov/regulations/0648-BB76/amendment-89-to-the-gulf-of-alaska-groundfish-fishery-management-plan-area-closures-for-chionoecetes

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 counted against 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 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

Only about 10% of the total catch of sablefish is taken by trawls. 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 2013). An example of an EFP for this fishery can be found here[103]. In its June 2018 meeting, the NPFMC received an update from NMFS concerning an ongoing deck sorting analysis[104]. NMFS is developing a proposed regulatory amendment to implement voluntary halibut deck sorting on trawl catcher processors when operating in non-pollock groundfish fisheries off Alaska. The proposed amendment is derived from the exempted fishing permits (EFPs) issued by NMFS.

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[105], as noted in the previous clause. 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 seabed and limit adverse impacts of trawling on the seafloor. Considerable research has also lead to some Alaskan trawl fisheries using salmon excluder devices to avoid bycatch of PSC salmon such as chinook (Gauvin et al. 2013).

Groundfish pots 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[106] 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[107], 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;

[103] https://alaskafisheries.noaa.gov/sites/default/files/efp2016-01-050616permit.pdf
[104] https://www.npfmc.org/deck-sorting-analysis-updates/
[105] http://www.npfmc.org/habitat-protections/gear-modifications/
[106] https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf.
[107] http://npfmc.legistar.com/gateway.aspx?M=F&ID=a6ea1d59-1038-4f85-89ce-29f3dddafa11.pdf

- 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[108]. 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[109]. Many of the studies and subsequent implementation have involved cooperative efforts between researchers at institutions in NMFS, DFO, IPHC, universities, and industry. Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of NPFMC, NOAA/NMFS, and IPHC (for sablefish longline fishers who also fish for halibut), and through various meetings, mailouts, etc. Fishing gear is regulated and monitored through these agencies, and data on compliance is recorded and published. There is no evidence that regulations involving gear selectivity are being circumvented either directly by omission, or through the use of gear technology.

Use of longline gear in the sablefish fisheries substantially reduces the impact on bottom habitats and bycatch of many bottom dwelling species. Longline is typically not associated with as much ghost fishing as some other fishing gears, such as gillnets and some types of traps (NOAA 2015). Clause 12.3 contains more information on the main bycatch species taken in the sablefish fisheries. Several measures have been introduced to reduce bycatch/waste and improve the selectivity of fisheries for sablefish. NMFS regulations requires that each pot used to fish for sablefish be equipped with a biodegradable panel at least 18 inches (45.72 cm) in length and sewn up with untreated cotton thread, the effects of which reduce the ability of lost sablefish pots to ghost-fish.

New fishing gears have seldom been allowed for sablefish fishing, where the fishery is long established and longline is the dominant/preferred method of capture. In 2015, the NPFMC recommended that the Secretary of Commerce approve regulations to allow the use of longline pot gear in the Gulf of Alaska (GOA) sablefish IFQ

[108] http://www.npfmc.org/wp-content/PDFdocuments/bycatch/Bycatchflyer913.pdf
[109] http://www.npfmc.org/goa-trawl-bycatch-management/

fishery, largely to counteract whale depredation in these fisheries, and these regulations came into effect as Amendment 101 to the GOA FMP in 2017[110]. As reported in NPFMC documentation[111], 277 catcher vessels fished GOA IFQ sablefish in 2017, 245 using only hook and line (HAL) gear (7,364 t of sablefish caught), 5 using only pot gear (240 t), and 17 using both (238 t in HAL, 652 t in pots). Of the 22 vessels in total which used pot gear in their reported harvest of sablefish, 14 of the vessels retained halibut, totaling 18.6 mt of halibut, or 3% of the sablefish catch weight.

Before the recent proposal to allow a small number of BSAI fishers using sablefish pots and traps to retain halibut, a comprehensive review was conducted within NPFMC, which included extensive dialogue between NPFMC and IPHC[112]. The following text is from the June 2018 Council Newsletter[113], following its June 2018 meeting: "After reviewing the initial review analysis for halibut retention in pots in the BSAI, the Council revised its purpose and need statement and chose a preliminary preferred alternative (PPA). The PPA would allow retention of halibut in pots in the BSAI, if participants have sufficient halibut IFQ or CDQ for the appropriate regulatory area. The Council recommended the analysis be released for public review pending certain changes and additions. … The Council requested that prior to releasing a new draft, staff address changes to the current motion and incorporate the Council's comments, including a discussion of how gear retrieval and storage requirements would impact the existing BSAI sablefish pot fishery. Due to concerns over bycatch, particularly Pribilof Islands Blue King Crab, the Council also asked staff to further explore potential crab escapement mechanisms in halibut pots. Additionally, the Council requested that staff develop a list of potential topics to review regarding the effects of allowing retention of halibut in pot gear, which would be reviewed by the Council three years after implementation of a halibut pot fishery in the BSAI."

Both Canada and USA fish sablefish in the North Pacific. The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off the West Coast. The TSC meets annually, reviews the effectiveness of existing regulations, and allows exchange of information on the status of groundfish stocks of mutual concern and to coordinate wherever possible programs of research, such as surveys, age reading, gear research, etc. Their reports can be found here[114].

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

Not applicable to sablefish.

[110] https://www.federalregister.gov/documents/2017/02/07/2017-02463/fisheries-of-the-exclusive-economic-zone-off-alaska-allow-the-use-of-longline-pot-gear-in-the-gulf
[111] http://npfmc.legistar.com/gateway.aspx?M=F&ID=053d586a-3053-434f-b539-e8eaf01a39a2.pdf
[112] http://npfmc.legistar.com/gateway.aspx?M=F&ID=7d531a12-e2df-4f1c-b22f-29df93f5422a.pdf
[113] https://www.npfmc.org/bsai-halibut-in-pots/
[114] http://www.psmfc.org/tsc2/

8.4.2. 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

Evidence:

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

No significant change has occurred with regard to training and education in the 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[115].

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[116]. 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 form of seminars and workshops[117]. 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 career, .through three days of intensive training. In 2017, the AYFS coincided with the North Pacific Fisheries Management Council December meeting in Anchorage, and included sessions on Science and Management of Alaska's fisheries, and the Regulatory Process[118].

[115] http://www.nmfs.noaa.gov/sfa/management/catch_shares/about/documents/ak_halibut_sablefish.pdf
[116] http://www.avtec.edu/
[117] http://seagrant.uaf.edu/map/fisheries/
[118] https://docs.google.com/document/d/1lAh1pe9LSVahEAoE4farU02keWb-UGD65kbY_8dioRM/edit#heading=h.j4xp17zdb26f

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[119].

Data on the number and location of Alaskan of fishers, permits issued, etc. can be found in Fissel et al. 2017. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network for Alaska Fisheries (AKFIN)[120] . Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's CFEC website[121].

[119] http://www.amsea.org/commercial-fishermen
[120] http://www.akfin.org/home/
[121] https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

8.5. Section E. Implementation, Monitoring and Control

8.5.1. 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.

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.

Sablefish Enforcement Activities: Year 2017

US Coast Guard patrols completed 136 boardings on IFQ fishing vessels targeting halibut and sablefish during year 2017. There were 29 boardings of IFQ sablefish vessels, with no violations detected (Source: USCG).

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)[122].

Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission website[123]. 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.

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

8.5.2. 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 6) are as follows[124]:

Table 6. Offence level and penalty matrix according to the MSA.

	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*
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 *

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

OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL).

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[125].

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

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

8.6.1. 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

12.1. States shall assess the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and assess the relationship among the populations in the ecosystem.

The 2017 SAFE reported extensively on ecosystem effects on the sablefish stock (Hanselman et al. 2017) with the sablefish ecosystem and socioeconomic profile (ESP) providing a synopsis of the ecosystem impacts on the stock and the economic performance of the fishery; the below, along with Table 7, are directly from the 2017 SAFE:

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 nearshore southeast Alaska, juvenile sablefish (20-45 cm) diets included fish such as Pacific herring and smelts and invertebrates such as krill, amphipods and polychaete worms (Coutré et al., 2015). In late summer, juvenile sablefish also consumed post-spawning pacific salmon carcass remnants in high volume, revealing opportunistic scavenging (Coutré et al., 2015). In the GOA, fish constituted 3/4 of the stomach content weight of adult sablefish with the remainder being invertebrates, such as euphausiids, shrimp, and cephalopods (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.). 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 items are also 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.

Table 7. Ecosystem considerations, 2017 sablefish SAFE (Source: Table 3.19, Hanselman et al., 2017).

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

Extensive research on environmental effects on the ecosystem is also conducted by other agencies, and/or described in other reports, as noted in Clause 5.1 above. Major programs include the Bering Sea Integrated Ecosystem Research Program, and the Gulf of Alaska Integrated Ecosystem Research Project, both of which involve the NPRB. Another major ecosystem research report is the AFSC Ecosystem Consideration Report series[126]. These annual reports include ecosystem assessments and ecosystem-based management indicators that together provide context for ecosystem-based fisheries management in Alaska.

12.2 Adverse environmental impacts on the resources from human activities shall be assessed and, where appropriate, corrected.

Evidence

The, NPFMC and NOAA/NMFS conduct assessments and research related to fishery impacts on ecosystems and

[126] https://access.afsc.noaa.gov/reem/ecoweb/

habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document[127], 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)[128].

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). In recent years in the Bering Sea[129], 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. As noted in Clause 8 above, gear modifications have been implemented to reduce the impacts of trawl fisheries, e.g. raising the bobbins from the seafloor.

The directed sablefish fishery takes significant amounts of grenadiers, arrowtooth flounder, spiny dogfish, sharks and 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. The effects of lost/abandoned gear have been studied, and longlining is typically not associated with as much ghost fishing as some other fishing gears, such as gillnets and some types of traps (NOAA 2015).

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 are presented in detail in the annual SAFE documents. The sections below are taken directly from the 2017 SAFE (Hanselman et al., 2017).

Fishery-specific contribution to bycatch of prohibited species, forage species, Habitat Areas of Particular Concern (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 2017 were below the 2012-2017 average, while BSAI golden king crab catches were higher in 2017 than the 2012-2017 average. 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 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.

[127] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[128] https://ceq.doe.gov/docs/get-involved/Citizens_Guide_Dec07.pdf
[129] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf

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 of longlines 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 various species in the targeted sablefish fishery (Table 8, Table 9, and Table 10 below).

Table 8. Bycatch of FMP groundfish species in the targeted sablefish fishery, averaged from 2012-2017. (Source: Table 3.5 in Hanselman et al. 2017 SAFE). Data from AKFIN, to Oct 1, 2017). Other gear = pot + trawl combined because of confidentiality.

	Hook and Line			Other Gear			All Gear		
Species	Discard	Retained	Total	Discard	Retained	Total	Discard	Retained	Total
GOA Thornyhead Rockfish	219	451	670	6	24	31	225	476	701
Shark	454	1	454	0	0	0	454	1	455
GOA Shortraker Rockfish	159	100	259	10	1	12	169	102	271
Arrowtooth Flounder	156	14	170	64	11	74	220	25	244
GOA Skate, Other	192	2	194	1	0	1	193	2	195
GOA Skate, Longnose	182	12	194	0	0	0	183	12	194
GOA Rougheye Rockfish	84	83	168	1	2	3	85	85	170
Other Rockfish	63	68	131	1	1	2	63	69	132
Pacific Cod	64	37	100	0	3	4	64	40	104
BSAI Skate	51	1	52	0	0	0	51	1	52
GOA Deep Water Flatfish	14	0	14	22	7	29	35	8	43
Greenland Turbot	19	12	31	3	1	3	22	13	35
BSAI Kamchatka Flounder	16	2	17	2	4	6	18	5	23
Pollock	2	0	2	9	6	15	12	6	18
Sculpin	15	0	15	0	0	0	16	0	16
BSAI Other Flatfish	6	0	6	1	9	9	7	9	15
GOA Demersal Shelf Rockfish	1	10	11	0	0	0	1	10	11
BSAI Shortraker Rockfish	6	3	9	0	0	0	7	3	10
GOA Skate, Big	8	1	8	0	0	0	8	1	8
Pacific Ocean Perch	2	0	2	1	5	5	3	5	8
GOA Rex Sole	0	0	0	6	1	7	6	1	7
Octopus	6	0	6	1	0	1	6	0	6
GOA Shallow Water Flatfish	4	0	4	0	1	1	4	1	5

Table 9. Bycatch of non-target species and HAPC biota in the targeted sablefish fishery, averaged from 2012-2017. (Source: Table 3.6 in Hanselman et al., 2017 SAFE. Data from NFMS CAS, via AKFIN, to Oct 1, 2017).

	Estimated Catch (mt)						
Group Name	2011	2012	2013	2014	2015	2016	2017
Benthic urochordata	0.13	1.24	0	0	0.49	0	1.03
Brittle star unidentified	0.47	4.65	0.10	0.67	2.09	0.34	0.52
Corals Bryozoans	5.65	7.64	12.67	5.15	4.51	5.97	1.43
Eelpouts	0.64	0.63	1.13	0.79	0.24	1.08	3.29
Grenadiers	8,464	8,555	11,523	5,985	5,805	7,402	5,081
Invertebrate unidentified	2.26	7.72	0.18	0.11	0.55	0.21	0.10
Large sculpins	0	5.16	0	0	0	0	0
Misc crabs	5.51	0.33	5.84	6.39	3.50	4.87	3.92
Misc fish	8.81	10.93	31.43	27.44	17.62	16.01	15.61
Scypho jellies	0.68	0.00	0.00	5.50	0.24	0.18	0.02
Sea anemone unidentified	3.53	1.02	0.95	3.10	14.25	1.79	1.57
Sea pens whips	1.66	0.28	0.36	2.26	2.86	1.29	0.96
Sea star	3.74	3.11	15.76	11.47	9.68	9.02	18.02
Snails	19.68	12.16	8.83	3.68	3.37	0.18	2.37
Sponge unidentified	2.14	0.97	3.39	1.67	3.48	0.50	0.68
State-managed Rockfish	0	0	0.14	0.12	0.09	0.22	0.67
Urchins, dollars, cucumbers	0.26	0.79	0.87	0.79	2.49	0.22	0.18

Table 10. Prohibited Species Catch (PSC) estimates 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: Table 3.7 from Hanselman et al., 2017 SAFE, Data from NMFS AKRO Blend/Catch Accounting System via AKFIN, October 1, 2017).

BSAI								
Hook	Year	Bairdi	Chinook	Golden KC	Halibut	Other salmon	Opilio	Red KC
and	2012	5	4	286	35	0	6	43
Line	2013	0	0	17,055	11	0	121	0
	2014	365	0	858	20	0	314	0
	2015	0	0	3,572	7	0	1,689	0
	2016	0	0	29,032	1	0	26	0
	2017	142	0	11,697	6	0	14	18
	Mean	565	0	15,789	14	0	351	62
Other	2012	179	0	13,000	10	0	419	13
	2013	183	4	13,287	45	0	425	56
	2014	5	4	286	35	0	6	43
	2015	0	0	17,055	11	0	121	0
	2016	365	0	858	20	0	314	0
	2017	0	0	3,572	7	0	1,689	0
	Mean	0	0	29,032	1	0	26	0
BSAI Mean		183	4	13,287	45	0	425	56
GOA								
Hook	2012	0	0	23	602	0	0	0
and	2013	82	0	93	272	0	0	21
Line	2014	6	0	39	250	0	0	0
	2015	164	0	38	292	0	0	12
	2016	0	0	39	277	0	0	0
	2017	25	0	72	301	0	0	0
	Mean	46	0	51	333	0	0	6
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	2	0	47	11	0	0	0
	2017	162	0	0	10	0	0	0
	Mean	5	0	15	6	2	0	0
GOA Mean		78	0	63	340	2	0	6

As noted in Clause 8 above, NMFS has a National Bycatch Reduction Strategy which is intended to guide and coordinate efforts to reduce bycatch and bycatch mortality in the coming years.

Giant grenadier

At least seven species of grenadier are known to occur in Alaskan waters, but only three are commonly found at depths shallow enough to be encountered in commercial fishing operations or in fish surveys: giant grenadier, Pacific grenadier, and popeye grenadier (Rodgveller and Hulson, 2014). Of these, giant grenadier has the shallowest depth distribution and the largest apparent biomass, and hence is by far the most frequently caught grenadier in Alaska. Giant grenadiers make up the bulk of the non-target species bycatch in the sablefish fisheries. In the introduction to the BSAI SAFE document in 2016, prepared by the BSAI Plan Team, an abbreviated grenadier assessment is provided in Appendix 1 (see Table 11). NPFMC noted that while this was not required, it is provided to assist the Council in tracking abundance of the assemblage in the groundfish FMPs. Amendments 100/91 in 2014 added the grenadier complex into both GOA and BSAI FMPs as Ecosystem Components. Under this rule, they are not allowed to be targeted but there is an 8% Maximum Retainable Allowance (MRA). As an Ecosystem Component, a stock assessment is not required. A Tier 5 status is not determined, nor ABCs and OFLs set for

Ecosystem Component species or complexes. However, Tier 5 methods are used for the grenadier complex to estimate ABC and OFL values to monitor the complex. The OFL and ABC values listed for 2017 and 2018 are those recommended by the Plan Team. Catch data were through November 5, 2016. Based on the Tier 5 criteria, overfishing of grenadier is not occurring in either the BSAI or GOA.

Table 11. Assessment information on grenadier in BSAI and GOA. (Source: Appendix 1, BSAI Introduction Section, SAFE document, Dec 2016[130].)

Area	Year	Biomass	OFL	ABC	TAC	Catch
BSAI	2015	1,286,734	100,365	75,274	n/a	2,403
	2016	1,286,734	100,365	75,274	n/a	2,985
	2017	1,197,110	93,375	70,031	n/a	n/a
	2018	1,197,110	93,375	70,031	n/a	n/a

Area	Year	Biomass	OFL	ABC	TAC	Catch
GOA	2015	524,624	40,921	30,691	n/a	6,513
	2016	524,624	40,921	30,691	n/a	7,256
	2017	507,888	39,615	29,711	n/a	n/a
	2018	507,888	39,615	29,711	n/a	n/a

Sharks

The shark complexes (Pacific sleeper shark, spiny dogfish, salmon shark and other/unidentified sharks) in both BSAI and GOA are assessed on a biennial stock assessment schedule in even years, so there was no updated stock assessment in 2017, and evaluation here was based on the 2016 information. BSAI sharks are a Tier 6 complex with the OFL based on maximum historical catch between the years 2003-2015. The stock complex was not subject to overfishing last year, and data do not exist to determine if the species in the complex are overfished[131]. 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 OFL for the species complex 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 because the OFL has not been exceeded[132].

Thornyhead rockfish

For the 2018 fishery, GOA SAFE authors recommend the maximum allowable ABC of 2,038 t for thornyhead rockfish[133], up 3.9% from the previous year. The stock was not being subjected to overfishing last year.

Shortraker rockfish

Assessments for shortraker rockfish were conducted in 2016 for BSAI[134] and in 2017 for GOA[135]. Both assessments conclude there was no overfishing occurring in the most recent year evaluated.

[130] https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIintro.pdf
[131] https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIshark.pdf
[132] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAshark.pdf
[133] https://www.afsc.noaa.gov/REFM/Docs/2017/GOAthorny.pdf
[134] https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIshortraker.pdf
[135] https://www.afsc.noaa.gov/REFM/Docs/2017/GOAshortraker.pdf

Results from the 2017 Electronic Monitoring Project

Fifty-three longline and pot vessels participated in the 2017 pre-implementation EM project. Some vessels participated in more than one fishery. EM data was collected on 55 halibut trips, 43 Pacific cod trips, and 45 sablefish trips containing a total of 12,467 hauls (Table 12). The data spanned 259 halibut sea days, 185 Pacific cod sea days, and 262 sablefish sea days for a total of 706 sea days with trips averaging 4.9 days across all fisheries.

Table 12. Summary of EM monitored fishing activity for 2017. (Source: 2017 Observer Report[136]).

	Halibut Target		Pacific Cod Target		Sablefish Target			All Fisheries
	Fixed Hook Longline	Snap Longline	Single Pot	Snap Longline	Fixed Hook Longline	Snap Longline	String Pot	
Vessels	23	18	5	8	19	4	1	**53**
Trips	29	26	23	20	34	6	5	**143**
*Reviewed Trips**	13	9	17	19	16	1	1	**76**
Hauls	249	154	11,420	243	249	97	55	**12,467**
Reviewed Hauls	78	52	2,489	225	89	10	11	**2,954**
Sea Days	162	97	105	80	177	48	37	**706**
Average Trip Length (Days)	5.6	3.7	4.6	4.0	5.2	8.0	7.4	**4.9**

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[137].

Habitat effects

As previously mentioned, 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[138]. 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)[139]. For an update on the 2015 EFH Review, see Clause 12.9 below.

ETP species, seabirds, and marine mammal 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[140].

[136] http://www.afsc.noaa.gov/Publications/ProcRpt/PR2018-02.pdf
[137] http://www.psmfc.org/tsc-drafts/2017/ADFG_2017_AK_TSC_Alaska_FINAL.pdf
[138] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[139] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[140] http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management

The USFWS consulted with NOAA Fisheries Alaska Region under section 7 of the ESA on the effects of the groundfish and halibut fisheries on the endangered short-tailed albatross. In both its 2015 (groundfish) and 2018 (halibut) biological opinions, the USFWS determined the groundfish and halibut fisheries off Alaska are likely to adversely affect short-tailed albatross, but they are not likely to jeopardize its continued existence (USFWS 2015, 2018). The 2015 biological opinion included an incidental take limit of six short-tailed albatross every two years in the groundfish fisheries off Alaska, either by hook-and-line gear or trawl gear. The 2018 biological opinion included an incidental take limit of two short-tailed albatross every two years in the halibut fisheries off Alaska.

In 2016, NOAA Fisheries Alaska Region formed the Alaska Groundfish and Halibut Seabird Working Group. This working group serves as an advisory body to NOAA Fisheries and the USFWS for the purposes of reducing groundfish and halibut fisheries bycatch of short-tailed albatross and other seabirds (A.M. Eich – pers. com.). This working group will facilitate adaptive management to minimize and avoid take of short-tailed albatross and other seabirds in the Alaska groundfish fisheries, as prescribed by the 2015 and 2018 USFWS biological opinions (USFWS, 2015 & 2018).

In the following table (Table 13), estimated seabird bycatch in the sablefish hook and line fishery is provided for the BSAI and GOA Groundfish FMP areas, 2007 through 2015. (Source: NOAA Technical Memorandum NMFS-F/AKR-12[141]). No short-tailed albatross have been reported in this fishery in recent years.

Table 13. Seabird bycatch in the sablefish hook and line fishery.

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 recent data available. Sperm Whales, Killer whales, and seals may selectively eat hooked groundfish species such as sablefish directly from the longline gear before the line is retrieved by the vessel. In such instances there would be only empty hooks as the line is retrieved over the roller and into the vessel. The Alaska Region coordinates with local, regional, national agencies, organizations, and experts in its efforts to reduce incidental take.

In Alaska, depredation primarily affects the economically significant halibut and sablefish fisheries. Depredation can have negative consequences to whales, fishermen, and the management of the fishery. Whales engaging in depredation have a higher risk of injury due to vessel strikes or entanglement with fishing gear. They can also become habituated to the presence of these food sources, altering their foraging behaviors and increasing their dependence on longline fisheries. Fishermen can be severely impacted by the reduction in a season's catch due to depredation and the near complete loss of individual hauls in the presence of whales. The measures they take to avoid or mitigate for depredation, like increasing set times or moving to different fishing areas, can further increase the costs of operation.

[141] https://repository.library.noaa.gov/view/noaa/12695

Depredation also affects efforts to sustainably manage these high valued fisheries. Without fully quantifying the losses due to depredation or incorporating this factor into measures of catch per unit effort (CPUE, a commonly used measure in fisheries management), the ability of fishery managers to accurately assess the stocks is diminished. While sperm whale depredation occurs primarily in the central and eastern Gulf of Alaska and in southeast Alaska, killer whale depredation is more likely to take place in the western Gulf of Alaska, the Aleutian Islands, and the Bering Sea. Effects of depredation are taken into account in the sablefish stock assessment and management processes.

Bait fisheries

Most longline bait is purchased frozen, and thawed before using. Salmon, herring, cod, and octopus or squid are typically purchased for bait. These bait species are well managed by either the State of Alaska or the NMFS, and none are classified as endangered or threatened.

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

Evidence

Sablefish are not typically categorized as a key prey species for any single marine predator. Several comprehensive studies of the food web 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 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.

The main juvenile sablefish predators are adult coho and chinook salmon, which prey on young-of-the-year sablefish during their pelagic stage. Sperm whales are likely a major predator of adult sablefish. Juvenile sablefish (< 60cm 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. Further details are presented in Clause 12.1 above.

12.8. States shall introduce and enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

Evidence

MARPOL 73/78[142,143](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.

[142] https://www.law.cornell.edu/uscode/text/33/1901
[143] http://www.gao.gov/assets/230/228813.pdf

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. 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. In 2015 NOAA Fisheries and the NPFMC conducted an EFH 5-Year Review[144]. The review[145] examined information within the 2005 EFH Environmental Impact Statement (EIS) and determined:

- New and more recent information and methods exists to refine EFH descriptions and maps for many species.
- Using the best available science and a newly developed Fishing Effects model, changes in management with regard to fishing within EFH is not recommended at this time.
- The non-fishing impacts analysis, including advisory EFH Conservation Recommendations, be updated with the most current level of information, including sections on ocean acidification, climate change, and ecosystem processes.

The current (2015) EFH contains some recommended revisions to the existing EFH text in the GOA and BSAI FMPs, including groundfish.

At present, designations of EFH for sablefish in the current GOA FMP[146] are as follows:

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.

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.

[144] https://alaskafisheries.noaa.gov/habitat/efh-review
[145] https://repository.library.noaa.gov/view/noaa/17257
[146] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

At present, designations of EFH for sablefish in the current BSAI FMP[147] are as follows:
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[148]. 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)[149].

Furthermore, vast areas of the North Pacific have been permanently closed (Figure 2) 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[150]. In total, closures implemented during the last 15 years in large portions of the Bering Sea, combined with previous closures in the AI and GOA, protect approximately 700,000 square n. miles of the BSAI and GOA shelf, slope, ridge, and seamount areas from bottom fishing activities.

NPFMC revised the EFH sections of its Fishery Management Plans (FMPs) to address the results of the 5-year review done in 2015. As of 2018, NPFMC has submitted Amendment 115 to the FMP for Groundfish of the Bering Sea and Aleutian Islands Management Area, Amendment 105 to the FMP for Groundfish of the Gulf of Alaska, Amendment 49 to the FMP for Bering Sea/Aleutian Islands King and Tanner Crabs, Amendment 13 to the FMP for the Salmon Fisheries in the EEZ Off Alaska, and Amendment 2 to the FMP for Fish Resources of the Arctic Management Area, (collectively Amendments) to the Secretary of Commerce for review. If approved, these Amendments would revise the FMPs by updating the description and identification of EFH, and updating information on adverse impacts to EFH based on the best scientific information available. The Secretary of Commerce is expected to make their determination on the EFH Omnibus Amendments in the summer of 2018. More information on the process, including the proposed changes to EFH contained in the FMP Amendments, can be seen in the Federal Register[151].

[147] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[148] https://www.afsc.noaa.gov/REFM/Docs/2016/ecosysEBS.pdf
[149] https://www.afsc.noaa.gov/REFM/Docs/2016/GOAsablefish.pdf
[150] https://www.npfmc.org/habitat-protections/
[151] https://www.federalregister.gov/documents/2018/03/05/2018-04351/fisheries-of-the-exclusive-economic-zone-off-alaska-essential-fish-habitat-amendments

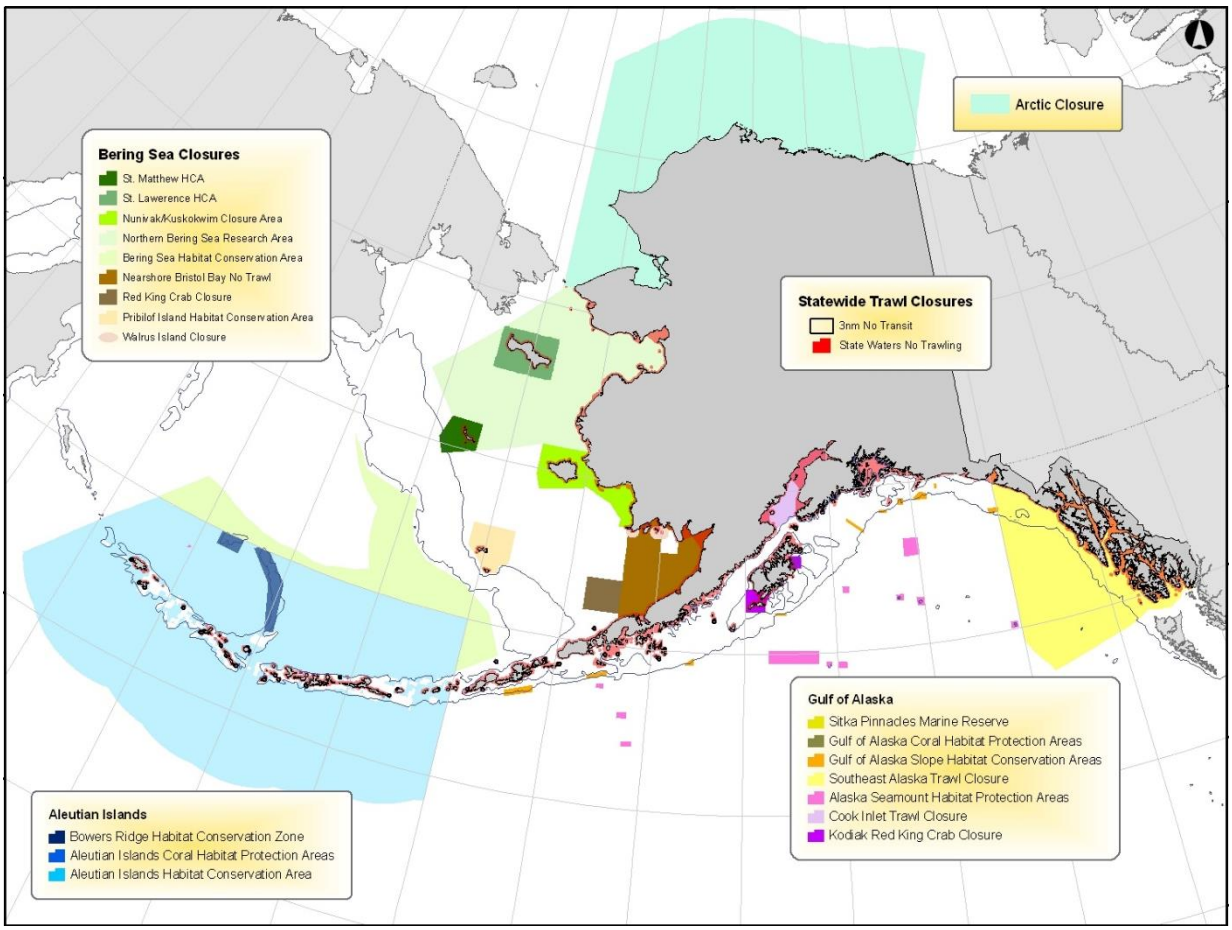

Figure 2. North Pacific fishery closed areas (as at 2017). (Source: https://www.npfmc.org/habitat-protections/).

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[152] produces an annual Economic Status Report of the Groundfish fisheries in Alaska (Fissel et al., 2017).

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:

- 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

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

- 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. NOAA Auke Bay lab has been doing research in collaboration with University of Alaska and ADFG on determining effects of fishing gear on benthic habitats. Theses research individual projects fall into three major categories: 1) effects of specific gear on specific habitat, 2) linkage of fishing induced disturbance to population dynamics of commercial and non-commercial species, 3) mitigation-related studies.

At its June 2018 meeting, NPFMC received a report from the newly formed Social Science Planning team (SSPT)[153], which hosted its first in-person meeting May 8-9, 2018. The purpose of the SSPT is to provide inter-agency support to improve the quality and application of social science data that informs management decision-making and program evaluation, and to strategize medium- and long-term improvements in data collection and analytical methodology.

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. In the 20 years since implementation of the IFQ Program, this was the first formal and comprehensive review of the program[154].

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.
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.

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

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.

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. an 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 includes 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 main bycatches in the sablefish fisheries such as shark, skate and grenadier; where evaluations are possible, all of these species are not overfished nor overfishing is occurring[155].

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

Evidence

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 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 mammal interactions

As previously mentioned, interaction with seabirds and marine mammals are at levels considered to be non-significant, and there are no interactions 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[156]. As noted above, the USFWS has issued Biological Opinions that address the potential effects of the Alaska Sablefish hook-and-line fishery and the BSAI and GOA hook-and-line groundfish fisheries on the endangered short-tailed albatross. The USFWS

[155] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[156] http://www.adfg.alaska.gov/index.cfm?adfg=shorttailedalbatross.management

Biological Opinions state that these fisheries are not likely to jeopardize the continued existence of the short-tailed albatross. Based on available information, there does not seem to be any incidental catch in 2016-17 of short tailed albatross or interactions with Steller sea lions by any of the sablefish fisheries in Alaska.

Most (83%) of the sablefish[157] 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)[158] 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 marine mammals such as sea lions are known to interact with longline gear, bycatch is considered non-significant as shown in the most recent data available.

There are also extensive management measures to protect Steller sea lions in Alaskan waters, as detailed in the NPFMC FMPs[159].

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

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.

[157] https://docs.lib.noaa.gov/noaa_documents/NMFS/TM_NMFS_AFKR/TM_NMFS_FAKR_12.pdf
[158] https://alaskafisheries.noaa.gov/pr
[159] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

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. 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, a total of 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[160].

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 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[161].

12.14. There shall be outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.

Evidence

Alaska Sablefish are not typically categorized as a key prey species for any single marine predator (see full text in Predators/Competitors section in Clause 12.1, from Hanselman et al., 2017). As such, this clause is NOT APPLICABLE.

[160] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[161] https://www.npfmc.org/habitat-protections/

12.15. There shall be outcome indicator(s) consistent with achieving 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. Any modifications to the habitat for enhancing the stock under consideration must be reversible and not cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

Evidence

The NPFMC approach to groundfish fisheries explicitly includes ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. This includes the setting of outcome indicators related to preserving the food web, managing incidental catch, avoiding impacts on seabirds and mammals and reduce and avoid impacts to habitats.

There is no evidence to suggest that either Alaska sablefish, or species with similar biological characteristics, have benefitted from the use of artificial structures. The use of artificial structures is neither practical nor appropriate for Alaska Sablefish. There is no use of artificial structures for the benefit of the north Eastern Alaska Sablefish stock; as such that portion of the Clause is not applicable.

9. Performance specific to agreed corrective action plans

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

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

Not applicable, full conformance was demonstrated.

11. Future Surveillance Actions

Not applicable, next assessment will be a surveillance assessment in 2019.

12. Client signed acceptance of the action plan

Not applicable, full conformance was demonstrated.

13. Recommendation and Determination

Following this 2nd surveillance assessment, finalized in July 2018, 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).

14. 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 (2018) North Pacific Observer Program 2017 Annual Report. AFSC Processed Rep. 2018-02, 136 p.	https://alaskafisheries.noaa.gov/sites/default/files/2017annualreport.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, J. M. 2013. North Pacific marine mammal bycatch estimation methodology and results, 2007-2011. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-260, 40 p.	
Cahalan, J., J. Gasper, and J. Mondragon. 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska, 2015 edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-286, 46 p.	https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-286.pdf
Coutré, K. M., A.H. Beaudreau, and P.W. Malecha. 2015. Temporal Variation in Diet Composition and Use of Pulsed Resource Subsidies by Juvenile Sablefish. Transactions of the American Fisheries Society, 144(4), 807-819.	
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. 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
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
Fishing vessel participation	https://www.npfmc.org/wp-content/PDFdocuments/halibut/IFQProgramReview_417.pdf
Fissel, B., M. Dalton, B. Garber-Yonts, A. Haynie, S. Kasperski, J. Lee, D. Lew, A. Lavoie, C. Seung, K. Sparks, S. Wise. 2017.	https://www.afsc.noaa.gov/REFM/Docs/2017/economic.pdf

Reference	Hyperlink
Economic status of the groundfish fisheries off Alaska, 2016. In Stock assessment and fishery evaluation report for the groundfish resources of the GOA and BS/AI. North Pacific Fishery Management Council, 605 W 4th Ave, Suite 306 Anchorage, AK 99501. 425 p.	
Dournier, D. and, C.P. Archibald. 1982. A General Theory for Analyzing Catch at Age Data. Canadian Journal of Fisheries and Aquatic Sciences, 1982, 39(8): 1195-1207	https://doi.org/10.1139/f82-157
Gauvin. J. 2013. Final Report on EFP 12-01: Halibut deck sorting experiment to reduce halibut mortality on Amendment 80 Catcher Processors. Alaska Seafood Cooperative Report.	
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
Goen, J., T. Geernaert, E. Henry, E. Soderlund, A.M. Ranta, T.M. Kong, and J. Forsberg. 2017. Fishery-independent setline survey (FISS) design and implementation in 2017, including current and future expansions. IPHC-2018-AM094-06 Rev1.	https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-06.pdf
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.	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; Alaska Sablefish Assessment for 2006.	https://www.researchgate.net/publication/265271817_3_Alaska_Sablefish_Assessment_for_2008
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, 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, 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.	
Hanselman, D.H., C. Lunsford, and C. Rodgveller. 2014. 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)	
Hanselman, D.H., C.J. Rodgveller, C.R. Lunsford, and K.H. Fenske. 2017. Assessment of the sablefish stock in Alaska. Stock Assessment and Fishery Evaluation Reports for the	https://www.afsc.noaa.gov/REFM/stocks/assessments.htm

Reference	Hyperlink
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. 327-502 (GOA report), pp. 563-738 (BSAI report)	
Heifetz, J. and J. T. Fujioka. 1991. Movement dynamics of tagged sablefish in the northeastern Pacific Ocean. Fish. Res., 11: 355-374.	
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
AWT. 2015. Marine Enforcement Section webpage. 5700 E Tudor Road, Anchorage, AK 99507	http://dps.alaska.gov/awt/Marine.aspx
Kawakami, T. 1980. A review of sperm whale food. Sci. Rep. Whales Res. Inst. 32: 199-218.	
Kimura, D. K. 1990. Approaches to age-structured separable sequential population analysis. Can. J. Fish. Aquat. Sci. 47: 2364-2374.	
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, 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.	
Lew, D. K., G. Sampson, A. Himes-Cornell, J. Lee, and B. GarberYonts. 2015. Costs, earnings, and employment in the Alaska saltwater sport fishing charter sector, 2011- 2013. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-299, 134 p.	
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, 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 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, G.A. and Beamish, R.J. 1992. Climatic influences	

Reference	Hyperlink
linking copepod production with strong year classes in sablefish (*Anoolopoma fimbria*). Can. J. Fish. Aquat. Sci. 49: 743-753.	
Melvin, E.F. 2000. Streamer Lines to Reduce Seabird Bycatch Reduce Seabird Bycatch in Longline Fisheries in Longline Fisheries. Washington Sea Grant Program, University of Washington.	
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, 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
NOAA Marine Debris Program. 2015. Report on the impacts of "ghost fishing" via derelict fishing gear. Silver Spring, MD. 25 pp.	https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.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
Sadorus, L. L. and Walker, J. 2017. IPHC Oceanographic monitoring program 2017. IPHC Report of Assessment and Research Activities 2017, p. 95-103.	https://iphc.int/uploads/pdf/am/2018am/iphc-2017-rara27-r.pdf
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 https://www.afsc.noaa.gov/REFM/Docs/2016/GOAshark.pdf
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
Echave et al., 2015. Assessment of the Thornyhead stock	https://www.afsc.noaa.gov/REFM/Docs/2015/GOAthorn

Reference	Hyperlink
complex in the Gulf of Alaska;	y.pdf
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, 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.	
Sigler, M. F. and C. R. Lunsford. 2001. Effects of individual quotas on catching efficiency and spawning potential in the Alaska sablefish fishery. Can. J. Fish. Aquat. Sci. 58: 1300-1312.	
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, 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, 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 Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training and Education Center	http://www.avtec.edu/
The University of Alaska Sea Grant Marine Advisory Program (MAP	http://seagrant.uaf.edu/map/fisheries/
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
USFWS, 2015. Biological Opinion for the Effects of the Fishery Management Plans for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Fisheries and the State of Alaska Parallel Groundfish Fisheries, December 2015. 49 pp.	https://alaskafisheries.noaa.gov/sites/default/files/analyses/usfws-biop-122315.pdf.
USFWS. 2018. Biological Opinion For the Effects of the Pacific Halibut Fisheries in Waters off Alaska on the Endangered Short-tailed Albatross (*Phoebastria albatrus*). Anchorage, AK: 50 pp.	
Wing, 1985	

Reference	Hyperlink
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.	www.afsc.noaa.gov/nmml/PDF/sars/ak2002sest-w.pdf
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, 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

15. Appendices

15.1. Appendix 1 – Assessment Team Details

Assessment Team Details

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.

William (Bill) Brodie – Assessor

Bill Brodie is an independent fisheries consultant with previously, a 36-year career with Science Branch of Fisheries and Oceans Canada (DFO, Newfoundland and Labrador Region). He has a B.Sc. in Biology from Memorial University of Newfoundland and Labrador. For the last 12 years with DFO he worked as Senior Science Coordinator/Advisor on Northwest Atlantic Fisheries Organization (NAFO) issues, serving as chair of the Scientific Council of NAFO and chairing 3 of its standing committees. As a stock assessment biologist, he led assessments and surveys for several flatfish species and stocks, including American plaice, Greenland halibut, and yellowtail and witch flounders. These include the largest stocks of flatfish in the NW Atlantic. He also participated in assessments of flatfish, gadoid, and shrimp stocks in the NE Atlantic and North Sea. Bill has participated in over 30 scientific research vessel surveys on various Canadian and international ships, and has published extensively in the scientific and technical literature, primarily on flatfish stock assessment. He participated with fishery managers and the fishing industry in a variety of issues, including identification of ecologically sensitive areas, and developing rebuilding plans for groundfish under a Precautionary Approach. Since retirement from DFO in 2014, Bill has been contracted to serve as an assessor on several FAO-based Responsible Fisheries Management certification assessment and surveillance audits for Alaskan stocks including Pacific cod, halibut, sablefish, pollock, and flatfish. He has also provided peer review for MSC certification assessments for stocks in the Icelandic and Grand Banks areas.