FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION
SECOND SURVEILLANCE REPORT

For The

Alaska Sablefish Commercial fishery

Applicant Group

Alaska Seafood Marketing Institute

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I. Summary and Recommendations

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

This report is the Second Surveillance Report (ref: AK/SAB/001.2/2013) for the Alaska sablefish federal and state commercial fisheries following Certification award against the FAO-Based RFM Program, awarded on October 11th 2011. The objective of the Surveillance Report is to monitor for any changes/updates (after 12 months) in the management regime, regulations and their implementation since the previous assessment; in this case the first Surveillance Report completed in November 2012. The Report determines whether these changes and current practices remain consistent with the overall scorings of the fishery allocated during initial certification.

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

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

The surveillance assessment was conducted according to the Global Trust Certification ISO 65 accredited procedures for FAO – Based Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria V1.2 fundamental clauses as the assessment framework.

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

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

II. Assessment Team Details

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1. Introduction

Unit of Certification

The sablefish (black-cod) commercial (federal and state) fisheries, employing demersal longline, pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management underwent their 2nd surveillance assessment against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2 Fundamental clauses.

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

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

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

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

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

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

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

1.1. Recommendation of the Assessment Team

Following this Second Surveillance Report in 2013 the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the sablefish (black cod) commercial federal and state fisheries, employing demersal longline, pot and trawl gear within Alaska jurisdiction (200 nautical miles EEZ) under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

2. Fishery Applicant Details

Applicant Contact Information			
Organization/ Company Name:	**Alaska Seafood Marketing Institute**	Date:	**April 2010**
Correspondence Address:	**International Marketing Office and Administration Suite 200**		
Street :	**311 N. Franklin Street**		
City :	**Juneau**		
State:	**Alaska AK 99801-1147**		
Country:	***USA***		
Phone:	**(907) 465-5560**	**E-mail Address:**	***info@alaskaseafood.org***
Key Management Contact Information			
Full Name:	*(Last)* **Rice**	*(First)* **Randy**	
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Nominated Deputy:	***As Above***		
Deputy Phone:	**As Above**	**Deputy E-mail Address:**	**rrice@alaskaseafood.org**

3. Unit of Certification

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

4. Surveillance Meetings

Organization	Time, day and representative	Items discussed
Alaska Seafood Marketing Institute, Seattle, USA.	09th September 2013, 09.00 am. Randy Rice, Seafood Technical Program Director	• Sablefish assessment, technical aspects and timelines for assessment completion.
Alaska Fisheries Science Center, Seattle, USA.	10th September 2013, all day. Joint Groundfish Plan Teams for the BSAI and GOA.	• 2013 Prohibited species closures, • Preliminary 2013 groundfish in the halibut target, • Observer Deployment, Plan, Letter to NPFMC, • Spatial management workshop, • Highlights of revised NS2 guidelines, • ACL II Discussion paper, Council, SSC, ANPR, • EFH Description Refinements and the

		Fishing Effects Model.
Alaska Fisheries Science Center, Seattle, USA.	11th September 2013, all day. Joint Groundfish Plan Teams for the BSAI and GOA.	• Working group report reviews on 1) Retrospective analysis, 2) Stock recruitment and 3) Survey averaging/Area apportionment, • Total current year removals, • Value of surveys, • Ecosystem Chapter Update, • Sablefish update, • GOAIERP report, • Research Priorities.
Alaska Fisheries Science Center, Seattle, USA.	12th September 2013, all day. Joint Groundfish Plan Teams for the BSAI and GOA.	• GOA bottom trawl survey report, • GOA Summer and Shelikof Strait winter survey report.
Pacific Seafood Processor Association, Seattle, USA.	13th September 2013, 03.00 pm. Glenn Reed,	• Updates in regulations, • 2013 sablefish stock status, • Interaction/depredation by whales in survey and commercial longline catches, • Work towards minimization of catch loss to whale depredation.

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

5. Assessment Outcome Summary

Fundamental Clauses Summaries

Clause 1: Structured and legally mandated management system
Evidence adequacy rating: High
The U.S. Alaska sablefish commercial fishery is managed by the North Pacific Fishery Management Council (NPFMC) and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, the Alaskan 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.

Clause 2: Coastal area management frameworks
Evidence adequacy rating: High
The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. These include decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. With regards to conflict avoidance and resolution between different fisheries, the North Pacific Fishery Management Council (NPFMC) and the Board of Fisheries (BOF) tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance of potential fisheries conflicts.

Clause 3: Management objectives and plan
Evidence adequacy rating: High
The Magnuson Stevens Fishery Conservation and Management Act (Magnuson Stevens Act, MSA) is the primary domestic legislation governing management of the nation's marine fisheries. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the sablefish fisheries in those regions. Both FMPs present long-term management objectives for the Alaska sablefish fishery. In state waters (0-3 nm), five Alaska sablefish fisheries are managed by ADFG and the BOF outside the IFQ program using a Guideline Harvest Level (GHL). The Aleutian Islands District and Western District of the South Alaska Peninsula Area Sablefish Management Plan (5 AAC 28.640) governs the harvest of sablefish in the Area as described in 5 AAC 28.555(b). 5 AAC

28.360 defines the Cook Inlet Sablefish Management Plan. Sablefish harvest, possession, and landing requirements for Prince William Sound Area are governed under 5 AAC 28.272. Southeast Alaska State managed sablefish (Chatham and Clarence strait) regulations are specified under 5 AAC 28.160 in the Groundfish Commercial Fisheries Regulations. These regulations document long term management objectives for these fisheries.

Clause 4: Fishery data
Evidence adequacy rating: High

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

Clause 5: Stock assessment
Evidence adequacy rating: High

The mission of the NMFS/AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The updated point estimates of B40%, F40%, and F35% from this assessment are 106,506 t (combined across the EBS, AI, and GOA), 0.095, and 0.113, respectively. Projected female spawning biomass (combined areas) for 2013 is 97,193 t (91% of B40%), placing sablefish in sub-Tier "b" of Tier 3. Apart from new data, there are no model changes in 2012 relative to 2011. ADFG annual longline research surveys began in 1988 in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Mark-recapture studies for sablefish are also carried out in NSEI. The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The Aleutian Island fishery is set as 5% of the BSAI federal TAC. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Ecosystem considerations for this fishery are reported in the sablefish SAFE report.

Clause 6: Biological reference points and harvest control rule
Evidence adequacy rating: High

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The Tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each

stock in the complex (usually individual species but sometimes species groups). The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. The limit reference point is ½ MSY or $B_{17.5\%}$. The probability that next year's spawning biomass was below B35% was 0.17. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.7 (up from 0.6 last year), and the probability of staying below B40% is near 100%. In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA.

The harvest control rule applied to sablefish is recognized as being effective at maintaining the stock at a biomass capable of producing maximum sustainable yield. When stock size falls below a target, the harvest rate is reduced to promote rebuilding to the target. The current biomass of sablefish is estimated to be below the B40% target, and consequently the TAC for the next year will be determined by the rule in Tier 3b, e.g. the harvest rate will be below the maximum allowed.

Clause 7: Precautionary approach
Evidence adequacy rating: High

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

Clause 8: Technical management measures
Evidence adequacy rating: High

The federal sablefish fishery is managed under an Individual Quota System (IFQ). Under the major State managed sablefish fisheries, the use of an equal quota share system is very much like individual fishery quotas, and produces the same efficiencies. The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify Annual Catch Limits (ACLs) with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)) and to subsequently account for whatever catches, bycatch

or discards previously unaccounted. The Federal FMP for the BSAI and GOA list the fishery closures that are in place throughout Alaska. These closures apply to different vessels and gear types. The NMFS and the ADFG have well-established regulations on fishing seasons and legal gear use. Longline, trawl and pot gear are all regulated to increase selectivity of the target species and to avoid bycatch and discards. In addition to this, management measures and operational methods (i.e. MRB, PSC) are in place to account for bycatch and discards of encountered bycatch species.

Clause 9: Management measures to produce maximum sustainable levels
Evidence adequacy rating: High

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Projected 2013 spawning biomass of sablefish is 37% of the unfished spawning biomass. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC≤ABC<OFL. The harvest control rule is designed to ensure the population is capable of producing MSY in the long term.

Clause 10: Appropriate standards of competence
Evidence adequacy rating: High

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

Clause 11: Effective legal and administrative framework
Evidence adequacy rating: High

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

Clause 12: Framework for sanctions
Evidence adequacy rating: High

The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations: ***1)*** *Issuance of a citation (a type of warning), usually at the scene of the*

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

Clause 13: Impacts of the fishery on the ecosystem
Evidence adequacy rating: High

The NPFMC and NMFS conduct assessments and research related to fishery impacts ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document, annual Ecosystem Considerations documents, and the various other research reports. The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that the benthic longline and pot fisheries have minimal or temporary impacts on sablefish habitat. Various studies have applied ecosystem models to food webs and impacts of climate change. Sablefish have low discard rates in other fisheries. The directed sablefish fishery takes significant amounts of grenadiers, arrowtooth flounder, spiny dogfish, sharks and some rockfish; but the fishery does not pose a threat to bycatch species. Management measures limit interactions with seabirds and the fishery has minimal impact on the short-tailed albatross, the only seabird listed as endangered under the ESA. Interactions with whales remain a problem as they take fish off longline gear, but the fishery does not adversely affect whale populations. The 2012 sablefish assessment presents research recommendations including those to better understand environmental variables on recruitment processes.

6. Conformity Statement

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

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

A. The Fisheries Management System

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

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

FAO Eco 28

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

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 Alaskan sablefish fishery is managed through the NPFMC's GOA and BSAI Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The FMPs established an Individual Fishing Quota (IFQ) management program for this fishery. State sablefish fisheries are managed outside the IFQ program using a Guideline Harvest Level (GHL).The US Coast Guard and the Alaska Wildlife Troopers enforce fisheries regulations in federal and state waters respectively.

The NPFMC recommends regulations to govern the directed sablefish fisheries and makes allocation decisions among sablefish users and user groups in federal waters off Alaska. NPFMC sablefish management measures include a Total Allowable Catch (TAC) which is divided among gear types (trawl and fixed gear) and an Individual Fishing Quota (IFQ) program is used for the majority of the TAC taken by the fixed gear fleet. Fixed gear (mainly longlines, but also pots) harvests around 85% of the sablefish quota and trawl gear about 15%. The NMFS conducts stock surveys, stock assessment reports and a multitude of biological and environmental studies, and in connection with the United States Coast Guard (USCG) enforces fisheries regulations. NOAA's Alaska Fisheries Science Center (AFSC) annually assesses the abundance of sablefish through longline surveys. The groundfish trawl survey is also used to gauge sablefish abundance. Fishery dependent data also collected by on-board fishery observers and through required and voluntary logbook programs. The NMFS has been tagging and releasing sablefish in Alaska waters since 1972 to study movements, evaluate apportionment for quota, validate aging methods and examine growth. In 1995, NPFMC and the NMFS implemented an IFQ system for the Alaska sablefish and halibut fisheries. These agencies, and all of their activities and decisions, are subject to the Magnuson Stevens Act (MSA) which is the primary domestic legislation governing management of the United States marine fisheries and requires the creation of FMPs.

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

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

Evidence:
North Pacific Fishery Management Council
http://www.fakr.noaa.gov/npfmc/

Alaska Department of Fish and Game (ADFG)
http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management
http://www.adfg.alaska.gov/FedAidPDFs/FDS13-29.pdf

ECHAVE, K. B., D. H. HANSELMAN, and N. E. MALONEY. 2013. Alaska Sablefish Tag Program, 1972 - 2012. AFSC Quarterly Report Feature (April-May-June 2013) 15 p. (.pdf, 856 KB).

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

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

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

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

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

NEPA and ACMP

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

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

Alaska Coastal Management Program

The Alaska Coastal Management Question, or Ballot Measure 2, was on the August 28, 2012 in the state of Alaska as an indirect initiated state statute, where it was defeated (76,440 votes to 46,678 votes). The measure would have established a new coastal management program in the state; prior coastal management program expired on July 1, 2011, after the legislature adjourned the second of two special sessions without passing legislation required to extend the program. The failure of this ballot measure leaves Alaska as the only coastal state in the U.S. without a coastal management program. As of February 1, 2013 the Alaskan legislature has not reintroduced any bill regarding the ACMP.

http://www.alaskacoastalmanagement.org/ACMP_Election_Results_8-29-12.pdf

DEC

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

ADFG

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

DNR

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

USFWS

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

ANILCA

The Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and

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

BOEM

The Bureau of Ocean Energy Management (BOEM) (previously Minerals and Management) is responsible for managing environmentally and economically responsible development and provide safety and oversight of the offshore oil and gas leases. The activities of BOEM and the process for application and approval of oil exploration permits overlaps extensively with evaluations by ADNR, ADFG and ADEC given the potential impacts of such activities on anadromous and other marine resources and their habitat. An example of this is provided by the *Cook Inlet Offshore Oil & Gas Exploration Permit Application & Approval Process* available at:
http://dog.dnr.alaska.gov/Permitting/Documents/Arcadis/Arcadis_Flowchart_CookInletOffshore_Draft.pdf
http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf

OPMP

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

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

Conflict Avoidance in the fisheries sector

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

In 2005, the AFSC compiled baseline socioeconomic information about Alaskan fishing communities

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

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

http://www.fakr.noaa.gov/habitat/default.htm
http://www.adfg.alaska.gov/index.cfm?adfg=habitatregulations.main
http://dec.alaska.gov/water
http://alaskafisheries.noaa.gov/ram/
http://dnr.alaska.gov/commis/opmp/anilca/
http://dnr.alaska.gov/commis/opmp/

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

FAO CCRF 7.3.3/7.2.2

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The Magnuson Stevens Fishery Conservation and Management Act (Magnuson Stevens Act, MSA) is the primary domestic legislation governing management of the nation's marine fisheries. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the sablefish fisheries in those regions. Both FMPs present long-term management objectives for the Alaska sablefish fishery. In state waters (0-3 nm), five Alaska sablefish fisheries are managed by ADFG and the BOF outside the IFQ program using a Guideline Harvest Level (GHL). The Aleutian Islands District and Western District of the South Alaska Peninsula Area Sablefish Management Plan (5 AAC 28.640) governs the harvest of sablefish in the Area as described in 5 AAC 28.555(b). 5 AAC 28.360 defines the Cook Inlet Sablefish Management Plan. Sablefish harvest, possession, and landing requirements for Prince William Sound Area are governed under 5 AAC 28.272. Southeast Alaska State managed sablefish (Chatham and Clarence strait) regulations are specified under 5 AAC 28.160 in the Groundfish Commercial Fisheries Regulations. These regulations document long term management objectives for these fisheries.

GOA and BSAI FMPs objectives

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

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

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

Fishery Management Plan for the Groundfish of the BSAI 2012:

http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.pdf

Fishery Management Plan for the Groundfish of the GOA 2012:
http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.pdf

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

State waters

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

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

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

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

Recent changes in sablefish fishery state waters management rules:

The Southeast Alaska northern and southern inside sablefish fishery witnessed a few rule changes implemented by the Board of fisheries in 2012. These included:

1) The department is no longer required to randomly select from interested permit holders when authorizing the take of sablefish outside of established seasons.
2) Subsistence and personal use permit is required for the harvest of subsistence/personal use sablefish.
3) Subsistence-caught groundfish must be offloaded from a vessel before longline gear is operated from that vessel for the commercial harvest of groundfish, and vice versa.
4) Regulations regarding the operation of longline gear in the NSEI and SSEI areas during the 72-hour period before fishing season opens and 24-hour period after the fishing season closes were clarified.

http://www.adfg.alaska.gov/FedAidPDFs/FMR13-08.pdf

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

The NPFMC is currently considering a discussion paper presented at the June, 2013 meeting on the use of pots to fish the GOA sablefish IFQ. The main issues involved in this paper are the potential conservation benefits to marine mammals and sablefish for taking the action and pot gear issues: grounds preemption and gear configurations/storage/soak times. Summary of Council actions to date: *The Council may choose to identify next steps for this proposal at this meeting or it may appoint and convene a gear committee to better inform the Council on the issues it identified as relevant to the proposal in its motion. To initiate an analysis, the Council's first step is to adopt a statement of purpose and need for the action (problem statement) and alternatives for analysis.*

A summary of the proposal: *It is unlikely that additional quantitative data can be developed on current rates and areas of whale depredation on sablefish longline gear for a future analysis to determine the potential effects on whales or sablefish IFQ fishermen of taking no action to allow fishermen to use gear to minimize likelihood of whale interactions in this fishery. The issue is mostly policy driven, i.e., are the issues of gear conflict that necessitated the prohibition on the use of pot gear for sablefish in the GOA sufficient to warrant a change in legal gear usage to minimize whale interactions with the gear to benefit whales, sablefish, and sablefish IFQ fishermen. The Council noted that it may appoint a committee to provide the Council with an understanding of current stakeholder views on this formerly contentious issue, as well as expand on the discussion of the comprehensive list of issues that the Council asked to be addressed in this paper. To streamline a potential analysis, the Council (or its committee) may wish to eliminate topics of inquiry that may not be enforceable (e.g., depth contour) or whose relationship to the proposed action are not clearly articulated (or provide additional rationale for how they may affect the proposed action) (e.g., QS process, crew employment).*
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/D1bSupplemental.pdf

Also, in April 2013, the Council moved the following modified problem statement and Alternative 2, Option 1 as its preferred alternative.
Responsive to National Standard 8, the North Pacific Fishery Management Council established the Community Quota Entity (CQE) program to encourage sustained participation in the Halibut and Sablefish Quota Share Program by residents of smaller Gulf of Alaska fishery dependent communities. CQEs were prohibited from purchasing smaller "sweep up" blocks of quota shares because of concerns that CQE quota purchases could negatively impact quota share price and availability. Concerns about CQE purchase and market impacts on price and availability have not been realized and participation by CQEs in the marketplace has been limited.
The purpose of lifting block restriction for "B" and "C" class quota is to incrementally allow more CQE access to QS and thereby facilitate for the sustained participation by CQE community residents in the Halibut and Sablefish IFQ Program. The need for this amendment is to further address the problem of continued decline in the number of halibut and sablefish IFQ holders in small GOA fishery dependent coastal communities and to incrementally provide for better access for these fishermen through their local CQE to halibut and sablefish resources.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/rural_outreach/CQEsmallBlockRestrictmotio

n413.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/rural_outreach/CQESmallBlock413.pdf

Furthermore, in March of 2013 a discussion paper on the use of Bering Sea sablefish total allowable catch in IFQ and non-IFQ fisheries was presented to the Council. The Council initiated this discussion paper to identify issues associated with separating the Bering Sea (BS) sablefish total allowable catch (TAC) into a fixed gear apportionment and a trawl gear apportionment when recommending annual harvest specifications. The Bering Sea/Aleutian Islands (BSAI) Groundfish Fishery Management Plan (FMP) sets the BS sablefish TAC apportionments to the fixed gear sector and trawl sector at 50 percent of the BS sablefish TAC to each gear type. The Council typically sets the sablefish TACs equal to the acceptable biological catch (ABC) in an effort to maximize the individual fishing quota (IFQ)/community development quota (CDQ) allocations to sablefish quota share holders. The sablefish TACs subsequently are apportioned to the IFQ/ CDQ fixed gear fisheries and the BS sablefish trawl fisheries under the authority of the FMP and Federal regulations. As a result the BS sablefish trawl TAC is set at the maximum level even though harvest is well below its allocation each year.
Approach #1, which uses the non-specified reserve, could be adopted as part of the 2014/2015 harvest specification cycle to recapture some foregone OY if some of the non-specified reserve is reallocated to either sablefish fixed gear sector (some recaptured OY) and/or any or multiple TACs of other groundfish TAC categories (more recaptured OY). The Council would recommend each year to which TAC category it would reassign some of the non-specified reserve.
Approach #2 would require a BSAI Groundfish FMP amendment and regulatory amendment in order to authorize the Council to reapportion unused sablefish TAC which is apportioned to the trawl sector 1) directly to the sablefish fixed gear sector or (to result in some recaptured OY) and/or 2) any or multiple TACs of other groundfish TAC categories (to result in more recaptured OY). The Council would decide each year to which TAC category it would reassign some of the unused sablefish trawl apportionment. For the reapportionment to occur, a BS sablefish fixed gear TAC and BSA sablefish trawl gear TAC would be required in order to reapportion (only) unused trawl TAC.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/SPECS/BSsablefishTAC_dp413.pdf

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

(1) conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock;
(2) minimization of bycatch of other associated fish and shellfish and prevention of the localized depletion of stocks;
(3) protection of the habitat and other associated fish and shellfish species from non sustainable fishing practices;
(4) maintenance of slower harvest rates by methods and means and time and area restrictions to ensure the adequate reporting and analysis necessary for management of the fishery;
(5) extension of the length of fishing seasons by methods and means and time and area restrictions

to provide for the maximum benefit to the state and to regions and local areas of the state;
(6) harvest of the resource in a manner that emphasizes the quality and value of the fishery product;
(7) use of the best available information presented to the board; and
(8) cooperation with the North Pacific Fisheries Management Council (NPFMC) and other federal agencies associated with groundfish fisheries management.

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

B. Science and Stock Assessment Activities

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

FAO CCRF 7.1.9/7.4.4/7.4.5/7.4.6/8.4.3/12.4
ECO 29.1-29.3

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating Determination

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

Table 4.1. Summary of data sources, types and years available for the sablefish fishery.

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

		2011

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

New data used in the 2012 stock assessment model included relative abundance and length data from the 2012 longline survey, relative abundance and length data from the 2011 longline and trawl fisheries, age data from the 2011 longline survey and 2011 fixed gear fishery, updated 2011 catch and projected 2012 catch.

Fishery independent data

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

Longline surveys

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

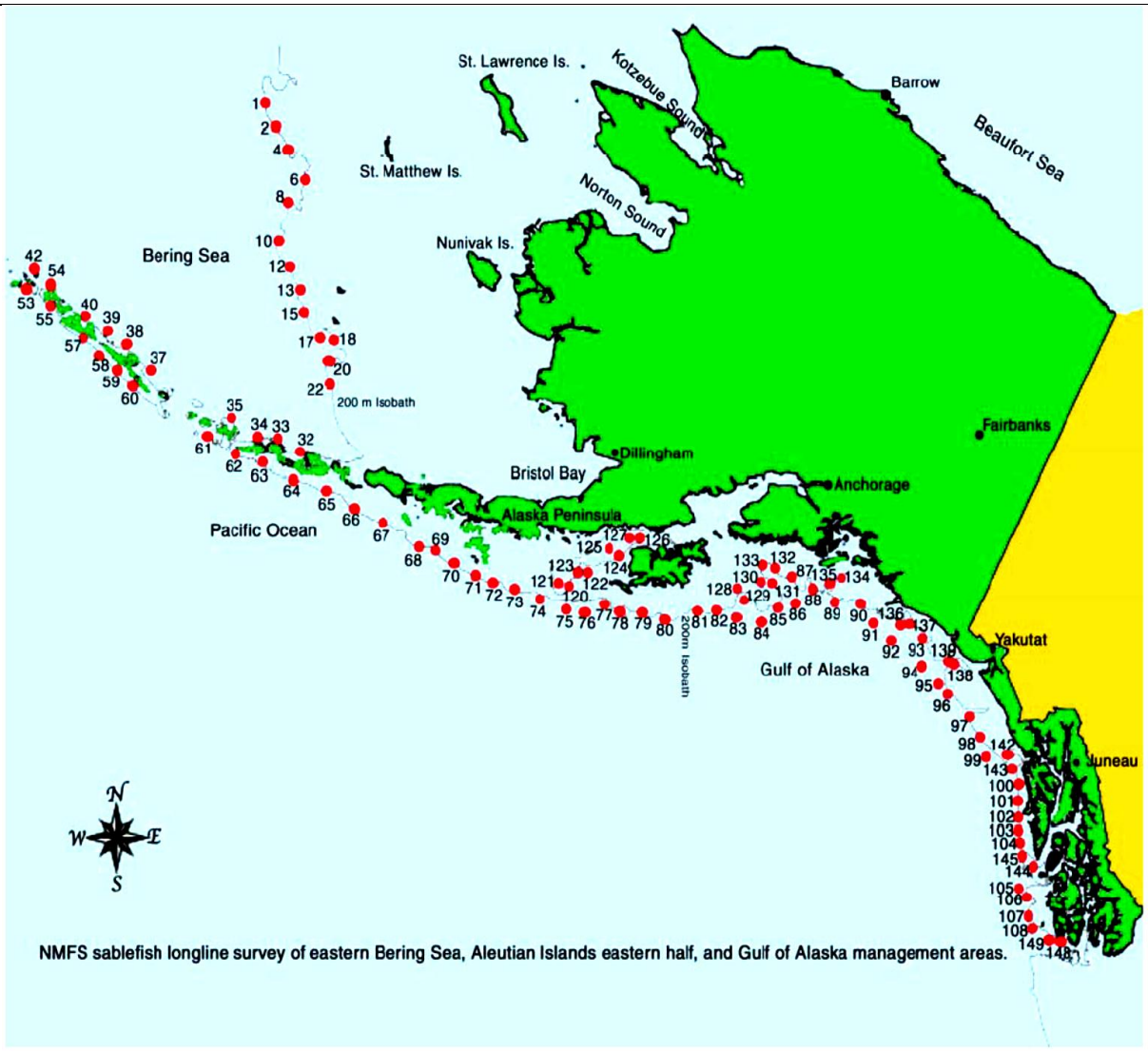


Figure 4.1. NMFS Survey area for Alaska sablefish longline survey.

Survey objectives

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

Survey description

The survey covers the upper continental slope and selected gullies of the eastern Bering Sea, Aleutians Islands region, and Gulf of Alaska. The survey covers nearly all areas where adult sablefish are found. Depths sampled during the survey of the upper continental slope range from about 150-1,000 m. Sampling occurs during the summer and lasts three months. The fixed station positions are divided among six NPFMC management areas: Bering Sea, Aleutian Islands, Western GOA, Central GOA, West Yakutat, and East Yakutat/Southeast. Stations are placed 30-50 km apart, and gear is set from 150-1000 m at each slope station. Catches are pooled by management area and an abundance index is computed for use in stock assessment and fishery evaluation reports. Scientists have been

developing methods to adjust longline samples for whale depredation, but such corrections have not been applied yet in stock assessment models.
(NOAA / AFSC. Survey protocol for the Alaska sablefish longline survey).

Trawl surveys

NMFS has conducted trawl surveys of the upper continental slope that adult sablefish inhabit biennially or triennially since 1980 in the Aleutian Islands, and since 1984 in the GOA. Trawl surveys of the Eastern Bering Sea slope were conducted biennially from 1979-1991 and standardized for 2002, 2004, and 2008. Trawl surveys of the Eastern Bering Sea shelf are conducted annually.
Trawl surveys divide the Gulf of Alaska into 54 strata categorized by depth interval, type of geographical area (e.g., banks, gullies, and slopes) and International North Pacific Fisheries Commission (INPFC) statistical areas. Depth intervals were defined as less than 100, 101-200, 201-300, 301-500, 501-700 and 700 – 1,000 m. After the number of stations was allocated to each stratum, station grid cells are chosen randomly from a 5 x 5 km grid laid over the survey area. The target tow duration is 15 minutes; minimal acceptable tow duration was 10 minutes. Attempts were made to maintain constant bottom depth, trawl wingspread, and towing speed (3 knots) during each tow.

Tagging studies

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

NMFS/Auke Bay Lab (ABL) has deployed traditional anchor tags on over 360,000 sablefish, recovering more than 33,500. Beginning in 2003, electronic archival tags were deployed inside approximately 1,460 juvenile and adult sablefish and 141 of those have been recovered. Upon release and recapture of the archival tagged fish, geo-position, depth, and biological data may be collected. Beginning in 2011, exploratory work using pop-off satellite tags on sablefish was initiated. These tags are similar to archival tags in that they collect depth and temperature data at pre-determined sampling intervals, but they also record an estimated location. Satellite tags release from the fish at a pre-programmed date and float to the surface where they upload recorded data to passing satellites. Although not used in federal stock assessment models, tagging studies offer an independent check on the population and migration. In state waters, ADFG also tags sablefish as part of mark-recapture studies in NSEI.

State waters sablefish fishery independent data

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

A general linear multivariate model has been used to detect significant CPUE trends over time. Biological data collected during the surveys include length, weight, sex, stage of maturity and otoliths. This data is used to describe the age and size structure of the populations and detect recruitment events. ADFG standardized its survey methods with NMFS survey. In 2000 the department constructed and purchased survey gear to ensure standardization between survey vessels. Mark-recapture studies for sablefish are also carried out in Southeast Alaska NSEI; but not in SSEI due to likely migration of stocks. ADFG performs annual longline surveys (CPUE, relative abundance, and biological data) in Chatham and Clarence Strait and pot fishery surveys in Clarence Strait. In addition, ADFG is conducting pilot studies to determine the feasibility of an acoustic tagging of sablefish in Chatham Strait.

ADFG conducted a sablefish tagging event in the NSEI Subdistrict using the ADFG vessel, R/V Medeia, from May 21–June 14, 2013. Sablefish were captured using pot gear, tagged, and released. Tagged fish will be recovered in the 2013 ADFG longline survey, commercial, subsistence, personal use, and recreational fisheries. The resultant data will be used to calculate a biomass estimate and set the 2014 NSEI Subdistrict commercial sablefish AHO. The 2013 ADFG longline survey took place July 28–August 3, 2013. Data from the 2013 longline survey will be used to obtain current size, age, and sexual maturity information for the 2014 stock assessment.

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

Fishery dependent data

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

Table 4.2. Alaska sablefish catch (t). The values include landed catch and discard estimates. Discards were estimated for U.S. fisheries before 1993 by multiplying reported catch by 2.9% for fixed gear and 26.9% for trawl gear (1994-1997 averages) because discard estimates were unavailable. Eastern includes West Yakutat and East Yakutat / Southeast. 2012 catch as of September 29, 2012 http://www.afsc.noaa.gov/REFM/Docs/2012/GOAsablefish.pdf

		BY AREA								BY GEAR	
Year	Grand total	Bering Sea	Aleu-tians	Western	Central	Eastern	West Yakutat	East Yak/SEO	Un-known	Fixed	Trawl
1960	3,054	1,861	0	0	0	1,193			0	3,054	0
1961	16,078	15,627	0	0	0	451			0	16,078	0
1962	26,379	25,989	0	0	0	390			0	26,379	0
1963	16,901	13,706	664	266	1,324	941			0	10,557	6,344
1964	7,273	3,545	1,541	92	955	1,140			0	3,316	3,957
1965	8,733	4,838	1,249	764	1,449	433			0	925	7,808
1966	15,583	9,505	1,341	1,093	2,632	1,012			0	3,760	11,823
1967	19,196	11,698	1,652	523	1,955	3,368			0	3,852	15,344
1968	30,940	14,374	1,673	297	1,658	12,938			0	11,182	19,758
1969	36,831	16,009	1,673	836	4,214	14,099			0	15,439	21,392
1970	37,858	11,737	1,248	1,566	6,703	16,604			0	22,729	15,129
1971	43,468	15,106	2,936	2,047	6,996	16,382			0	22,905	20,563
1972	53,080	12,758	3,531	3,857	11,599	21,320			15	28,538	24,542
1973	36,926	5,957	2,902	3,962	9,629	14,439			37	23,211	13,715
1974	34,545	4,258	2,477	4,207	7,590	16,006			7	25,466	9,079
1975	29,979	2,766	1,747	4,240	6,566	14,659			1	23,333	6,646
1976	31,684	2,923	1,659	4,837	6,479	15,782			4	25,397	6,287
1977	21,404	2,718	1,897	2,968	4,270	9,543			8	18,859	2,545
1978	10,394	1,193	821	1,419	3,090	3,870			1	9,158	1,236
1979	11,814	1,376	782	999	3,189	5,391			76	10,350	1,463
1980	10,444	2,205	275	1,450	3,027	3,461			26	8,396	2,048
1981	12,604	2,605	533	1,595	3,425	4,425			22	10,994	1,610
1982	12,048	3,238	964	1,489	2,885	3,457			15	10,204	1,844
1983	11,715	2,712	684	1,496	2,970	3,818			35	10,155	1,560
1984	14,109	3,336	1,061	1,326	3,463	4,618			305	10,292	3,817
1985	14,465	2,454	1,551	2,152	4,209	4,098			0	13,007	1,457
1986	28,892	4,184	3,285	4,067	9,105	8,175			75	21,576	7,316
1987	35,163	4,904	4,112	4,141	11,505	10,500			2	27,595	7,568
1988	38,406	4,006	3,616	3,789	14,505	12,473			18	29,282	9,124
1989	34,829	1,516	3,704	4,533	13,224	11,852			0	27,509	7,320
1990	32,115	2,606	2,412	2,251	13,786	11,030			30	26,598	5,518
1991	27,073	1,318	2,168	1,821	11,662	10,014			89	23,124	3,950
1992	24,932	586	1,497	2,401	11,135	9,171			142	21,614	3,318
1993	25,433	668	2,080	739	11,971	9,975	4,619	5,356	0	22,912	2,521
1994	23,580	694	1,727	539	9,377	11,243	4,493	6,750	0	20,642	2,938
1995	20,692	930	1,119	1,747	7,673	9,223	3,872	5,352	0	18,079	2,613
1996	17,393	648	764	1,649	6,773	7,558	2,899	4,659	0	15,206	2,187
1997	14,607	552	781	1,374	6,234	5,666	1,930	3,735	0	12,976	1,632
1998	13,874	563	535	1,432	5,922	5,422	1,956	3,467	0	12,387	1,487
1999	13,587	675	683	1,488	5,874	4,867	1,709	3,159	0	11,603	1,985
2000	15,570	742	1,049	1,587	6,173	6,020	2,066	3,953	0	13,551	2,019
2001	14,065	864	1,074	1,588	5,518	5,021	1,737	3,284	0	12,281	1,783
2002	14,748	1,144	1,119	1,865	6,180	4,441	1,550	2,891	0	12,505	2,243
2003	16,491	999	1,120	2,118	7,084	5,170	1,822	3,347	0	14,398	2,093
2004	17,670	1,038	955	2,170	7,457	6,050	2,250	3,800	0	16,014	1,656
2005	16,574	1,064	1,481	1,929	6,701	5,399	1,824	3,575	0	15,018	1,556
2006	15,339	1,037	1,132	2,140	5,870	5,161	1,865	3,296	0	14,097	1,242
2007	15,014	1,173	1,149	2,064	5,613	5,015	1,772	3,243	0	13,778	1,235
2008	14,626	1,135	900	1,670	5,547	5,373	2,055	3,318	0	13,504	1,122
2009	13,091	891	1,096	1,391	4,971	4,743	1,794	2,948	0	12,034	1,057
2010	11,915	754	1,076	1,351	4,477	4,258	1,576	2,682	0	10,912	1,004
2011	12,863	695	1,019	1,398	4,855	4,895	1,886	3,010	0	11,691	1,172
2012	11,877	559	884	1,179	4,651	4,605	1,890	2,715	0	10,950	927

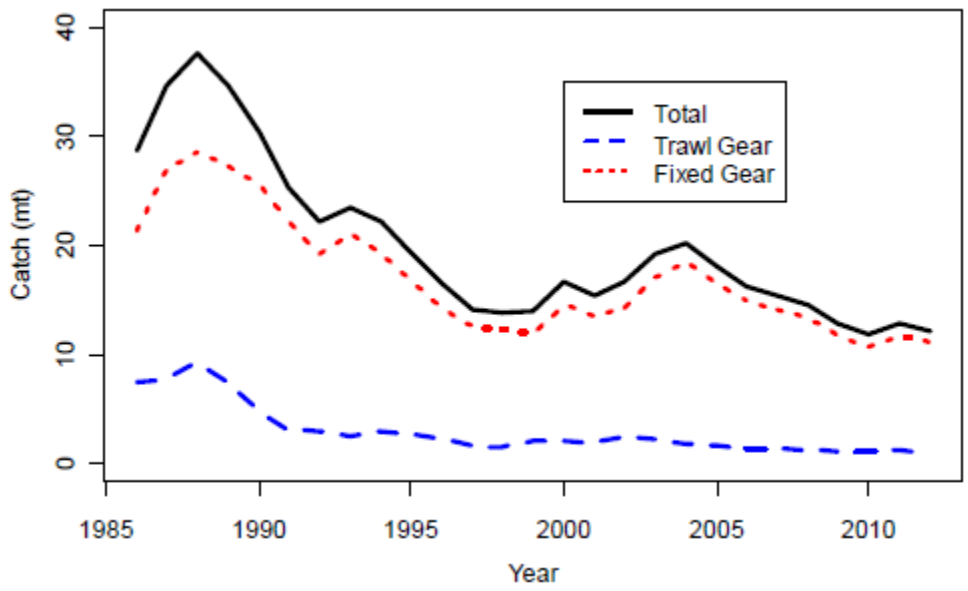


Figure 4.2. Long term and short term sablefish catch by gear type (thousands of metric tons) http://www.afsc.noaa.gov/REFM/Docs/2012/GOAsablefish.pdf

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

Table 4.3. 2012 IFQ sablefish allocations and IFQ landings.

				TAC		
Area	**Species**	**Vessel Landings**	**Total Catch Pounds**	**Allocation Pounds**	**Remaining Pounds**	**Percent Landed**
AI	sablefish	109	1,806,117	2,710,776	904,659	67
BS	sablefish	159	1,060,884	1,966,503	905,619	54
CG	sablefish	656	9,762,447	10,158,797	396,350	96
SE	sablefish	608	6,878,168	6,995,196	117,028	98
WG	sablefish	202	2,806,219	3,139,350	333,131	89
WY	sablefish	236	4,237,514	4,356,290	118,776	97
	Total	**1,970**	**26,551,349**	**29,326,912**	**2,775,563**	**91**

http://alaskafisheries.noaa.gov/ram/12ifqland.pdf

***e*Landings**

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

In 2011 Registered Buyers reported 6,907 landings: 6,650 vessel landings through IERS, 78 through the NMFS Web, and 15 manually in a nearly complete transition toward IERS. RAM could not

categorize 164 landings by reporting method. Although reporting methods have changed significantly, some users will continue to depend on both manual and NMFS Web reporting.

Pacific Halibut–Sablefish IFQ Report, Fishing Year 2012
http://alaskafisheries.noaa.gov/ram/12ifqland.pdf

State fishery data

The catches used in the Alaskan sablefish stock assessment includes catches from minor state-managed fisheries in the northern GOA and in the AI region because fish caught in these state waters are reported on the eLandings reporting system using the area code of the adjacent federal waters. The eLandings information feeds directly into the Alaska Regional Office catch reporting system the source of the catch data used in this assessment.
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

The Southeast Alaska catch data are shown in the table below from the ADFG website.

Year	Fishery	Total Quota	Individual Quota	Estimated Catch	Remaining Catch	Permits	Status
Year	Fishery	Total Quota	Individual Quota	Estimated Catch	Remaining Catch	Permits	Status
2013	NSEI Longline	1,002,162	12,848	429,179	572,983	78	Open
	SSEI Combined	583,280		429,259	154,021	23	Open
	SSEI Longline		25,360			20	Closed
	SSEI Pot		25,360			3	Open
2012	NSEI Longline	975,000	12,342	969,535	5,465	79	Closed
	SSEI Combined	583,280	25,360	521,825	61,455	23	
2011	NSEI Longline	880,000	10,602	882,779	-2,779	83	
	SSEI Combined	583,280	23,300	540,931	42,349	25	
2010	NSEI Longline	1,063,000	12,218	1,054,275	8,725	87	
	SSEI Combined	634,000	23,400	558,633	75,367	27	
2009	NSEI Longline	1,071,000	12,170	1,071,554		88	
	SSEI Combined	634,000	22,650	595,748		28	
2008	NSEI Longline	1,508,000	15,710	1,513,188		96	
	SSEI Combined	696,000	21,750	618,033		32	
2007	NSEI Longline	1,488,000	14,450	1,501,478		103	
	SSEI Combined	696,000	21,750	620,167		32	

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

International

The International Pacific Halibut Commission (IPHC) conducts a long line survey each year to assess Pacific halibut. This survey differs from the AFSC long line survey in gear configuration and sampling design, but catches substantial numbers of sablefish. Because the majority of effort occurs on the shelf in shallow depths, the IPHC survey may catch smaller and younger sablefish than the AFSC survey; however, measurements of sablefish are not taken on the IPHC survey. During the 2012 IPHC longline survey, 9,606 (extrapolated from subsample) sablefish were taken as bycatch.
http://www.iphc.int/data/survey/2012/2012ssaall_revised.pdf

Observer Program and data

At-sea and plant observers provide additional fishery data for length and age. On average observers cover 14% of the annual IFQ hook and line catch; in 2011 they covered 10% of the catch (1,319 mt). On average, the percent of the IFQ catch observed is lowest in the East Yakutat/SE (5%), highest in West Yakutat and AI (~22%), and moderate in the BS, Central Gulf, and Western Gulf (10-14%). Although the percent of catch observed is not highest in the Central Gulf, the number of sets and vessels observed is greatest in this area and lowest in the BS. In the BS, the average number of sets observed is only 22. Observer coverage in the AI was consistent in all years except 2005 when only 23 sets from six vessels were observed. Since then, the number of observed sets and vessels has increased. Low longline fishery sample sizes in the BS are likely a result of poor observer coverage for sablefish directed trips. Additionally, killer whales impact sablefish catch rates in the BS and AI and these sets are excluded from catch rate analyses.

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

The Observer Program allows NMFS to determine when and where to deploy observers using funds from fees based on the retained value of harvested groundfish and halibut fisheries. All sectors of the groundfish fishery, including vessels less than 60 feet LOA and the commercial halibut sector, are included in the new Observer Program. Coverage levels are no longer based on vessel length and processing volume; rather, NMFS has the flexibility to decide when and where to deploy observers based on management needs defined in a scientifically defensible deployment plan. Sampling by observers may occur at shoreside processors, floating processors, or onboard vessels at-sea.

Annual Deployment Plan for 2013

The first (2013) Annual Deployment Plan (ADP) places all vessels and processors into one of two observer coverage categories: (1) a full coverage category, and (2) a partial coverage category.

Full Coverage Category

The new Observer Program does not affect full observer coverage requirements for vessels > 125 feet or catcher processors and motherships that discard and process fish onboard. Other full coverage vessels include catcher vessels belonging to catch share programs with prohibited species caps, Bering Sea Alaska pollock vessels, and Gulf of Alaska rockfish vessels. They obtain observers using status-quo (pay as you go) methods for all their trips.

Partial Coverage Category

Vessels in the new partial coverage category have experienced substantial changes in how observers are deployed and paid for. The Partial Coverage category includes vessels whose fishing operations are not required by federal regulation to always carry an observer. This category is divided into two sampling strata depending on the method used to deploy observers: trip-selection and vessel-selection.

Trip Selection pool. This category applies to all catcher vessels of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 57.5 feet LOA. Each fall, owners of vessels placed in this pool will receive a letter that lists their vessels assigned to this pool and describes how to access and log trips into and Observer Declare and Deploy System (ODDS). NMFS developed ODDS, to facilitate the random assignment of observers to trips. Vessel owners or operators with vessel/s is in the trip selection pool will be required to log each fishing trip into ODDS and will be immediately informed if the trip has been randomly selected for observer coverage. The observer will be provided by a NMFS contractor. Vessel owners or operators in this pool must log fishing trips at least 72 hours before anticipated departure.

Vessel Selection pool

This category applies to catcher vessels fishing with hook-and- line and pot gear that are less than 57.5 feet LOA and, for the first year, greater than or equal to 40 feet LOA. Each fall, owners of vessels placed in this pool will receive a letter that lists their vessels assigned to this pool. Vessel owners or operators in this pool will not be required to log trips into ODDS. However, a subset of vessels, randomly selected by NMFS, will be required to take observers for every groundfish or halibut fishing trip that occurs during a specified 2-month period. Owners of selected vessels will be contacted by NMFS at least 30 days in advance of the 2-month period.

Zero Coverage pool

In the first year of the program, this category applies to all vessels less than 40 feet LOA and catcher vessels fishing with jig gear (which includes handline, jig, troll, and dinglebar troll gear). Vessel owners or operators in this pool will not be required to take observers for the first year of the program. Landings from vessels with zero coverage will still be assessed the landing fee.

Improved statistical reliability

These changes are intended to increase the statistical reliability of catch and bycatch data, address cost inequality among fishery participants, and expand observer coverage to previously unobserved fisheries. The sampling methods in the 2013 Annual Deployment Plan (ADP) achieves representative sampling of fishing events for vessels greater than or equal to 40 feet LOA and not fishing jig gear. As a result, the coverage rate is almost the same across all partially observed fisheries and it enables scientists to establish a baseline of unbiased observer data across all sectors. Moreover, the new Observer Program will provide better spatial and temporal distribution of observer coverage across all fisheries. It is intended to improve confidence in catch and bycatch estimation and the overall quality of data collected in all federal fisheries. These changes are intended to reduce bias in observer data, improve catch estimates, and lay the groundwork for cost-effective improvements to sampling methods implemented in future ADPs.

Observer Program Fees

Starting in 2013, processors and registered buyers will be required to pay an ex-vessel value-based fee to NMFS to support the funding and deployment of observers on vessels and in plants in the new partial observer coverage category. The fee is intended to be split evenly between the vessel owner/operator and processor or registered buyer. The observer fee is 1.25% of the ex-vessel value of the groundfish and halibut subject to the fee. Ex-vessel value will be based on standard ex-vessel prices from prior years.

Electronic monitoring

NMFS is working collaboratively with the Council to develop an Electronic Monitoring (EM) Strategic Plan to integrated video monitoring into the Observer Program. In 2013 pilot project, NMFS issued a contract to construct, deploy, and maintain a video based EM system on volunteering vessels in the vessel-selection pool. At the end of the study, NMFS will evaluate the efficacy of electronic monitoring to collect catch and discard data in the hook-and-line halibut and sablefish fleets on vessels between 40 ft LOA and 57.5 ft LOA.
http://alaskafisheries.noaa.gov/sustainablefisheries/observers/

Ecosystem data collection

Ecosystem characteristics of BS and AI, and GOA are assessed annually in the Ecosystem Considerations appendix to the BSAI and GOA SAFE Evaluation report. Since 1995, this document has been prepared in order to provide information about effects of fishing from an ecosystem perspective, and the effects of environmental change on fish stocks. Since 1999, the section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures. The Ecosystem Consideration document and report cards were updated for 2012 (see clause 13). http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

Each SAFE report is required to include an ecosystem section related specifically to the species being assessed. The sablefish ecosystem information was updated for the 2012 SAFE report. (see clause 13 for more information) http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

Socio-economic data collection

The Economic and Social Sciences Research Program within NMFS's Resource Ecology and Fisheries Management (REFM) Division provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Data is presented in an annual economic status report, most recently in 2012 (Figure 4.3.). http://www.afsc.noaa.gov/REFM/ Socioeconomics/Default.php

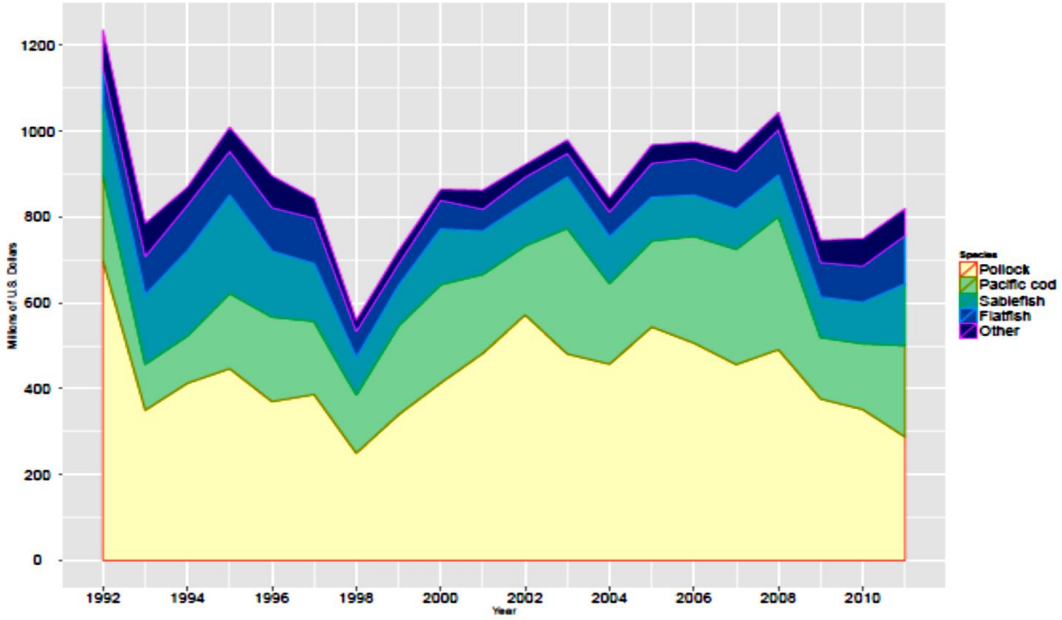


Figure 4.3. Real ex-vessel value of the groundfish catch in the domestic commercial fisheries of Alaska by species, 1992-2011 (base year = 2011)

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

Evidence:

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (In: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

NOAA/AFSC, 2012. Ecosystem Considerations. 2012
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

NOAA, 2012. Economic Status of the Groundfish Fisheries Off Alaska, 2011. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/Docs/2012/economic.pdf

NOAA / AFSC. Survey protocol for the Alaska sablefish longline survey. By Michael F. Sigler and Chris R. Lunsford
http://www.afsc.noaa.gov/ABL/MESA/pdf/LSprotocols.pdf

ADFG, 2013. Northern Southeast Inside Sablefish Quota Announcement. Posted on July 19th, 2013.
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/293718980.pdf

ADFG / Fishing
http://www.adfg.alaska.gov/

NOAA 2011. Pacific Halibut–Sablefish IFQ Report • Fishing Year 2011
https://alaskafisheries.noaa.gov/ram/ifq/rtf11.pdf

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

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

FAO Eco 29-29.3

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The mission of the NMFS/AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The updated point estimates of B40%, F40%, and F35% from this assessment are 106,506 t (combined across the EBS, AI, and GOA), 0.095, and 0.113, respectively. Projected female spawning biomass (combined areas) for 2013 is 97,193 t (91% of B40%), placing sablefish in sub-Tier "b" of Tier 3. Apart from new data, there are no model changes in 2012 relative to 2011. ADFG annual longline research surveys began in 1988 in both Northern southeast inside (NSEI) and Southern southeast inside (SSEI) subdistricts to assess the relative abundance of sablefish over time and differing environmental conditions. Mark-recapture studies for sablefish are also carried out in NSEI. The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The Aleutian Island fishery is set as 5% of the BSAI federal TAC. The Prince William Sound sablefish fishery is managed using a GHL and derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Ecosystem considerations for this fishery are reported in the sablefish SAFE report.

Research institutions and scientific capacity

Federal

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

Federal waters stock assessment model

The sablefish population is assessed with an age-structured model. The assessment uses a statistical, forward-projecting age structured model which estimates population numbers and mortality rates separately for male and female sablefish. The model is fitted using data on catches, length/age compositions and CPUE from the fisheries, and several series of abundance indices and associated age or length compositions from longline and trawl surveys. Much of the biological

information for estimates of these factors comes from annual longline surveys, observer samples of the fishery, and fishery logbooks, but tagging results can be used as an independent check on these results.

Table 5.1. Summary of data sources, types and years for the sablefish fishery.

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

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

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

Major changes relative to last assessment:

Input data: New data included in the assessment model were relative abundance and length data from the 2012 longline survey, relative abundance and length data from the 2011 longline and trawl fisheries, age data from the 2011 longline survey and 2011 fixed gear fishery, updated 2011 catch and projected 2012 catch.

Model changes: There are no model changes.

Stock assessment results and Stock Status

Quantity/Status	As estimated or specified *last* year for: 2012	2013	As estimated or recommended *this* year for: **2013**	2014*
M (natural mortality)	0.10	0.10	0.10	0.10
Tier	3b	3b	3b	3b
Projected total (age 2+) biomass (t)	262,522	268,992	248,473	255,103
Female spawning biomass (t)				
Projected	101,325	98,983	97,193	94,964
$B_{100\%}$	271,436	271,436	266,264	266,264
$B_{40\%}$	108,574	108,574	106,506	106,506
$B_{35\%}$	95,003	95,003	93,192	93,192
F_{OFL}	0.106	0.106	0.102	0.100
$maxF_{ABC}$	0.089	0.089	0.086	0.084
F_{ABC}	0.089	0.089	0.086	0.084
OFL (t)	20,400	20,132	19,180	18,000
max ABC (t)	17,240	17,019	16,230	15,220
ABC (t)	17,240	17,019	**16,230**	15,220
Status	As determined *last* year for: 2010	2011	As determined *this* year for: 2011	2012
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 12,970 t and 12,120 t used in place of maximum permissible ABC for 2013 and 2014. This was done in response to management requests for a more accurate two-year projection.

The fishery abundance index was flat from 2010 to 2011 (the 2012 data are not available yet). The longline survey abundance index decreased 21% from 2011 to 2012 following an 18% increase from 2008 to 2011. Spawning biomass is projected to decrease from 2013 to 2017, and then stabilize.

Projected 2013 spawning biomass is 37% of unfished spawning biomass. Spawning biomass has increased from a low of 30% of unfished biomass in 2002 to 37% projected for 2013. The 1997 year class has been an important contributor to the population but has been reduced and should comprise less than 10% of the 2013 spawning biomass. The 2000 year class is still the largest contributor, with 20% of the spawning biomass in 2013. The 2008 year class is beginning to show signs of strength and will comprise 5% of spawning biomass in 2013 even though it is only 40% mature.

Acceptable Biological Catch (ABC). The maximum permissible ABC for 2013 from an adjusted F40% strategy is 16,230 tons from federal waters (GOA and BSAI). The maximum permissible ABC for 2013 is a 6% decrease from the 2012 ABC of 17,240 t. This decrease is supported by a substantial decrease in the domestic longline survey index in 2012 compared to relatively high survey years in 2010 and 2011. The fishery abundance index was steady which moderated the decrease in ABC. Spawning biomass is projected to decline through 2017, and then is expected to increase, assuming average

recruitment is achieved. This year's survey turned future projections downward and predicted maximum permissible ABC to decrease to 15,220 t in 2014 and remain steady at 15,220 t in 2015.

Table 5.2. Model results: specified and recommended reference points for 2012 to 2014. (NOAA / AFSC, December 2012)

Plan team summaries

Area	Year	Biomass (4+)	OFL	ABC	TAC	Catch
GOA	2011	149,000	13,340	11,290	11,290	11,148
	2012	180,000	15,330	12,960	12,960	10,434
	2013	167,000	14,780	12,510		
	2014	164,000	13,871	11,731		
BS	2011	37,000	3,360	2,850	2,850	695
	2012	30,000	2,640	2,230	2,230	559
	2013	19,000	1,870	1,580		
	2014	19,000	1,755	1,482		
AI	2011	25,000	2,250	1,900	1,900	1,019
	2012	26,000	2,430	2,050	2,050	884
	2013	26,000	2,530	2,140		
	2014	28,000	2,374	2,007		

Year	2012				2013		2014	
Region	OFL	ABC	TAC	Catch*	OFL	ABC	OFL	ABC
BS	2,640	2,230	2,230	559	1,870	1,580	1,755	1,482
AI	2,430	2,050	2,050	884	2,530	2,140	2,374	2,007
GOA	15,330	12,960	12,960	10,434	14,780	12,510	13,871	11,731
W	--	1,780	1,780	1,179	--	1,750	--	1,641
C	--	5,760	5,760	4,651	--	5,540	--	5,195
WYAK	--	2,247	2,247	1,890	--	2,030	--	1,902
SEO	--	3,173	3,173	2,715	--	3,190	--	2,993
Total	20,400	17,240	17,240	11,877	19,180	16,230	18,000	15,220

*Current as of September 29, 2012 Alaska Fisheries Information Network, (www.akfin.org).

Model update and review

The 2011 and 2012 stock assessment models are identical in all aspects except for inclusion of new data which slightly modify values for some model parameters. A model review group evaluated the 2012 model and concluded that it produces good visual fits to the data and provides biologically reasonable patterns of recruitment, abundance, and selectivities.

The 2012 update shows a slight decrease in recent recruitment and a slight decrease in spawning and total biomass from previous projections. SAFE authors concluded that the 2012 model is utilizing the new information effectively, and they used it to recommend 2013 ABC and OFL.

To update the 2011 stock assessment, the 2012 model included new data for: abundance and length data from the 2012 longline survey; relative abundance and length data from the 2011 longline and trawl fisheries; age data from the 2011 longline survey and 2011 fixed gear fishery; and updated 2011 catch and projected 2012 catch.

Table 5.3. Changes to key parameters and reference points in 2011 (left side, grey) and 2012 (right side, white) stock assessments.
(NOAA / AFSC, December 2012)

Key parameters		
Number of parameters	210	213
$B_{next\ year\ (Female\ spawning\ biomass\ for\ next\ year)}$	101	97
$B_{40\%\ (Female\ spawning\ biomass)}$	108	107
$B_{1960\ (Female\ spawning\ biomass)}$	180	176
$B_{0\%\ (Female\ spawning\ biomass)}$	271	266
SPR% current	37.3%	36.5%
$F_{40\%}$	0.096	0.095
$F_{40\%\ (adjusted)}$	0.089	0.086
ABC	**17.2**	**16.2**
$q_{Domestic\ LL\ survey}$	7.8	7.8
$q_{Japanese\ LL\ survey}$	6.3	6.3
$q_{DomesticLL\ fishery}$	4.1	4.1
$q_{Trawl\ Survey}$	1.3	1.4
$a_{50\%\ (domestic\ LL\ survey\ selectivity)}$	3.9	3.8
$a_{50\%}$ (LL fishery selectivity)	4.1	4.0
μ_r *(average recruitment)*	18.0	17.8
σ_r *(recruitment variability)*	1.20	1.20

Future model developments

NMFS stock assessment scientists responded to requests from the Scientific and Statistical Committee (SSC) and Groundfish Plan Group to consider new data sources and model parameters and their implications for management. These include total catch accounting, retrospective analysis, impact of whale depredation, ecosystem influences, and development of spatially-explicit stock assessment models. The 2012 SAFE document provides a review of progress in each of these areas.

Total catch accounting

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

Non-commercial harvest

The dataset for non-commercial removals estimates total removals that do not occur during directed groundfish fishing activities. This includes removals incurred during research, subsistence, personal use, recreational, and exempted fishing permit activities, but does not include removals taken in fisheries other than those managed under the groundfish FMP. The sablefish research removals are substantial relative to the fishery catch, especially when compared to the research removals for many other species. Total removals from activities other than directed fishery were near 359 tons

in 2010. This was 2.2% of the 2011 recommended ABC of 16,040. Removals in 2011 were lower at 312 tons. At these low levels, these removals represent a relatively low risk to the sablefish stock. In 2011 scientists conducted model runs that accounted for removals resulting in ABC increases.

Halibut Fishery Incidental Catch Estimation (HFICE)

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

These estimates are for total catch of groundfish species in the halibut IFQ fishery and do not distinguish between "retained" or "discarded" catch. These estimates should be considered a separate time series from the current CAS estimates of total catch. Because of potential overlaps HFICE removals should not be added to the CAS produced catch estimates. The overlap will apply when groundfish are retained or discarded during an IFQ halibut trip. IFQ halibut landings that also include landed groundfish are recorded as retained in *e*Landings and a discard amount for all groundfish is estimated for such landings in CAS. Discard amounts for groundfish are not currently estimated for IFQ halibut landings that do not also include landed groundfish. For example, catch information for a trip that includes both landed IFQ halibut and sablefish would contain the total amount of sablefish landed (reported in *e*Landings) and an estimate of discard based on at-sea observer information. Further, because a groundfish species was landed during the trip, catch accounting would also estimate discard for all groundfish species based on available observer information and following methods described in Cahalan et al. (2010). The HFICE method estimates all groundfish caught during a halibut IFQ trip and thus is an estimate of groundfish caught whether landed or discarded. This prevents simply adding the CAS total with the HFICE estimate because it would be analogous to counting both retained and discarded groundfish species twice. Further, there are situations where the HFICE estimate includes groundfish caught in State waters and this would need to be considered with respect to ACLs (e.g. Chatham Strait sablefish fisheries). Therefore, the HFICE estimates should be considered preliminary estimates for what is caught in the IFQ halibut fishery. Improved estimates of groundfish catch in the halibut fishery may become available following restructuring of the Observer Program in 2013.

The HFICE estimates of sablefish catch by the halibut fishery are substantial and represent approximately 10% of the annual sablefish ABC. See Table 5.4. Sablefish and halibut are often caught and landed in association with each other by the IFQ fishery. It is unknown what level of sablefish catch reported here is already accounted for as IFQ harvest in the CAS system because the HFICE estimates do not separate retained and discarded catch. If these were strictly additive removals, 10% would represent a significant amount of additional mortality and a potential risk to the stock, but how much is additive is unknown. The HFICE estimates may represent some valuable discard information for sablefish, but that level is unknown until these estimates are separated from the IFQ landings and CAS system.

Table 5.4. Estimates of Alaska sablefish catch (t) from the Halibut Fishery Incidental Catch Estimation

(HFICE) working group. AI = Aleutian Islands, WGOA = Western Gulf of Alaska, CGOA = Central Gulf of Alaska, EGOA = Eastern Gulf of Alaska, PWS = Prince William Sound.

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

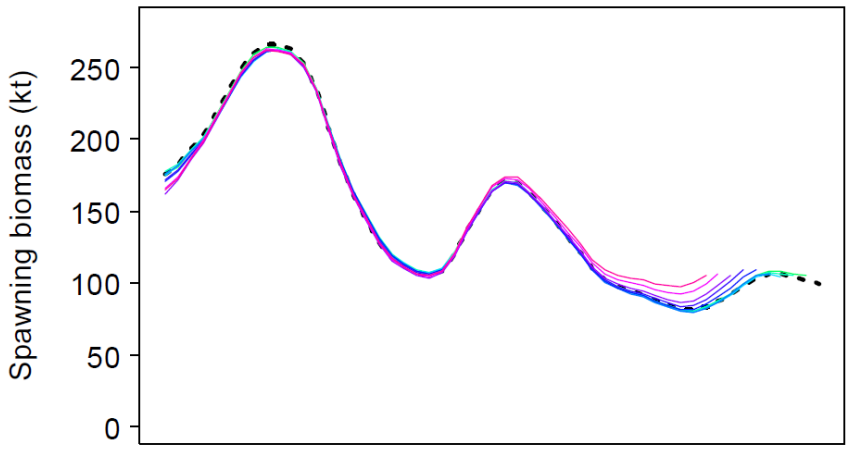
*These areas include removals from the state of Alaska.

(NOAA / AFSC, December 2012)

Retrospective analysis

For the 2012 stock assessment, scientists presented retrospective trends in spawning biomass and total biomass for ten previous assessment years (2002-2011) and compared estimates from the current preferred model. Each year of the assessment generally adds one year of longline fishery lengths, trawl fishery lengths, longline survey lengths, longline and fishery ages (from one year prior), fishery abundance index, and longline survey index. Every other year, a trawl survey estimate and corresponding length composition are added. In the first five years of the retrospective plot we see that estimates of spawning biomass were consistently lower for the last few years in the next assessment year (Figure 5.1).

In recent years, the retrospective plot of spawning biomass shows only small changes from year to year. This retrospective pattern is unlikely to be considered severe, but at issue is the “one-way” pattern in the early part of the time series. The model appears to have an inertia that is difficult to overcome. It is difficult to isolate the cause of this pattern but several possibilities exist. For example, hypotheses could include environmental changes in catchability, time-varying natural mortality, or changes in selectivity of the fishery or survey. One other issue is that fishery abundance and lengths, and all age compositions are added into the assessment with a one year lag to the current assessment.



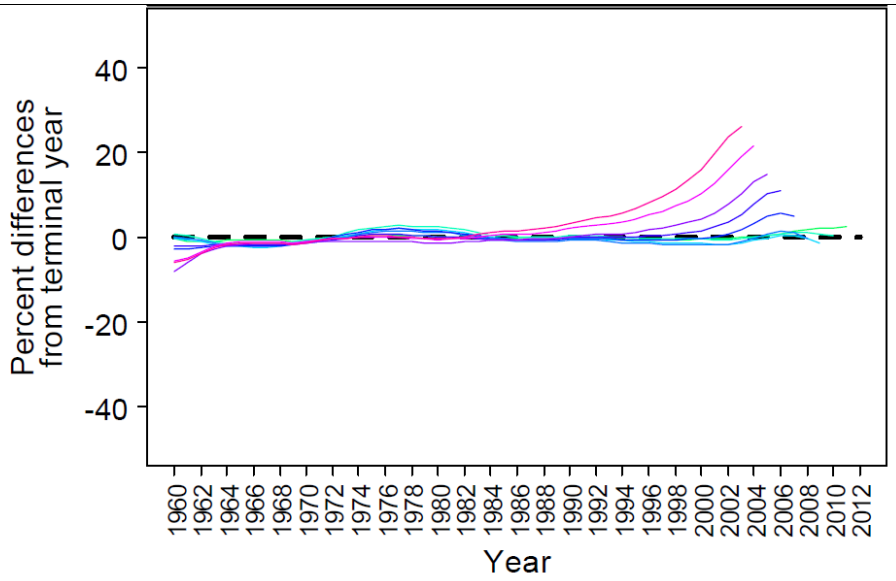


Figure 5.1. Retrospective trends for spawning biomass (top) and percent difference from terminal year (bottom) from 2002-2012.

Whale depredation

Modelers are estimating whale effects with appropriate variance for both killer whale and sperm whale depredation using generalized linear mixed models. Preliminary simulations show that sperm whale effects may be useful to incorporate in an index, but killer whale effects are too variable to use as a correction factor. A forthcoming paper has been drafted that examines killer whale effects on multiple species. Scientists hope to incorporate a new survey index in 2013, or first having it reviewed by an expected CIE review in spring, 2014.

Ecosystem influences.

A new publication by Shotwell et al. (2012) investigates the utility of incorporating environmental indices within the sablefish assessment model through multistage hypothesis testing, retrospective predictive modeling, and impact analysis. The best models suggest that advection along large-scale oceanographic features such as the North Pacific Polar Front may aid in understanding the spawner-recruit relationship for sablefish. Additionally, scientists provided a conceptual model termed the Ocean Domain Dynamic Synergy (ODDS) that combines three mechanisms influencing sablefish recruitment. This ODDS model may be used for future research on sablefish recruitment and hypothesis testing of potential explanatory variables to be considered for use in the assessment model.

Spatially-explicit models and tagging studies

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

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

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

Sablefish moved large distances throughout the 39 years of tagging. Mean great-circle distance moved in one year over all size groups was 148 km (80 nautical miles (nmi)), and 626 km (338 nmi) over all time at liberty. These distances are calculated as point-to-point, so they surely are minimum distances. Female sablefish moved slightly farther on average than male fish. The longest a recaptured tagged fish has been at liberty is slightly over 37 years from a fish tagged in 1973 and recovered in 2010. Over half of all recovered tagged fish were recovered within 10 years of being tagged: 33% of tagged fish were recovered within 2 years of their release, 28% were recovered 3-5 years following their releases, and 24% were recovered 6-10 years following their release.

Because of the high movement rates determined by the tag data, it has been shown that apportionments can be flexible to achieve other objectives, while still maintaining spawning biomass.

State fisheries stock assessment

For state-managed fisheries, ADFG has a well-developed research capacity. The state's Policy and Planning Committee establish research priorities.

In state waters, ADFG manages five sablefish fisheries outside the IFQ program. Three major state fisheries exist which are limited entry and are located in Prince William Sound (PWS), Northern Southeast Inside (NSEI) (or Chatham Strait) and Southern Southeast Inside (SSEI) (or Clarence Strait). The Cook inlet and Aleutian Islands fishery are smaller fisheries than the other three. The Cook Inlet,

Prince William Sound and the Aleutian Islands state fisheries are managed using NMFS assessment data, historical catches and effort, projected catch and effort, and a yield-per-unit-area model, among other parameters.

Southeast Alaska

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

State scientists estimate acceptable biological catch (ABC) and annual harvest objective (AHO) for NSEI (Chatham Strait) and SSEI (Clarence Strait) managements units in Southeast Alaska. In the NSEI AHO is calculated by applying a harvest rate to a forecasted biomass based on current year abundance measures with a mark-recapture study. The ABC increased 4% in 2013 to 1,207,282 pounds from 1,160,674 pounds in 2012 ABC. Total sablefish abundance decreased 7% from the last abundance estimate in 2010; however the increase in 2013 ABC was due primarily to updated sablefish length, age, and maturity data used in the harvest rate calculation and biomass forecast. An F50% biological reference point (BRP) was used for calculating the 2013 ABC, resulting in a harvest rate of 7.8%. Commercial fishery catch per unit effort (CPUE) increased slightly in 2012 from 2011 levels; longline survey CPUE measured in pounds per hook was stable.

Key model parameters include:
Natural mortality (M) = 0.1
Harvest rate (F(50%) = 0.7
Selectivity (of year 5 + fish into the fishery)
ABC (NSEI) = 1,046,873
AHO (NSEI) = 888,000

In the SSEI AHO is calculated based on fishery and survey CPUE, historical landings, and biological information about the population.

Cook Inlet

The Cook Inlet fishery is managed using a Guideline Harvest Level (GHL) based on harvest history, fishery performance, and the federal survey for the area. The fishery GHL is adjusted yearly in proportion of the percentage annual change in sablefish total allowable catch (TAC) set by the NPFMC for federal waters of the CGOA. Because sablefish in the Cook Inlet Area are believed to be

part of the GOA stock, adjusting the state GHL proportional to changes in the CGOA TAC is a conservative approach for sablefish management. Sablefish GHL for Cook Inlet in 2013 is 66, 000 pounds.
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/240783172.pdf

Prince William Sound
The Prince William Sound sablefish fishery is managed for a GHL set as the midpoint of a guideline harvest range derived from the estimated area of sablefish habitat and a yield-per-unit-area model. Fishing season length is based on the GHL, estimated number of participants, and past catch rates. For 2013, the 242,000-pound GHL is divided among registered permit holders under the shared quota approach described in regulation 5 AAC 28.272.

http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/240783172.pdf
http://www.adfg.alaska.gov/FedAidPDFs/FMR13-04.pdf
http://www.sf.adfg.state.ak.us/FedAidPDFs/RIR.2C.1987.04.pdf

Aleutian Islands
The Aleutian Islands state waters sablefish GHL is calculated at 5% of the combined BSAI total allowable catch. ADFG does not conduct stock assessment but relies on NMFS assessments to set the GHL. Adjustments to the calculated GHL have been made in some years based on prior state waters seasons fishery performance or to compensate for harvest occurring after the previous year's fishery closure. From 1995 to 2011, Aleutian Islands state waters sablefish GHLs have ranged from 250,000 to 660,000 pounds. The guideline harvest level for the 2013 Aleutian Islands state-waters sablefish fishery is 442,000 pounds.
http://www.adfg.alaska.gov/FedAidPDFs/FMR12-38.pdf
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/255960594.pdf

Evidence:
ADFG Sablefish Meeting March 8, 2012
http://www.scribd.com/fullscreen/91606618?access_key=key-4ld6z5dumwp4tvok934&allow_share=false&show_recommendations=false

ADFG. 2012 Report to the Alaska Board of Fisheries, Groundfish Fisheries: Southeast Alaska and Yakutat Fishery Management Report 11-70, Kristin Green, et al. December 2011.
http://www.adfg.alaska.gov/FedAidPDFs/FMR11-70.pdf
http://www.scribd.com/fullscreen/91606618?access_key=key-4ld6z5dumwp4tvok934&allow_share=false&show_recommendations=false

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

NOAA/AFSC, 2012. Ecosystem Considerations. 2012
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

NOAA / NMFS, 2013. Report to industry on the Alaska sablefish tag program, 1972 - 2012. Echave, K. B., D. H. Hanselman, and N. E. Maloney. NOAA Tech. Memo. NMFS-AFSC-254, 47 p.
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-254.pdf

Shotwell, S.K., D.H. Hanselman, and I.M. Belkin. 2012. Toward biophysical synergy: Investigating advection along the Polar Front to identify factors influencing Alaska sablefish recruitment.
Deep-Sea Res. II, http://dx.doi.org/10.1016/j.dsr2.2012.08.024.

Southeast Alaska Fishermen's Alliance
http://www.seafa.org/?p=190

NOAA, 2012. Economic Status of the Groundfish Fisheries Off Alaska, 2011. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/Docs/2012/economic.pdf

C. The Precautionary Approach

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

FAO CCRF 7.5.2/7.5.3

Eco 29.2/29.2bis/30-30.2

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The Tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. The limit reference point is ½ MSY or $B_{17.5\%}$. The probability that next year's spawning biomass was below B35% was 0.17. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.7 (up from 0.6 last year), and the probability of staying below B40% is near 100%. In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA.

The harvest control rule applied to sablefish is recognized as being effective at maintaining the stock at a biomass capable of producing maximum sustainable yield. When stock size falls below a target, the harvest rate is reduced to promote rebuilding to the target. The current biomass of sablefish is estimated to be below the B40% target, and consequently the TAC for the next year will be determined by the rule in Tier 3b, e.g. the harvest rate will be below the maximum allowed.

The Tier System

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

Harvest control rule

The sablefish stock in Alaska is managed under Tier 3. For these stocks, the spawner-recruit

relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. In Tiers 1–3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. The control rule is a biomass-based rule, for which fishing mortality is constant when biomass is above the target and declines linearly down to a threshold value when biomass drops below the target.

Sablefish reference points

Reference points are calculated using recruitments from 1979-2011. The updated point estimates of *B40%, F40%,* and *F35%* from the 2012 assessment are 106,506 t, 0.095, and 0.113, respectively (combined across the EBS, AI, and GOA). Projected female spawning biomass (combined areas) for 2013 is 97,193 t (91% of *B40%*), placing sablefish in sub-Tier "b" of Tier 3. The OFL fishing mortality rate is 0.102 which translates into a 2013 OFL (combined areas) of 19,180 t.

Stock assessors estimated the posterior probability that projected abundance will fall, or stay below thresholds of 17.5% (MSST), and 35% (MSY), and 40% (B_{target}) of the unfished spawning biomass based on the posterior probability estimates. Abundance was projected for 14 years. For management, it is important to know the risk of falling under these thresholds. The probability that spawning biomass falls below key biological reference points was estimated based on the posterior probability distribution for spawning biomass. The probability that next year's spawning biomass was below *B35%* was 0.17. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.7 (up from 0.6 last year), and the probability of staying below B40% is near 100% (Figure 6.1).

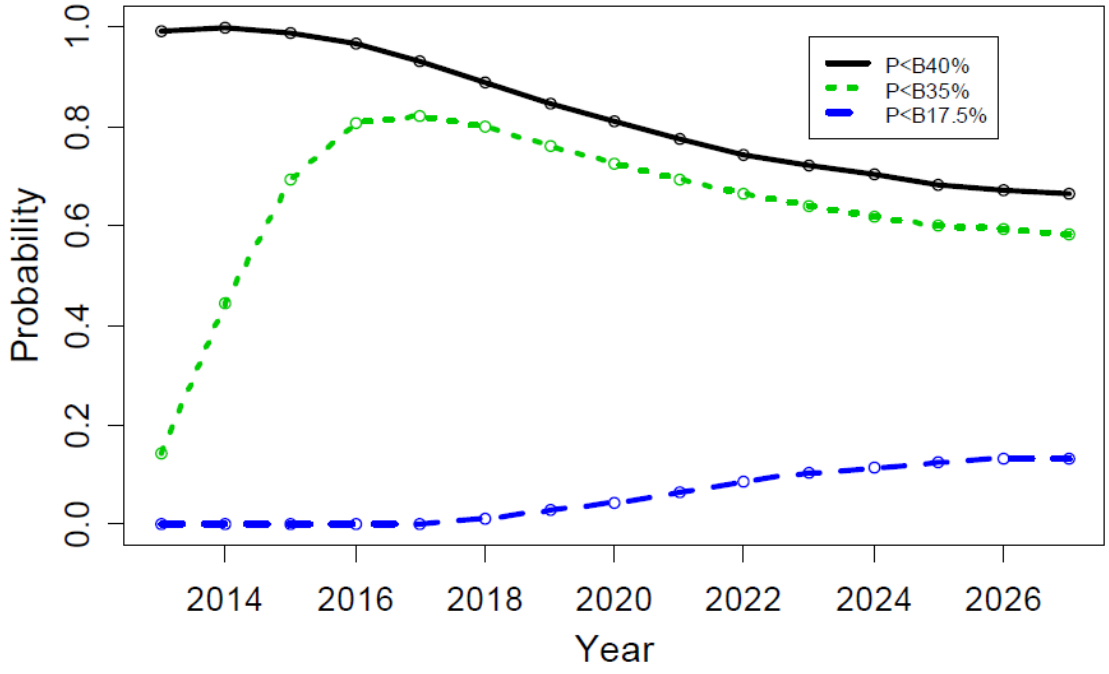


Figure 6.1.a. Probability that projected spawning biomass (from MCMC) will fall below $B_{40\%}$, $B_{35\%}$ and $B_{17.5\%}$.

Table 6.1.b. Sablefish spawning biomass (kilotons), fishing mortality, and yield (kilotons) for seven harvest scenarios. Abundance projected using 1979-2009 recruitments. Sablefish are not classified as overfished because abundance currently exceeds B35%.

Year	Maximum permissible F	Author's F* (specified catch)	Half max. F	5-year average F	No fishing	Overfished?	Approaching overfished?
			Spawning biomass (kt)				
2012	99.4	99.4	99.4	99.4	99.4	99.4	99.4
2013	97.2	97.2	97.2	97.2	97.2	97.2	97.2
2014	93.4	95.0	97.0	95.4	101.3	91.9	93.4
2015	90.5	93.3	96.7	94.0	105.7	87.9	90.5
2016	88.9	91.4	96.0	93.6	111.0	85.6	87.7
2017	89.4	91.4	95.3	95.0	118.1	85.4	87.1
2018	91.5	93.2	95.7	98.1	127.0	86.9	88.2
2019	94.3	95.7	97.7	101.9	136.8	89.1	90.2
2020	97.2	98.3	99.9	105.9	146.8	91.4	92.2
2021	100.0	100.8	103.2	109.7	156.6	93.6	94.2
2022	102.4	103.0	108.3	113.3	165.9	95.4	95.9
2023	104.5	105.0	112.0	116.5	174.7	97.1	97.4
2024	106.5	106.9	114.6	119.5	183.0	98.6	98.8
2025	108.2	108.5	119.3	122.2	190.8	99.9	100.1
			Fishing mortality				
2012	0.063	0.063	0.063	0.063	0.063	0.063	0.063
2013	0.086	0.068	0.043	0.063	-	0.102	0.102
2014	0.082	0.066	0.043	0.063	-	0.097	0.097
2015	0.080	0.082	0.043	0.063	-	0.092	0.092
2016	0.078	0.080	0.042	0.063	-	0.089	0.089
2017	0.077	0.078	0.042	0.063	-	0.088	0.088
2018	0.076	0.077	0.042	0.063	-	0.087	0.087
2019	0.076	0.077	0.043	0.063	-	0.086	0.086
2020	0.076	0.077	0.044	0.063	-	0.086	0.086
2021	0.076	0.077	0.046	0.063	-	0.087	0.087
2022	0.077	0.077	0.047	0.063	-	0.088	0.088
2023	0.078	0.078	0.047	0.063	-	0.088	0.088
2024	0.078	0.079	0.047	0.063	-	0.089	0.089
2025	0.079	0.080	0.047	0.063	-	0.091	0.091
			Yield (kt)				
2012	12.0	12.0	12.0	12.0	12.0	12.0	12.0
2013	16.2	16.2	8.3	12.1	-	19.2	16.2
2014	14.7	15.2	8.1	11.7	-	16.9	14.7
2015	14.4	15.2	8.4	11.9	-	16.1	17.0
2016	14.9	15.6	9.1	12.6	-	16.6	17.2
2017	15.7	16.2	9.7	13.2	-	17.2	17.7
2018	16.2	16.6	10.2	13.7	-	17.8	18.2
2019	16.9	17.2	10.7	14.2	-	18.5	18.7
2020	17.4	17.6	11.2	14.7	-	19.0	19.2
2021	17.9	18.1	11.6	15.0	-	19.5	19.6
2022	18.4	18.5	12.0	15.4	-	20.0	20.1
2023	18.8	18.9	12.4	15.8	-	20.4	20.5
2024	19.3	19.3	12.7	16.1	-	20.8	20.9
2025	19.8	19.9	13.1	16.4	-	21.4	21.4

* Projections in Author's F (Alternative 2) are based on estimated catches of 12,970 t and 12,120 t used in place of maximum permissible ABC for 2013 and 2014. This was done in response to management requests for a more accurate two-year projection.

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

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

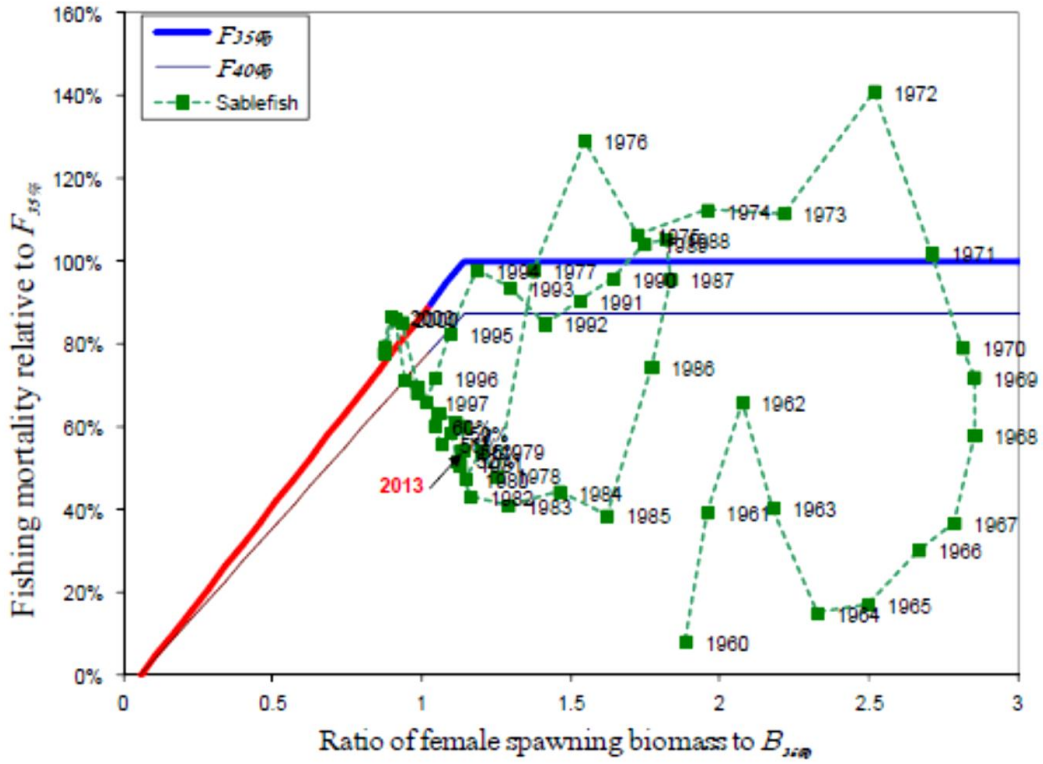


Figure 6.2. Phase-plane diagram of time series of sablefish estimated spawning biomass relative to the unfished level and fishing mortality relative to F_{OFL} for author recommended model. http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

2013 Acceptable Biological Catch

The 2012 stock assessment recommended a 2013 ABC of 16,230 t. It represents the maximum permissible ABC for 2013 from an *F40%* strategy. The maximum permissible ABC for 2013 is a 6% decrease from the 2012 ABC of 17,240 t. This decrease is supported by a substantial decrease in the domestic longline survey index in 2012 that offset relatively high survey years in 2010 and 2011.

Spawning biomass

Projected 2013 spawning biomass is 37% of unfished spawning biomass. Spawning biomass has increased from a low of 30% of unfished biomass in 2002 to the 37% projected 37% for 2013. The 1997 year class has been an important contributor to the population but now comprises less than 10% of the 2013 spawning biomass.

The 2000 year class is the largest contributor, with 20% of the spawning biomass in 2013. The 2008 year class is beginning to show signs of strength and will comprise 5% of spawning biomass in 2013 even though it is only 40% mature.

Spawning biomass is projected to decline through 2017, and then is expected to increase, assuming average recruitment is achieved. This year's survey turned the projection downward, predicting maximum permissible ABC to decrease in 2014 at 15,220 t and remain steady at 15,220 t in 2015.

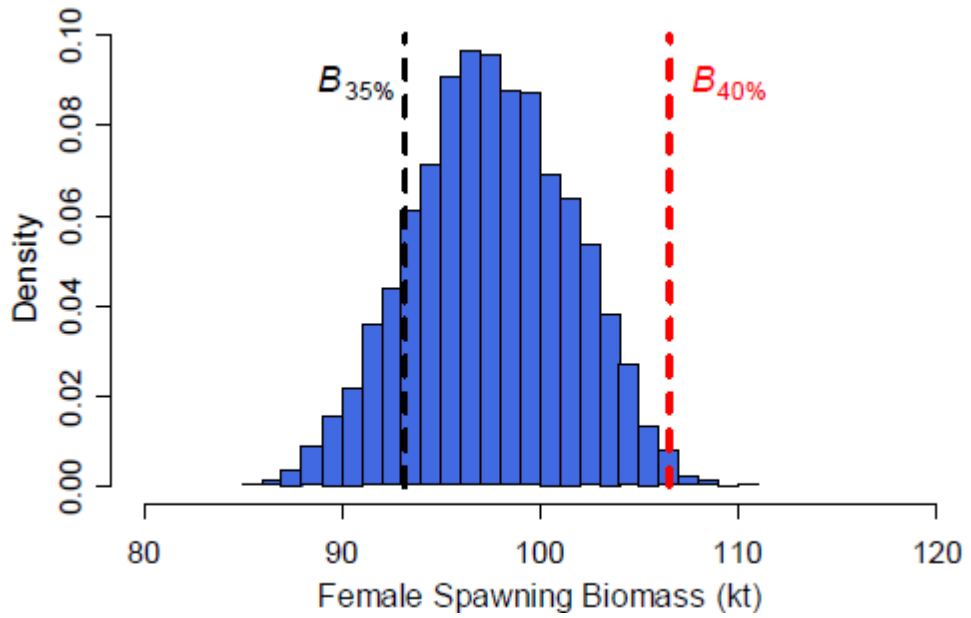


Figure 6.3. Posterior probability distribution for projected spawning biomass (thousands t) in 2013. http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

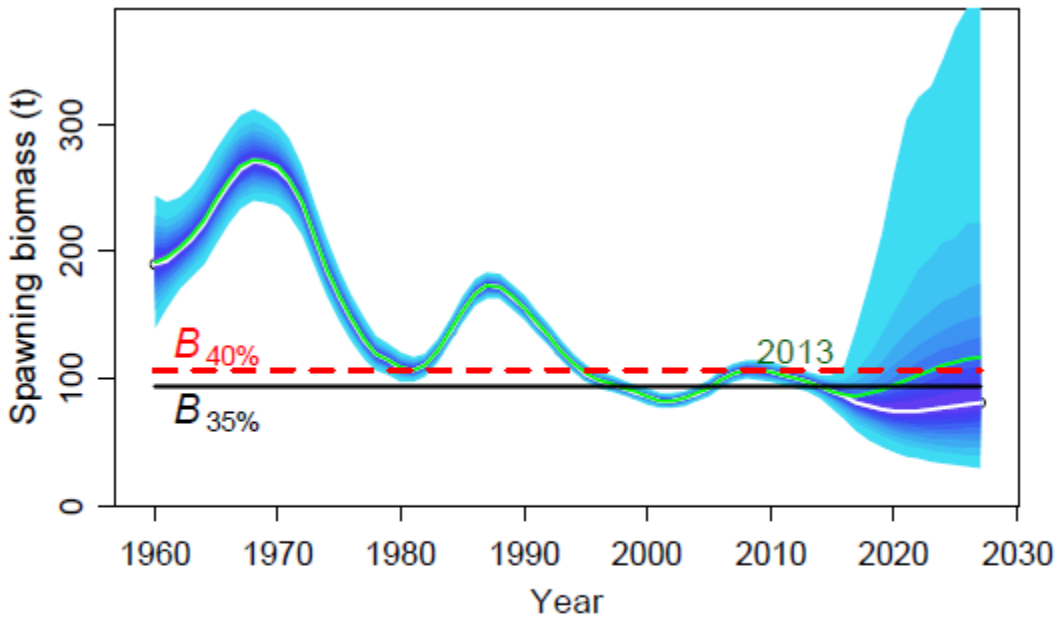


Figure 6.4. Estimate of female spawning biomass (thousand t) and their uncertainty. White line is the median and green line in the mean, shaded files are 5% increments of the posterior probability distribution of spawning biomass based on 20 million MCMC simulations. Width of shaded areas is the 95% credibility interval. Harvest policy is the same as the projections in scenario 2 (Author's F). http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

State Fisheries

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

Evidence:

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. . (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf

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

FAO CCRF 7.5.1/7.5.4/7.5.5
FAO ECO 29.6/32

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

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

Optimum Yield

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

Tier System

The second element of precautionary approach is the Tier system, based on knowledge and uncertainties of the stock in question. NPFMC inaugurated the Tier system in fisheries management: the harvest control rule depends on the amount of information available. The less the information about a given stock, the more conservative is the catch allowed. Currently, sablefish in Alaska is managed under Tier 3, where sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level.

OFL, ABC, ACL and TAC

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

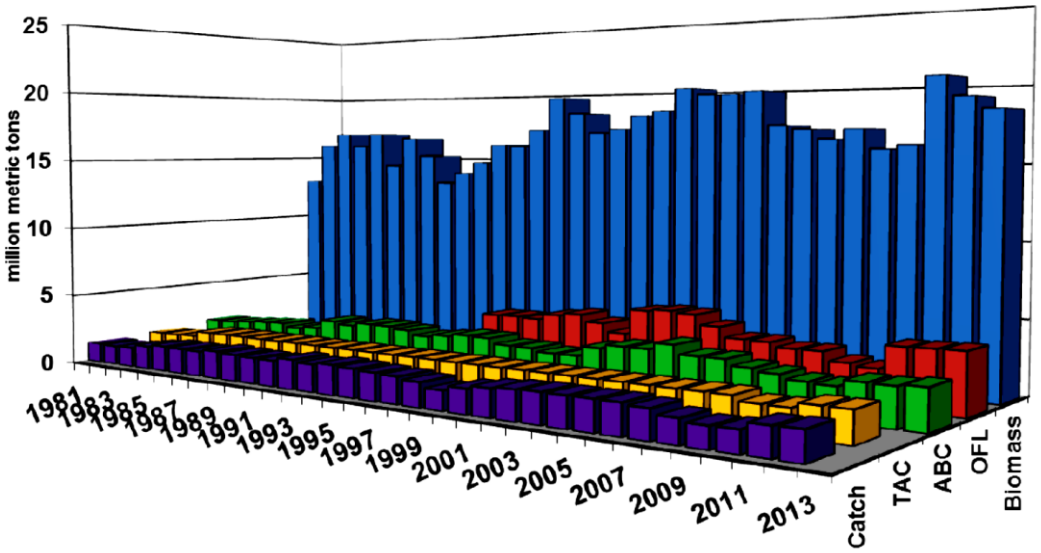


Figure 7.1. Cumulative estimates of biomass, OFL, ABC, TAC, and annual catch (all in million tons) across all groundfish species in the BSAI, 1981-2013. http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIintro.pdf

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf

The harvest control rule is intended to account for scientific uncertainty in two ways: First, the control rule is structured explicitly in terms of the type of information available, which is related qualitatively to the amount of scientific uncertainty. Second, the size of the buffer between *maxFABC* in the Tier of the ABC control rule and *FOFL* in the Tier of the OFL control rule varies directly with the amount of scientific uncertainty. For the information levels associated with the remaining tiers, relating the buffer between *maxFABC* and *FOFL* to the amount of scientific uncertainty is more difficult because the amount of scientific uncertainty is harder to quantify, so buffers of fixed size are used instead.

Bycatch Limits

Bycatch from a given stock is limited by a Maximum Retainable Bycatch amount (MRB), which is determined as a percentage of retained catch (not including arrowtooth flounder). In practice, NMFS attempts to manage a fishery so that total catch (including all discards) is less than, but very close to the TAC. Ideally, the directed fisheries are closed well before TAC is reached, so that when bycatch numbers for that stock in other fisheries are factored in, the annual total catch is less than but very close to TAC. When a directed fishery is closed, bycatch of that stock is limited by an MRB amount. If it appears that the TAC may be exceeded due to unanticipated circumstances, and ABC is

being approached, NMFS managers will prohibit retention of that species by all fisheries, in order to eliminate any 'top off' activity for bycatch of valuable species. If ABC is exceeded, and OFL is being approached, NMFS can prohibit or close any fisheries that might possibly take that species as bycatch.

The Council determines the TAC based on social and economic considerations. In application, the NPFMC sets TAC ≤ ABC < OFL. Actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC (Figure 7.1). The four main reasons that TAC may be set lower than ABC are: (1) to remain under the 2 million mt OY limit; (2) to increase a rebuilding rate or address other conservation issues; (3) to limit incidental bycatch, for example of halibut; or (4) to account for state water removals. Fisheries are managed in-season to achieve the TACs without exceeding the ABC or OFL.

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

Evidence:
ADFG Sablefish management
http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management
http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/Groundfish-2012-2013.pdf

DiCosimo, J., Methot, R. D., and Ormseth, O. A. 2010. Use of annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific). – ICES Journal of Marine Science, 67: 1861–1865.
http://icesjms.oxfordjournals.org/content/67/9/1861.full

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. . (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

North Pacific Fishery Management Council
http://www.fakr.noaa.gov/npfmc/

D. Management Measures

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

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

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Rating Determination

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

Derivation and management of catch limits

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

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

individual fish will reproduce at least once. Spawning potential of sablefish, expressed as spawning biomass per recruit, increased nine percent for the IFQ fishery.

The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify Annual Catch Limits (ACLs) with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)) and to subsequently account for whatever catches, bycatch or discards previously unaccounted. Please also refer to the Tier and harvest control system as explained in Clause 7.

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

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

In 2013, a restructured Observer Program expanded coverage to vessels < 60 ft LOA and implemented a more flexible system. The new Program will provide better by-catch data for future stock assessments. See clause 4 for a detailed description of the new program.

Closures and seasons

The Federal FMP for the BSAI and GOA list the fishery closures that are in place throughout Alaska. These closures apply to different vessels and gear types. For example, there are closures to all vessels (i.e. fishing or anchoring within the Sitka Pinnacles Marine Reserve is prohibited at all times); use of trawl gear prohibited at all times in the Southeast Outside district, year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area, the Nearshore Bristol Bay Trawl Closure area is also closed year-round except for a subarea that remains open between April 1 and June 15 each year. The Chum Salmon Savings Area is closed to trawling from August 1 through

August 31. Closures also apply to non-pelagic trawl (i.e. the use of non-pelagic trawl is prohibited in Cook Inlet) Also, three types of closure areas are designated around Kodiak Island. Type I areas prohibit non-pelagic trawling year-round; Type II prohibit non-pelagic trawl from February 15 to June 15; adjacent areas designated as Type III may be reclassified by the Regional Administrator as Type I or Type II following a recruitment event. The Gulf of Alaska Slope Habitat Conservation Area is closed to non-pelagic trawling year-round. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round and in the Aleutian Islands Coral Habitat Protection Areas year-round. The use of mobile bottom contact gear is prohibited year-round in Bowers Ridge Habitat Conservation Zone. Juvenile sablefish, mainly found close to the shore, tends to segregate spatially from adult sablefish, which is found in deeper waters. Within the time allowed by IFQ management, fishermen are able to target and catch adult sablefish with a high degree of precision.

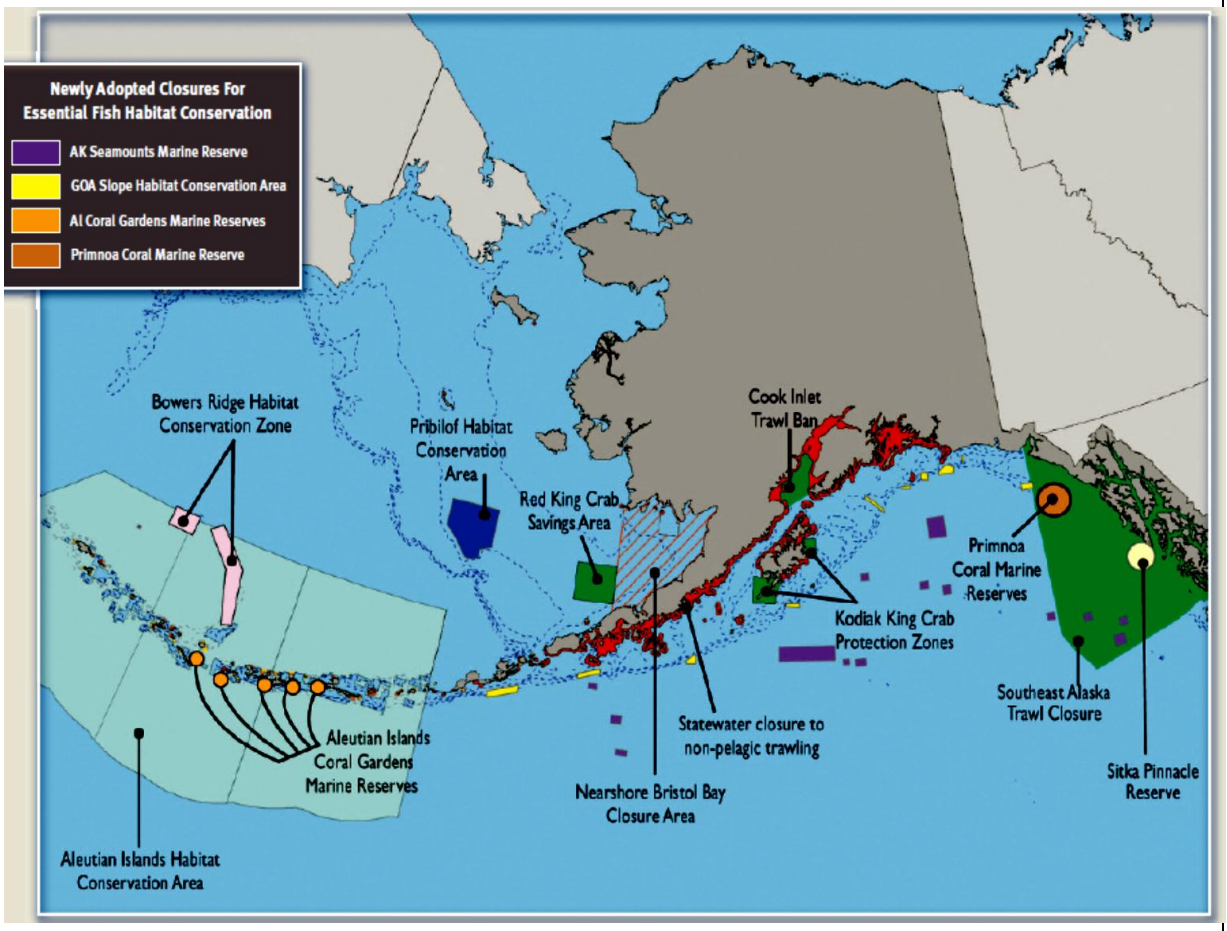


Figure 8.1. Year round closures in Alaskan waters.
https://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf

Area allocation of harvests

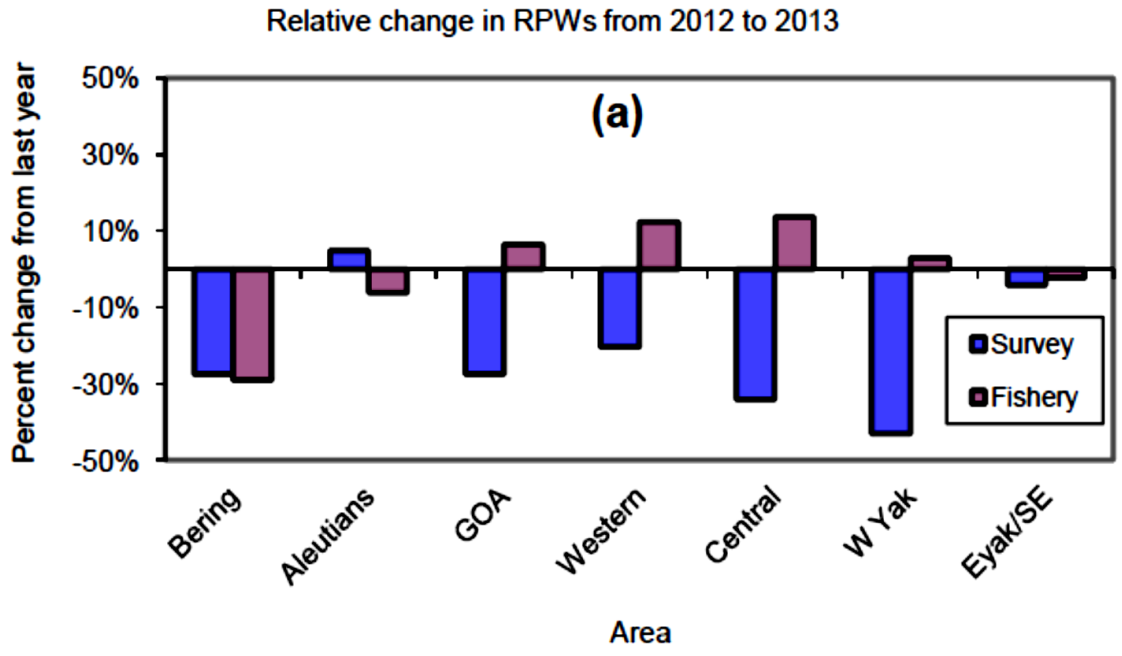
Apportionment of catch depending on survey abundance indexes is intended to avoid localized depletions of sablefish throughout Alaska. See Table 8.1. Below for the latest apportionments. The combined ABC has been apportioned to regions using weighted moving average methods since 1993. These methods reduce the magnitude of inter-annual changes in the apportionment while adapting to current information about the biomass distribution.

Starting with the 2000 ABC, the Council approved an apportionment based on survey and fishery data. Stock assessment scientists continue to use survey and fishery data to apportion the 2013 ABC. These data were combined by computing a weighted average of the survey and fishery estimates, with the weight inversely proportional to the variability of each data source. The variance for the fishery data has typically been twice that of the survey data, so the survey data was weighted twice as much as the fishery data. Recent improvements in sample size of observer and logbook collections have reduced the variance on the fishery sources.

Table 8.1. ABC apportionment among federal regions based on relative population weight (ROW) measured in survey and fishery data. (NOAA / NMFS, December 2012).

Apportionments are based on survey and fishery information	2012 ABC Percent	2012 Survey RPW	2011 Fishery RPW	2013 ABC Percent	2012 ABC	2013 ABC	Change
Total					17,240	**16,230**	-6%
Bering Sea	13%	5%	9%	10%	2,230	**1,580**	-29%
Aleutians	12%	15%	13%	13%	2,050	**2,140**	4%
Gulf of Alaska	75%	79%	78%	77%	12,960	**12,510**	-4%
Western	14%	15%	13%	14%	1,780	**1,750**	-1%
Central	44%	46%	40%	44%	5,760	**5,540**	-4%
W. Yakutat*	16%	12%	17%	15%	2,080	**1,860**	-11%
E. Yakutat / Southeast*	26%	27%	30%	27%	3,350	**3,360**	0%

The 2013 apportionment reflects a substantial decrease in the longline survey index in all areas except the AI. The BS fishery relative population weight (ROW) decreased substantially, while all other areas remained steady or increased. The BS saw the largest change in apportionment, with the BS ABC declining another 29% as high years dropped out of the moving average and more recent fishery indices become more strongly weighted indices. Thus, the GOA continues to gain a larger share of the apportionment. See Table 8.1.



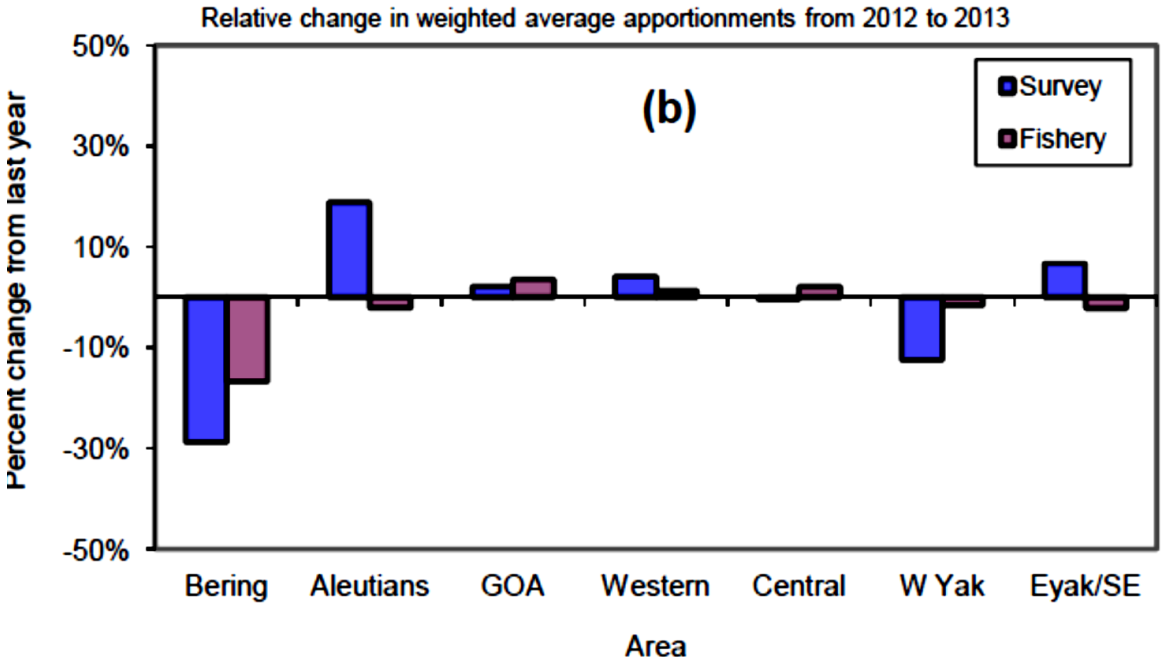


Figure 8.2. Top figure shows percent changes in relative population weight (PROW) for sablefish across federal management units based on fishery and survey data from 2012 to 2013. The bottom figure shows corresponding changes to apportionments.
(NOAA / AFSC, December 2012)

State waters: apportionment and seasons

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

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

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

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

Northern Southeast Inside (NSEI) subdistrict
The 2013 NSEI subdistrict commercial sablefish fishery annual harvest objective (AHO) is 1,002,162 round pounds. There are 78 valid Commercial Fisheries Entry Commission (CFEC) permits for 2013, one less than in 2012; therefore the individual equal quota share (EQS) is 12,848 round pounds (a 4% increase from the 2012 EQS of 12,342 round pounds). The AHO is based on the sablefish acceptable biological catch (ABC) with decrements made for sablefish mortality in other fisheries. The fishery opens by regulation at 8:00 a.m., August 15, 2013 and will close at 12:00 noon November 15, 2013. Permit holders should have received a letter detailing any legal overage or underage incurred during the 2012 fishing season; 2013 personal quota shares (PQS) will be adjusted based on this amount.

Prince William Sound
The 2013 PWS sablefish season opened on April 15th with a 242,000 lb guideline harvest level (GHL). Fishing season dates are April 15 - August 31. The fishery is managed via quota allocations among vessel size permit classes as specified in regulation 5 AAC 28.272.
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/255897087.pdf

Cook Inlet
The Cook Inlet Area sablefish season opened at 12:00 noon July 15 with a 66,000 pound guideline harvest level (GHL). A season closure will be announced when harvest projections indicate achievement of the GHL. Harvest will be monitored via fish tickets and contacts with buyers and fishermen. A vessel may not land or have on board more than 3,000 pounds of sablefish (round weight) in any two consecutive day period. All state-waters sablefish harvest must be landed within 24 hours of the closure (5 AAC 28.371).
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/302769255.pdf

Aleutian Islands
State waters of the Aleutian Islands opened to commercial fishing for sablefish beginning noon, May 15, 2013. The guideline harvest level (GHL) for the 2013 Aleutian Islands state-waters sablefish fishery is 442,000 pounds. The state-waters sablefish fishery will close when the guideline harvest level is achieved, or on November 15, 2013.
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/255960594.pdf

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

reason, e.g. fish are small, PQS has been met [5 AAC 28.170(f)].

Fishing gear

Sablefish are caught primarily with longline gear in Alaska. Pot fishing occurs in the BSAI but not currently in the GOA. In federal waters, sablefish are primarily caught in directed fisheries on longline gear; however, an increasing trend toward pot gear exists due to whale depredation of sablefish on longline gear. In addition, sablefish are caught as bycatch in trawl fisheries.

Fixed gear (longlines and pots) harvests approximately 85% of the sablefish quota and trawl gear approximately 15%. Pot fishing in the BSAI accounts for nearly half of the Individual Fishing Quota (IFQ) catch in those areas.
(http://www.afsc.noaa.gov/ABL/MESA/ mesa_sa_sable_fi.htm).

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

Pot gear

Pot fishing for sablefish has increased in the Bering Sea and Aleutian Islands as a response to depredation of longline catches by killer whales. In 2000 the pot fishery accounted for less than ten percent of the fixed gear sablefish catch in the Bering Sea and Aleutian Islands. Since 2004, pot gear has accounted for over half of the Bering Sea fixed gear IFQ catch and up to 34% of the catch in the Aleutians. In 2013, the NPFMC is considering allowing the use of pot gear in the Gulf of Alaska.

Federal regulations define pot gear for all groundfish (i.e., there is no distinction between pot gear for different species, e.g., Pacific cod or sablefish). Pot gear means a portable structure designed and constructed to capture and retain fish alive in the water. This gear type includes longline pot and pot-and-line gear. Each groundfish pot must comply with the following:
(i) Biodegradable panel. Each pot used to fish for groundfish must be equipped with a biodegradable panel at least 18 inches (45.72 cm) in length that is parallel to, and within 6 inches (15.24 cm) of, the bottom of the pot, and that is sewn up with untreated cotton thread of no larger size than No. 30.

(ii) Tunnel opening. Each pot used to fish for groundfish must be equipped with rigid tunnel openings that are no wider than 9 inches (22.86 cm) and no higher than 9 inches (22.86 cm), or soft tunnel openings with dimensions that are no wider than 9 inches (22.86 cm).

The Alaska Administrative Code 5 AAC 39.145, as well as federal regulations under 50 CFR 679.2 state that pot gear in Alaska crab and bottom fish fisheries is required to have an escape mechanism consisting of an opening closed by 100% cotton twine no larger than 30-thread.

In 2012, the NPFMC approved the formation of a gear committee to look at the pot gear issue and prepare a discussion paper to address conservation benefits and gear configurations and soak times. In May 2013, the NPFMC received the discussion paper to Allow the Use of Pot Gear for Sablefish in the Gulf of Alaska.

Longline gear

Longline gear and the manner of fishing have been developed over a long period of time to be selective of target species. As an example, specific regulations were put in place intended to reduce the incidental mortality of the short-tailed albatross and other seabird species with revision in 1996 and 2001. The short-tailed albatross is a listed species under the Endangered Species Act (ESA). The BOF enacted changes to state law, mirroring federal regulations within state waters for groundfish fisheries. These measures now include the use of streamer (tory) lines, night setting, line shooter and lining tubes, and have been shown to reduce seabird interactions when setting or retrieving gear. The 1996 regulation imposing paired streamer lines and integrated weighted groundlines were nearly 100% effective at eliminating the catch of albatrosses and other surface feeding birds, resulting in an eight-fold decrease in seabird mortality. The current catch of seabirds in the sablefish fishery averages 17% of the total bycatch. The trend in seabird catch is variable but appears to be decreasing further, presumably due to widespread use of these measures to reduce bycatch.

Under the Individual Quota Fishery system in Alaska's federal fisheries and the equal quota share in the major state waters fisheries, much less gear is used and consequently lost than in the historical race for fish scenario. Market forces ensure that gear is cost effective.

Trawl gear

The bottom trawl gear in the BSAI has been modified according to regulation to have elevating devices (bobbins) (also note near implementation in the GOA) which has been shown to reduce the impact on both the seafloor (up to 90%) and the associated non-target invertebrates (e.g. king crabs).

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

Evidence:

DiCosimo, J., Methot, R. D., and Ormseth, O. A. 2010. Use of annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific). Use of

annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific). – ICES Journal of Marine Science, 67: 1861–1865.
http://icesjms.oxfordjournals.org/content/67/9/1861.full.pdf?keytype=ref&ijkey=Rr1hA2GwWtqE2TZ

NOAA/NMFS Alaska Regional Office. Individual Fishing Quota Program
http://www.fakr.noaa.gov/ram/ifq.htm

NOAA/ Resource Ecology and Fisheries Management (REFM) Division
http://www.afsc.noaa.gov/REFM/

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

NOAA/AFSC, 2012. Ecosystem Considerations. 2012.
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

NOAA/NMFS Alaska Regional Office
http://www.alaskafisheries.noaa.gov/

NPFMC, 2013. DISCUSSION PAPER. ALLOW THE USE OF POT GEAR FOR SABLEFISH IFQS IN THE GULF OF ALASKA. May 30, 2013. AGENDA D-1(b) Supplemental JUNE 2013.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/D1bSupplemental.pdf

Southeast Alaska Fishermen's Alliance
http://www.seafa.org/

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

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Projected 2013 spawning biomass of sablefish is 37% of the unfished spawning biomass. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC≤ABC<OFL. The harvest control rule is designed to ensure the population is capable of producing MSY.

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

Model projections indicate that the sablefish stock in Alaska is neither overfished nor approaching an overfished condition. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Projected 2013 spawning biomass of sablefish is 37% of the unfished spawning biomass. Stock assessors estimated the posterior probability that projected abundance will fall, or stay below thresholds of 17.5% (MSST), and 35% (MSY), and 40% (*Btarget*) of the unfished spawning biomass based on the posterior probability estimates. For management, it is important to know the risk of falling under these thresholds. The probability that spawning biomass falls below key biological reference points was estimated based on the posterior probability distribution for spawning biomass. The probability that next year's spawning biomass was below *B35%* was 0.17. During the next three years, the probability of falling below B17.5% is near zero, the probability of falling below B35% is 0.7 (up from 0.6 last year), and the probability of staying below B40% is near 100%. In NPFMC settings, thresholds are defined in the Council harvest rules. These are when the spawning biomass falls below MSY or $B_{35\%}$ and when the spawning biomass falls below ½ MSY or $B_{17.5\%}$ which calls for a rebuilding plan under the MSA.

The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. The rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. The management system for the NPFMC groundfish fisheries is a complex suite of measures comprised of harvest controls—e.g., OY, ACL, ABC, TAC, OFL—effort controls (IFQs, licenses, cooperatives), time and/or area closures (i.e. gear closures, habitat protection measures, marine reserves), bycatch controls (Maximum Retainable Bycatch (MRB) amounts, PSC limits, retention and utilization requirements), monitoring and enforcement (observer program), social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions and to avoid seabirds bycatch).

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

Year	2012				2013		2014	
Region	OFL	ABC	TAC	Catch*	OFL	ABC	OFL	ABC
BS	2,640	2,230	2,230	559	1,870	1,580	1,755	1,482
AI	2,430	2,050	2,050	884	2,530	2,140	2,374	2,007
GOA	15,330	12,960	12,960	10,434	14,780	12,510	13,871	11,731
W	--	1,780	1,780	1,179	--	1,750	--	1,641
C	--	5,760	5,760	4,651	--	5,540	--	5,195
WYAK	--	2,247	2,247	1,890	--	2,030	--	1,902
SEO	--	3,173	3,173	2,715	--	3,190	--	2,993
Total	20,400	17,240	17,240	11,877	19,180	16,230	18,000	15,220

*Current as of September 29, 2012 Alaska Fisheries Information Network, (www.akfin.org).

Table 9.1. OFL, ABC and TAC for the sablefish fishery in 2012 and 2013. (NOAA / AFSC, December 2012).

Under the individual fishing quota share system in place for the sablefish fishery, fishing capacity (vessels and gear) has been reduced. Through a public process at the NPFMC, extensive staff analysis was presented, analyzed, and data confirmed to ensure that the proposed level of fishing was commensurate with the sustainable use of the fishery resource. The number of vessels, and the class of those vessels, established qualifications for a fishing fleet with less capacity and with ownership in the resource.

With the implementation of IFQs in the fishery off Alaska, the derby type fishery was eliminated. Seasons were extended and wastage was reduced in the sablefish fishery. In the mid-1980s industry made the operational switch from J-hooks to circle hooks in the commercial fishery, lowering the mortality of bycaught sablefish caught and released during commercial fishing (in both IFQ fisheries). http://www.fakr.noaa.gov/regs/679d42.pdf

Evidence

DiCosimo, J., Methot, R. D., and Ormseth, O. A. 2010. Use of annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific). Use of

annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific). –
ICES Journal of Marine Science, 67: 1861–1865.
http://icesjms.oxfordjournals.org/content/67/9/1861.full.pdf?keytype=ref&ijkey=Rr1hA2GwWtqE2TZ

NOAA Resource Ecology and Fisheries Management (REFM) Division
http://www.afsc.noaa.gov/REFM/

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

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

FAO CCRF 8.1.7/8.1.10/8.2.4/8.4.5

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

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

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

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

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

The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's continually evolving maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals.

The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit (AYFS). Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation, to seafood markets & marketing. The target audience for these Summits is young Alaskans from

coastal communities.

The 2013 summit will be hosted in Anchorage, Alaska, from December 10th to the 12th. The summit provides three days of training in the land-based aspects of running a fishing operation: marketing, business management, the fisheries regulatory process, and the science impacting fisheries management, a visit to the Anchorage office of the Alaska Department of Fish & Game, where participants will talk with fisheries managers and meet researchers using cutting-edge genetic science to better understand Alaska salmon runs and other important stocks.

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

http://www.avtec.edu/AMTC.htm
http://www.stcw.org/http://seagrant.uaf.edu/map/
http://seagrant.uaf.edu/map/fishbiz/index.php
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
Alaska Marine Safety Education Association: http://www.amsea.org/

E. Implementation, Monitoring and Control

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

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

FAO Eco 29.5

Evidence adequacy rating:

☑ High ☐ Medium ☐ Low

Rating Determination

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

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

Table 11.1. At-sea IFQ violations in Alaskan waters, 2005-2011.

Violation Type	2011 Violations (23 on 13 vessels)	2010 Violations (21 on 17 vessels)	2009 Violations (10 on 10 vessels)	2008 Violations (5 on 5 vessels)	2007 Violations (20 on 19 vessels)	2006 Violations (20 on 19 vessels)	2005 Violations (10 on 8 vessels)
Fishing in Closed Area	1	1	2	0	0	0	0
FFP/IFQ Permit/Cardholder not onboard	7	1	1	0	2	4	5
Expired FFP	0	0	1	0	0	0	0
Boarding Ladder	0	0	1	0	0	0	0
Insufficient seabird avoidance	0	0	0	0	2	7	3
Logbook Discrepancy	8	7	5	3	5	5	2

Table 11.1 displays specific at-sea IFQ violations from 2005 through 2011. These selected violations are those that have persisted over time. Other violations are not included because they are occasional or minor administrative discrepancies. During 2011, of 211 boardings at sea, USCG personnel cited 13 vessels for 23 violations. The seven significant commercial IFQ violations in 2011 were for fishing without an IFQ permit, fishing inside a Stellar Sea Lion rookery, failing to carefully

release discarded halibut, fishing with insufficient observer coverage (2 vessels), discarding incidentally caught Pacific Cod, and fishing without the Vessel Monitoring System on.

Figure 11.1 shows 2012 IFQ enforcement actions, but is a combination of Alaskan Pacific halibut and sablefish IFQ fisheries.

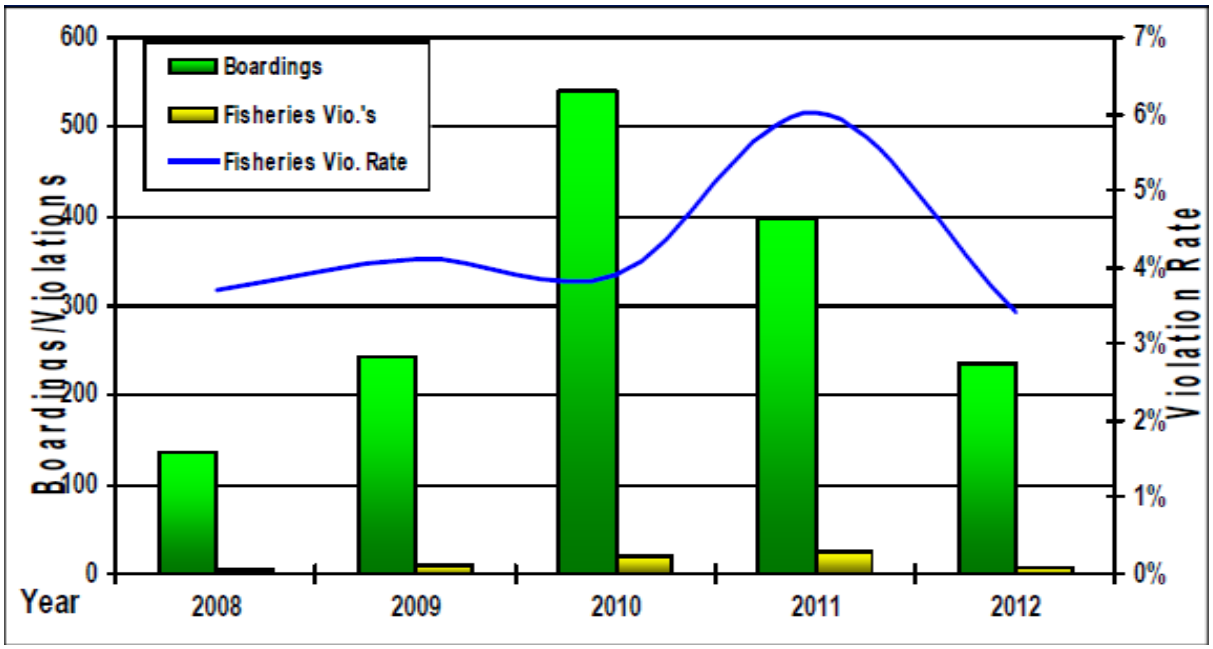


Figure 11.1. Number of IFQ fisheries boardings and violation rates for 2008-2012. From the USCG.

NMFS OLE

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

OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). GCEL can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPs) or Notice of Violation and Assessment (NOVAs), or they can refer the case to the U.S. Attorney's Office for criminal proceedings. For perpetual violators or those whose actions have severe impacts upon the resource criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the United States Attorney's Office. All landings of sablefish must be reported to NMFS via its mandatory "e-landings" reporting system. Registered Buyers must report IFQ landings electronically using the

Internet (with permission, a backup paper submission system is available for contingencies such as system outages). Real-time accounting of individual harvests contributes significantly to accurate and timely management of each IFQ holder's IFQ accounts and supports inseason transfers. Of two Internet systems available, the more comprehensive one, the Interagency Electronic Reporting System (IERS) and its data-entry component, *e*Landings, is the standard reporting method.

In 2011 Registered Buyers reported 6,907 landings: 6,650 vessel landings through IERS, 78 through the NMFS Web, and 15 manually in a nearly complete transition toward IERS. RAM could not categorize 164 landings by reporting method. Although reporting methods have changed significantly, some users will continue to depend on both manual and NMFS Web reporting.
http://alaskafisheries.noaa.gov/ram/ifq/rtf11.pdf

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

OLE Alaska Division Priorities for 2013

Magnuson-Stevens Act

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

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

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

Endangered Species Act and Marine Mammal Protection Act

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

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

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

International/Lacey Act

High Priority

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

Medium Priority

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

Low Priority

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

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

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

50CFR679: www.fakr.noaa.gov/regs/default.htm
NMFS OLE: http://www.nmfs.noaa.gov/ole/index.html
USCG, Alaska region: www.uscg.mil/d17/
IFQ: www.fakr.noaa.gov/ram/ifq.htm
reporting: www.fakr.noaa.gov/ram/webapps.htm
e-landings: http://elandings.alaska.gov/
http://www.gc.noaa.gov/enforce-office3.html
http://deckboss-thebrig.blogspot.com

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

FAO CCRF 7.7.2/8.2.7

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

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

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

(1) Issuance of a citation (a type of warning), usually at the scene of the offense (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 Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the Magnuson-Stevens Act treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

Magnuson Stevens Act Penalty Matrix.

Magnuson-Stevens Penalty Matrix

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

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

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

The "Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions" issued by NOAA Office of the General Counsel – Enforcement and Litigation - March 16, 2011, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The purpose of this Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources. Under this Policy, NOAA expects to improve consistency at a national level, provide greater predictability for the regulated community and the public, improve transparency in enforcement, and more effectively protect natural resources.
For significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's office for criminal prosecution.
http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf

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

AS 16.05.165. Form and issuance of citations
AS 16.05.170 Power to execute warrant
AS 16.05.180 Power to search without warrant
AS 16.05.190 Seizure and disposition of equipment
AS 16.05.195 Forfeiture of equipment
AS 16.05.332 Wildlife Violator Compact
AS.16.05.410 Revocation of license
AS 16.05.710 Suspension of Commercial License and Entry Permit

AS 16.05.722 Strict liability commercial fishing penalties
AS 16.05.723 Misdemeanor commercial fishing penalties
AS 16.05.896 Penalty for causing material damage
AS 16.05.901 Penalty for violations of AS 16.05.871 – AS 16.05.896.
AS 16.05.030 Penalty for violation of 16.10.010-16.10.050
AS 16.10.090 Penalty for violation of AS 16.10.090
AS 16.10.220 Penalty for violation of AS 16.10-200-16.1-.210
AS 16.10.790 Fines
AS 16.40.290 Penalty
AS 16.43.960 Commission revocation or suspension of permits
AS 16.43.970 Penalties

sources of evidence –

Alaska Statutes Title 16 (laws)

Alaska Administrative Code Title 5 (regulations)

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

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

50CFR600.740 Enforcement policy
http://www.nmfs.noaa.gov/ole/index.html
http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf
http://dps.alaska.gov/awt/

F. Serious Impacts of the Fishery on the Ecosystem

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

FAO CCRF 7.2.3/8.4.7/8.4.8/12.11

Eco 29.3/31

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

The NPFMC and NOAA/NMFS conduct assessments and research related to fishery impacts ecosystems and habitats and how environmental factors affect the fishery. Findings and conclusions are published in the Ecosystem section of the SAFE document, annual Ecosystem Considerations documents, and the various other research reports. The Essential Fish Habitat Environmental Impact Statement (EFH EIS) (NMFS, 2005) concluded that the benthic longline and pot fisheries have minimal or temporary impacts on sablefish habitat. Various studies have applied ecosystem models to food webs and impacts of climate change. Sablefish have low discard rates in other fisheries. The directed sablefish fishery takes significant amounts of grenadiers, arrowtooth flounder, spiny dogfish, sharks and some rockfish; but the fishery does not pose a threat to bycatch species. Management measures limit interactions with seabirds and the fishery has minimal impact on the short-tailed albatross, the only seabird listed as endangered under the ESA. Interactions with whales remain a problem as they take fish off longline gear, but the fishery does not adversely affect whale populations. The 2012 sablefish assessment presents research recommendations including those to better understand environmental variables on recruitment processes.

Research and institutional capacity

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

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

Ecosystem considerations

Table 13.1. Summarizes ecosystem considerations for the sablefish fisheries

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

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

Fishery interactions with the ecosystem

Little is known about effects of fishing on benthic habitat or the habitat requirements for growth to maturity. 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. 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.
http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIsablefish.pdf

However, 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).

NMFS, 2005. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska.
http://www.fakr.noaa.gov/habitat/seis/efheis.htm.

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

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

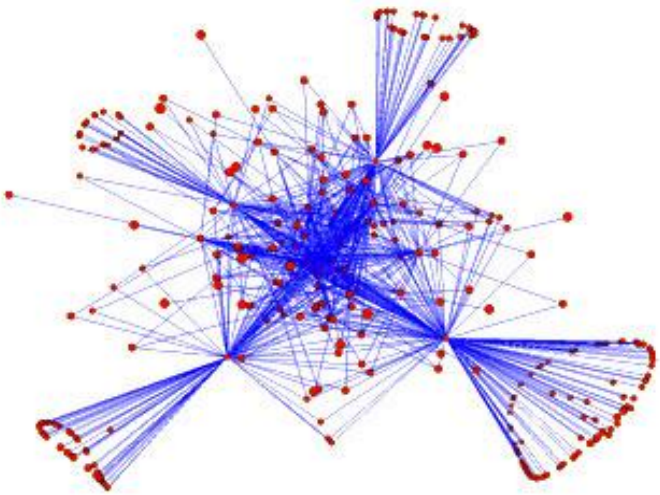


Figure 13.1. Food web constructed from the GOA food habits database, where each species is a node (dots) and each predator-prey interaction is a link (lines). The four "hubs" apparent in the figure are cod, pollock, halibut, and arrowtooth flounder. (NOAA / AFSC, 2006).

Discards

Sablefish discard data by target fisheries are available for hook-and-line and other gear. From 1994 to 2004 discards averaged 1,357 t for the GOA and BSAI combined. Since then, discards have been lower, averaging 626 t between 2006 and 2011. The highest discard amounts occur in hook-and-line fisheries in the GOA (Table 13.2).

Table 13.2. Discarded catches of sablefish (amount [t], present of total catch, total catch [t]) by gear (H&L=hook & line, Other=pot, trawl, and jig, combined for confidentiality) by FMP area for 2006-2011. Source: NMFS Alaska Regional Office via AKFIN, October 12, 2012.

		BSAI			GOA			Combined		
YEAR	Gear	Discard	%Discard	Catch	Discard	%Discard	Catch	Discard	%Discard	Catch
2006	Total	62	2.87%	2,168	556	4.22%	13,171	618	4.03%	15,339
	H&L	46	4.68%	982	286	2.37%	12,073	332	2.55%	13,055
	Other	16	1.38%	1,186	269	24.55%	1,098	286	12.51%	2,284
2007	Total	70	3.01%	2,322	419	3.30%	12,692	489	3.26%	15,014
	H&L	16	2.32%	679	242	2.09%	11,586	258	2.10%	12,265
	Other	54	3.29%	1,643	177	16.00%	1,106	231	8.40%	2,748
2008	Total	98	4.83%	2,035	810	6.43%	12,591	908	6.21%	14,626
	H&L	92	10.86%	845	737	6.29%	11,727	829	6.60%	12,573
	Other	7	0.55%	1,190	72	8.36%	864	79	3.83%	2,053
2009	Total	26	1.28%	1,986	709	6.45%	10,997	734	5.66%	12,983
	H&L	18	1.49%	1,183	628	6.21%	10,108	646	5.72%	11,291
	Other	8	0.98%	803	81	9.10%	889	89	5.25%	1,692
2010	Total	41	2.26%	1,830	415	4.12%	10,086	457	3.83%	11,916
	H&L	34	2.81%	1,215	368	4.01%	9,186	402	3.87%	10,401
	Other	7	1.19%	615	47	5.26%	900	55	3.61%	1,515
2011	Total	24	1.40%	1,714	529	4.74%	11,148	553	4.30%	12,863
	H&L	16	1.52%	1,077	350	3.48%	10,058	367	3.29%	11,136
	Other	41	6.44%	637	178	16.36%	1,090	186	10.77%	1,727
2006-2011 Average	Total	54	2.67%	2,009	573	4.86%	11,781	626	4.54%	13,790
	H&L	37	3.70%	997	435	4.03%	10,790	472	4.01%	11,787
	Other	22	2.19%	1,012	138	13.88%	991	154	7.70%	2,003

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

Table 13.3. Discards and discard rates for groundfish catch off Alaska by area, gear and species 2007-2011 (1,000 metric tons, round weight).

		Fixed		Trawl		All gear	
	Year	Total Discards	Discard Rate	Total Discards	Discard Rate	Total Discards	Discard Rate
Sablefish	2007	0.2	2 %	0.2	16 %	0.4	3 %
	2008	0.7	6 %	0.1	8 %	0.8	6 %
	2009	0.8	8 %	0.1	9 %	0.9	8 %
	2010	0.4	4 %	0	5 %	0.4	4 %
	2011	0.4	4 %	0.2	16 %	0.5	5 %

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

Bycatch

Table 13.4 shows the bycatch of species with GOA and BSAI Fishery Management Plans (FMPs) caught in the sablefish target fishery. The largest bycatch is arrowtooth flounder (534 t/year, 456 t discarded). Shortspine thornyhead and shortraker rockfish are the 2nd and 3rd most caught species at 366 t/year and 207 t/year. The next three groups are “Other Species”, GOA “Other Skate”, and

GOA longnose skate which total 415 t/year.

Table 13.4. Bycatch (t) of FMP groundfish species in the targeted sablefish fishery averaged from 2007-2011. Other=pot and trawl combined because of confidentiality. Other species is 2007-2010, and sharks are only 2011.

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

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

Non-target, Non-FMP bycatch

Giant grenadiers, a non-target species that is not in either FMP, make up the bulk of the nontarget species bycatch, peaking at 9,315 t in 2007, but decreasing since then with a 2011 catch of 6,652 t (Table 13.5). Other non-target catches that have totals over a ton per year are corals, snails, sponges, sea stars, and miscellaneous fishes and crabs.

Table 13.5. Bycatch of nontarget species and HAPC biota in the targeted sablefish fishery.

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

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

Prohibited species catches (PSC)

Halibut dominate the protected species catch in the targeted sablefish fisheries averaging 1,060 tons / year). Other PSC species include 134,000 golden king crab individuals per year and other crab species. Halibut catches seem to be decreasing, while catches of golden king crab are highly variable from year to year, probably as a result of low sampling effort in BSAI sablefish pot fisheries (Table 13.6).

Table 13.6. Prohibited Species Catch (PSC) estimates reported in tons for halibut and herring, thousands of animals for crab and salmon, by year, and fisheries management plan (BSAI or GOA) area for the sablefish fishery. Other = Pot and trawl combined because of confidentiality.

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

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

Bycatch in state waters

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

Table 13.7. Allowable bycatch that may be landed on a NSEI sablefish permit.

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

Bycatch limits are based on the round weight of the bycatch species to the round weight of the target species, (i.e. sablefish).
Full retention of all rockfish is required excluding thornyheads.

ADFG News Release. 25 June 2013
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/293718980.pdf; and
ADFG. March 2013
http://www.adfg.alaska.gov/FedAidPDFs/FMR13-08.pdf)

Grenadier interactions and management options

Giant grenadiers, make up the bulk of the nontarget species bycatch, peaking at 9,315 t in 2007, but decreasing since with a 2011 bycatch of 6,652 t. Their catch averages 66% of the total bycatch in the sablefish fishery. However, there is no evidence to suggest that overfishing is occurring for grenadiers in the BSAI and in the GOA because neither ABC nor OFL have been exceeded the last years.

Giant grenadier is abundant on the continental slope of Alaska and scientists consider it an extremely important component of the ecosystem in this habitat. The amount of giant grenadier taken as bycatch in this region is substantial. In the GOA in 2010, the estimated catch of giant grenadier of 5,419 tons was exceeded for only five groundfish species: walleye pollock (*Theragra chalcogramma*), Pacific cod (*Gadus macrocephalus*), arrowtooth flounder (*Atheresthes stomias*), Pacific ocean perch (*Sebastes alutus*), and sablefish. Most of the giant grenadier bycatch in the GOA is from the sablefish longline fishery, and nearly all is discarded at sea with a likely mortality rate of 100%.

Grenadiers are presently considered “non-specified” fish by the NPFMC, which means they are technically not part of the NPFMC management process and are not assigned values for overfishing levels (OFL), acceptable biological catch (ABC), or total allowable catch (TAC). Without an FMP, there are no limitations on catch or retention of grenadiers, no reporting requirements, and no official tracking of catch by management. As a non-specified species, grenadier are defined as a residual category of species of no current or foreseeable economic value or ecological importance, which are

taken in the groundfish fishery as accidental bycatch and are in no apparent danger of depletion and for which virtually no data exists (that) would allow population assessments.

However, for the last several years there have been proposals to change the management status of grenadiers. Full assessment reports were prepared for grenadiers in 2006, 2008, 2010, and November 2012. Because grenadiers are "nonspecified", all these reports are considered unofficial, and they have been included as appendices in the standard SAFE reports. In 2013, the NPFMC is examining options to modify grenadier status to be "in the fishery" or be included as an "ecosystem component." Under these categories, NMFS would be required to provide better information about the fishery. If mangers determine grenadier to be "in the fishery," they must establish annual ACLs, AMs, OFLs, ABCs, and TACs and ensure that overfishing does not occur. Alternatively, as an "ecosystem component" (EC), grenadier should be a non-targeted species that is not subject to overfishing, overfished, or approaching an overfished condition and not generally retained for sale or commercial use. Fishermen catching EC species would be required to report them for monitoring purposes and directed fishing for EC species would be prohibited.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/GrenadierDiscPaper521.pdf

Gulf of Alaska Grenadiers

	Last year[a]		This year	
Quantity/Status	2012	2013	**2013**	2014
M (natural mortality)	0.078	0.078	**0.078**	0.078
Specified/recommended Tier	5	5	**5**	5
Biomass	597,884	597,884	**597,884**	597,884
F_{OFL} (F=M)	0.078	0.078	**0.078**	0.078
$maxF_{ABC}$ (maximum allowable = 0.75*x* F_{OFL})	0.0585	0.0585	**0.0585**	0.0585
Specified/recommended F_{ABC}	0.0585	0.0585	**0.0585**	0.0585
Specified/recommended OFL (t)	46,635	46,635	**46,635**	46,635
Specified/recommended ABC (t)	34,976	34,976	**34,976**	34,976
Is the stock being subjected to overfishing?	n/a	n/a	n/a	n/a

Bering Sea and Aleutian Islands Grenadiers

	Last year[a]		This year	
Quantity/Status	2012	2013	**2013**	2014
M (natural mortality)	0.078	0.078	**0.078**	0.078
Specified/recommended Tier	5	5	**5**	5
Biomass	1,733,797	1,733,797	**1,152,284**	1,152,284
F_{OFL} (F=M)	0.078	0.078	**0.078**	0.078
$maxF_{ABC}$ (maximum allowable = 0.75*x* F_{OFL})	0.0585	0.0585	**0.0585**	0.0585
Specified/recommended F_{ABC}	0.0585	0.0585	**0.0585**	0.0585
Specified/recommended OFL (t)	135,236	135,236	**89,878**	89,878
Specified/recommended ABC (t)	101,427	101,427	**67,409**	67,409
Is the stock being subjected to overfishing?	n/a	n/a	n/a	n/a

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

Grenadier research. To investigate the abundance and distribution of giant grenadier and sablefish in waters deeper than 1,000 m in the GOA, the AFSC's Auke Bay Laboratories conducted an experimental longline survey of these depths in August 2008. The experiment covered a relatively small area over a short time; rather than being a comprehensive study, the experiment provided an indication of what the abundance of the fish may be at these depths. Results suggest that peak density for giant grenadier may be at depths < 1,000 m and sex ratios change with depth. Although

these data have little use in current stock assessment models, they provide better understanding of grenadier in the ecosystem and interactions with the sablefish population. (Clausen, D. M., and C. J. Rodgveller. 2013).

Fishery impact on the shark complex

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

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

Gulf of Alaska shark bycatch. The shark complex serves as a management unit and it includes spiny dogfish, Pacific sleeper shark, salmon shark and other/unidentified sharks) in the GOA and BSAI. Stock assessments occur on biennial schedules for each region. The most recent BSAI shark complex took place in 2012, the next GOA assessment will be in 2013. In 2011, GOA sablefish fishermen caught almost 250 tons of spiny dogfish as bycatch. On average from 1990 to 2011, the sablefish fishery caught 23% of the spiny dogfish harvest and 70 % of other/unidentified sharks. (Table 13.8 and Table 13.9). NMFS manages GOA sharks are a complex of Tier 5 (spiny dogfish) and Tier 6 (all other sharks) species. The OFL is based on the sum of the Tier 5 and Tier 6 (average historical catch between the years 1997 - 2007) recommendations for the individual species (ABC is 75% of OFL). For 2013, NMFS recommended an ABC of 6,028 t and an OFL of 8,037 t for the shark complex in the Gulf of Alaska. Catch in 2011 was 522 t and in 2012 was 452 t (as of October 1).

Table 13.8. Estimated catch (tons) of spiny dogfish in the Gulf of Alaska.

Fishery	Pollock	Pacific Cod	Flatfish	Rockfish	Halibut	Sablefish	Grand Total	Year % of Total 97-11
1990	57.6	36.0	13.5	1.8		59.0	170.9	
1991	29.3	52.6	16.2	16.4		26.2	141.2	
1992	84.4	50.5	116.0	22.4		40.7	320.6	
1993	137	10.1	138.5	2.4		95.3	383.4	
1994	22	16.9	83.4	2.5		35.4	160.2	
1995	2.8	28.1	24.1	18.4		50.7	140.6	
1996	2.9	15.3	182.6	19.8		79.5	336.9	
1997	2.8	57.6	137.2	326.2		133.7	657.5	8%
1998	4.9	727.2	69.0	3.1		59.6	864.9	10%
1999	8.6	160.2	56.6	4.8		83.4	313.6	4%
2000	18.7	29.4	66.3	146.6		136.6	397.6	5%

2001	11.6	172.8	162.5	25.1		122.1	494.0	6%
2002	-	-	-	-	-	-	-	
2003	6.1	43.6	166.0	35.5	6.6	17.3	275.0	3%
2004	9.2	19.6	15.5	2.3	13.4	123.2	183.2	2%
2005	15.2	27.9	50.1	2.8	17.3	329.3	442.7	6%
2006	50.0	113.2	122.9	2.0	713.2	147.4	1,148.6	14%
2007	47.6	250.2	151.4	6.2	210.5	165.6	831.4	10%
2008	59.6	289.6	87.3	4.8	0.5	91.1	533.0	7%
2009	17.6	113.7	204.8	7.0	603.2	80.7	1,027.1	13%
2010	19.8	118.1	164.0	3.5	21.4	70.8	397.7	5%
2011	1.5	20.0	46.8	0.7	69.1	248.9	387.1	5%
Fishery % of Total	3%	27%	19%	7%	21%	23%		

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

Table 13.9. Estimated catch (tons) of other/unidentified sharks in the Gulf of Alaska.

Fishery	Pollock	Pacific Cod	Flatfish	Rockfish	Halibut	Sablefish	Grand Total	Year % of Total 97-10
1990	4.1	21.3	0.8	1.4		2.9	30.5	
1991	17.8	36.7	35.5	4.4		13.7	108.1	
1992	3.3	8.4	3.5	0.1		1.5	17.2	
1993	138.3	38.1	3.7	0.0		159.3	339.6	
1994	41.6	2.3	3.0	0.0		8.9	55.8	
1995	4.0	3.4	10.6	9.7		14.3	49.3	
1996	14.2	3.1	17.8	1.9		16.0	53.4	
1997	8.9	13.4	9.0	47.5		43.9	123.4	6%
1998	24.2	10.2	17.9	2.3		1,325.2	1,379.8	66%
1999	6.1	12.3	8.1	0.1		6.4	33.0	2%
2000	12.3	3.5	34.0	4.8		18.7	73.6	4%
2001	35.0	1.4	1.5	1.4		37.7	77.0	4%
2002		-	-	-		-	-	
2003	7.6	6.4	18.2	0.2	17.5	3.1	53.0	3%
2004	11.1	2.7	18.8	0.2	2.6	3.3	38.7	2%
2005	34.7	1.2	21.5	0.2	0.2	11.0	68.8	3%
2006	40.9	11.9	24.4	1.6	0.0	4.3	83.1	4%
2007	13.9	38.3	49.6	0.4	0.0	4.9	107.0	5%
2008	4.3	2.4	2.4	0.0	0.0	2.8	12.1	1%
2009	10.4	2.7	10.6	0.0	0.0	0.0	23.7	1%
2010	3.7	0.2	4.0	1.2	0.2	0.0	9.3	0%
2011	0.2	0.2	1.5	0.0	0.0	0.1	2.1	0%
Fishery % of Total	10%	5%	11%	3%	1%	70%		

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

BSAI shark bycatch. In the BSAI, the sablefish fishery catches sharks as bycatch. The measured shark complex includes spiny dogfish, sleeper shark and salmon sharks. Sablefish bycatch (by percentage of total bycatch), for these species equaled in 2012 equaled: sleeper shark (0.1%); salmon shark (0%), and spiny dogfish (0%). All 2012 estimates are below long-term averages for shark bycatch.
http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIshark.pdf

Table 13.10. Estimated catches (t) of Pacific sleeper sharks in the eastern Bering Sea and Aleutian Islands (BSAI) by target fishery. Years 1997 - 2002 from the pseudo-blend catch estimation procedure (Gaichas 2002), 2004 - 2012 are from NMFS AKRO blend-estimated annual catches, as of Oct 1, 2012. Estimated catch of Pacific sleeper shark by target fishery are not available for 2002 because the Gaichas (2002) catch estimates ended in 2001 and CAS did not begin until 2003.

Year	Atka Mackerel	Flatfish	Pacific Cod	Walleye Pollock	Rockfish	Sablefish	Turbot	Halibut	Total
1997	0.1	0.9	74.8	105.2	0.9	45.3	77	0	304.2
1998	0	0.9	146.7	74.4	0	0	113.5	0	335.5
1999	2.4	39.4	103.3	76.8	3	15.1	78.2	0	318.2
2000	0.3	42	114.7	103.8	2.7	143.7	83.2	0	490.4
2001	27.8	179.6	252.7	205.7	0	1.8	19.3	0	686.9
2002									
2003	0.7	35.7	172.6	85.0	0.5	19.4	9.7	18.6	342.1
2004	2.0	37.3	229.8	144.0	0.7	2.3	2.7	1.1	420.0
2005	0.0	7.7	191.2	127.6	0.1	3.8	2.7	0.1	333.2
2006	0.0	9.5	123.1	178.0	0.1	1.0	1.3	0.1	313.1
2007	1.1	9.1	44.3	180.2	14.5	2.4	0.5	0.0	252.1
2008	0.1	6.3	12.7	98.3	1.2	1.2	0.4	0.0	120.1
2009	0.6	8.2	11.2	24.5	0.6	1.9	0.1	0.0	47.1
2010	0.0	1.2	8.6	10.4	0.1	0.9	0.1	0.0	21.3
2011	0.0	2.4	19.2	18.1	4.8	1.6	0.0	0.5	46.6
2012	0.9	8.2	7.6	25.8	0.6	0.1	0.1	0.0	43.3
Total	35.9	388.5	1,512.4	1,457.8	29.8	240.5	388.6	20.4	4,074.0
Avg. % of Total	1%	10%	37%	36%	1%	6%	10%	1%	

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

Seabirds

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

Endangered Species Act Incidental Take Statements

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

- Four short-tailed albatross during each two-year period for the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) hook-and-line groundfish fisheries.
- Two short-tailed albatross during each two-year period for the commercial halibut longline fishery off the coast of Alaska.
- Two short-tailed albatross in trawl fisheries managed by NMFS in the BSAI and GOA during the period that the current Biological Opinion remains in effect.

If incidental take is exceeded, consultation with the USFWS must be reinitiated. In response to listing short-tailed albatross under the ESA, NMFS implemented regulations in 1996 to require use of bird avoidance (or scaring) gear on sablefish hook-and-line fishing vessels. In 2008 NMFS revised the rule with less restrictive requirements on smaller vessels between 26 to 55 feet long. Current regulations

require bird avoidance gear (or scaring line) on some vessels operating in certain areas. These measures include the use of streamer (tory) lines and buoy bags depending on area and size of the vessel. Other avoidance measures may include night setting, using a line shooter and lining tubes. These measures have been shown to reduce seabird interactions when setting or retrieving gear. The trend in seabird catch decreased significantly with the 1996 regulations and appears to be decreasing further, presumably due to widespread use of these measures to reduce bycatch.
http://alaskafisheries.noaa.gov/protectedresources/seabirds/guide.htm

Status and trends

In the groundfish longline fisheries, the 2011 seabird bycatch numbers were 30% above the 2007-2010 average of 7,249. Overall bycatch in the longline fisheries showed a marked decline beginning in 2002 due to the deployment of streamer lines as bird deterrents. Since then, annual bycatch has remained below 10,000 birds. The 2010 bycatch (3,704 birds) was the lowest estimated in this fishery overall, but the numbers increased to 8,914 in 2011, the second highest in the streamer line era. The increased numbers in 2011 are due to a doubling of the gull (*Larus spp*) numbers (1,084 to 2,206) and a 3-fold increase in Northern fulmar (*Fulmaris glacialis*) bycatch, from 1,782 to 5,848.
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

Albatross bycatch varies annually. The greatest numbers of albatross were caught in 2008. In 2011, 87.0% of albatross bycatch occurred in the GOA which accounts for only 18.5% of overall seabird bycatch. For the endangered short-tailed albatross (*Phoebastria albatrus*) since 2003, bycatch estimates were above zero only in 2010 and 2011, when two birds and one bird were incidentally hooked in each year respectively in the Bering Sea area. The estimated number of black-footed albatross indicates over a four-fold increase in bycatch, from 44 to 206. Although the black-footed albatross is not endangered (like its relative, the short-tailed albatross), it is considered a Bird of Conservation Concern by the USFWS. This designation means that without additional conservation actions, these birds of concern are likely to become candidates for listing under the ESA.

Table 13.11. Total estimated seabird bycatch in Alaskan groundfish fisheries, all gear types and FMP areas combined, 2007-2011. Note that numbers represent extrapolations from observed bycatch, not direct observations.

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

(NOAA / AFSC, 2012. Seabird Bycatch Estimates for Alaskan Groundfish Fisheries, 1993-2011).

Interactions with whales

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

Killer whale depredation and mortality

Killer whales frequently take fish directly from commercial fishing gear as it is retrieved. Interactions with commercial longline fisheries are well-documented throughout the GOA and BSAI. Depredation rates of bottom fish by killer whales on longline catches, based on four different methods of calculation, suggested that whales took 14 to 60 percent of the sablefish, 39 to 69 percent of the Greenland turbot, and 6 to 42 percent of the arrowtooth flounder caught in commercial gear (Yano and Dahlheim 1995). Depredation rates can be so high in some areas that fishermen have abandoned particular fisheries even when they are still open. Killer whales fall under the jurisdiction of the NOAA Fisheries PRD, and are protected under the Marine Mammal Protection Act (MMPA) of 1972. In addition, there are many reports of killer whales consuming the processing waste of Bering Sea groundfish trawl fishing vessels.

Data gaps and research priorities

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

1) Refine survey abundance index model for inclusion in the 2012 assessment model that accounts for whale depredation and potentially includes gully abundance data and other covariates.

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

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

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

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

6) Develop a spatially explicit research assessment model that includes movement, which will help in examining smaller-scale population dynamics while retaining a single stock hypothesis Alaska-wide sablefish model.

7) Improve knowledge of maturity and fecundity. In 2011, the AFSC conducted a winter cruise out of Kodiak to sample sablefish when they are preparing to spawn. Ovaries will be examined histologically to determine maturity for a study of the age at maturity and fecundity. Results are expected in 2013.
http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIsablefish.pdf

Evidence:
ADFG, 25 June 2013. News release.
http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/293718980.pdf

ADFG, March 2013. Southeast Alaska Northern Southeast Inside Sablefish Fishery Information Report with an Outook for the 2012. Fishery Management Report No. 13-08.
http://www.adfg.alaska.gov/FedAidPDFs/FMR13-08.pdf

Allen, B. M., and R. P. Angliss. 2013. Alaska marine mammal stock assessments, 2012. NOAA Tech. Memo. NMFSAFSC- 245, 282 p.
http://www.nmfs.noaa.gov/pr/sars/region.htm
http://www.nmfs.noaa.gov/pr/sars/pdf/ak2012.pdf
http://www.nmfs.noaa.gov/pr/laws/mmpa/

Clausen, D. M., and C. J. Rodgveller. 2013. Deep-water longline experimental survey for giant grenadier, Pacific grenadier, and sablefish in the western Gulf of Alaska. NOAA Tech. Memo. NMFS-AFSC-247, 30 p.
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-247.pdf

NOAA Resource Ecology and Ecosystem Modeling, Ecosystem Assessments
http://www.afsc.noaa.gov/refm/reem/Assess/Default.htm
http://access.afsc.noaa.gov/reem/EcoWeb/
http://www.st.nmfs.noaa.gov/fate/

NOAA, 2002. Technical Memorandum NMFS-AFSC-130. A Comparison of the Eastern Bering and Western Bering Sea Shelf and Slope Ecosystems Through the Use of Mass-Balance Food Web Models. By K. Y. Aydin, V. V. Lapko, V. I. Radchenko, and P. A. Livingston
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-130.pdf

NOAA / AFSC 2006. Ecosystem modeling for fishery sustainability. A Case Study for the Gulf of Alaska. July-August 2006. Resource Ecology and Fisheries Management Division
http://www.afsc.noaa.gov/Quarterly/jas2006/jasfeaturelead.htm

NOAA, 2011. Pacific Halibut–Sablefish IFQ Report, Fishing Year 2011
https://alaskafisheries.noaa.gov/ram/ifq/rtf11.pdf

NOAA / AFSC, 2012. Assessment of the shark stock complex in the Bering Sea and Aleutian Islands By. Cindy A. Tribuzio, Katy Echave, Cara Rodgveller, Peter-John Hulson. December 2012.
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIshark.pdf

NOAA / AFSC, 2012. Assessment of the Shark stock complex in the Gulf of Alaska (Executive Summary). By Cindy A. Tribuzio, Katy Echave, Cara Rodgveller, Peter Hulson. November 2012
http://www.afsc.noaa.gov/REFM/docs/2012/GOAshark.pdf

NOAA / AFSC. December 2012. Assessment of the sablefish stock in Alaska. By Dana H. Hanselman, Chris R. Lunsford, and Cara J. Rodgveller. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAsablefish.pdf

NOAA / AFSC, 2012. Ecosystem Considerations. 2012
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

NOAA / AFSC, 2012. Economic Status of the Groundfish Fisheries Off Alaska, 2011. (IN: Stock Assessment and Fishery Evaluation (SAFE) for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea / Aleutian Islands Area)
http://www.afsc.noaa.gov/REFM/Docs/2012/economic.pdf

NOAA / AFSC, 2012. Assessment of the Grenadier Stock Complex in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. SAFE, 2012. Appendix 1. By Cara Rodgveller, David Clausen, and Pete Hulson.
http://www.afsc.noaa.gov/REFM/docs/2012/BSAIgrenadier.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOAgrenadier.pdf

NOAA / AFSC, 2012. Seabird Bycatch Estimates for Alaskan Groundfish Fisheries, 1993-2011
http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf

NOAA / NMFS, 2013. Alaska marine mammal stock assessments, 2012. NOAA Tech. Memo. NMFSAFSC- 245, 282 p. By Allen, B. M., and R. P. Angliss.
http://www.nmfs.noaa.gov/pr/sars/region.htm

NPFMC . June 2012. Discussion Paper. Inclusion of Grenadiers in the Fishery Management Plans for the Bering Sea and Aleutian Islands and/or the Gulf of Alaska. Agenda Item D-1(d).
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/GrenadierDiscPaper521.pdf

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.

Shotwell, S.K., D.H. Hanselman, and I.M. Belkin. 2012. Toward biophysical synergy: Investigating advection along the Polar Front to identify factors influencing Alaska sablefish recruitment. Deep-Sea Res. II, http://dx.doi.org/10.1016/j.dsr2.2012.08.024

Yano, K. & Dahlheim, M. E. (1995*a*) Behavior of killer whales *Orcinus orca* during longline fishery interactions in the southeastern Bering Sea and adjacent waters. *Fisheries Science* **61** (4), 584–589.

Yano, K. & Dahlheim, M. E. (1995*b*) Killer whale, *Orcinus orca*, depredation on longline catches of bottomfish in the southeastern Bering Sea and adjacent waters. *Fishery Bulletin* **93,** 355–372.

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

8. Performance specific to agreed corrective action plans

Not Applicable. This is the 2nd FAO RFM US Alaska sablefish surveillance assessment report (October 2013). No non conformances were issued during full assessment. However, a number of issues were identified for review during surveillance to identify whether management actions were being taken to improve issues relating to bycatch in the sablefish fleet and the restructuring of the observer program. The developments have been positive and proceeded as planned. The newly restructured observer program began deployments in January of 2013. Data from the 2013 fishery will be available in 2014 and included in future management measures.

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

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

Not applicable, no new non conformances have been issued.

10. Future Surveillance Actions

The assessment team will review the following during the 2014 surveillance assessment: 1) Review of potential re-instatement of the Alaska Coastal Management Plan and 2) Developments, coverage and data produced by the restructured observer program. For this surveillance these areas have all been addressed under the respective sections of this report.

11. Client signed acceptance of the action plan

Not applicable.

12. Recommendation and Determination

Following this Second surveillance assessment, finalized in November 2013, the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the US Alaska sablefish federal and state commercial fisheries, under federal (National Marine Fisheries Service/North Pacific Fishery Management Council) and state (Alaska Department of Fish and Game/Board Of Fisheries) management, fished with benthic longline, pot and trawl gear (within Alaska's 200 nm EEZ).

13. References

Biography	URL
Sigler, Michael F. and Lunsford, Chris R. Alaska Fisheries Science Center Survey protocol for the Alaska sablefish longline survey. Accessed 2013.	http://www.afsc.noaa.gov/ABL/MESA/pdf/LSprotocols.pdf
1987. ADF&G. Estimating the guideline harvest range for sablefish in inside waters of Prince William Sound. Morrison, Rance. Accessed 2013.	http://www.sf.adfg.state.ak.us/FedAidPDFs/RIR.2C.1987.04.pdf
2002. NOAA Technical Memorandum NMFS-AFSC-130. A Comparison of the Eastern Bering and Western Bering Sea Shelf and Slope Ecosystems Through the Use of Mass-Balance Food Web Models. Accessed 2013.	http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-130.pdf
2006. NOAA Fisheries. Research Feature: Ecosystem Modelling for Fishery Sustainability. A Case Study for the Gulf of Alaska. Accessed 2013.	http://www.afsc.noaa.gov/Quarterly/jas2006/jasfeaturelead.htm
2010. NOAA Fisheries. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. Accessed 2013	http://alaskafisheries.noaa.gov/habitat/seis/efheis.htm
2010. The Brig. Alaska Fisheries enforcement news. Accessed 2013.	http://deckboss-thebrig.blogspot.co.uk/2010_04_01_archive.html
2011. ADF&G. Fishery Management Report 11-70. 2012 Report to the Alaska Board Fisheries Groundfish Fisheries: Southeast Alaska and Yakutat. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/FMR11-70.pdf
2011. Alaska Department of Environmental Conservation. 2012. Water Division. Homepage. Accessed 2013	http://dec.alaska.gov/water
2011. Alaska Department of Environmental Conservation. Homepage. Accessed 2013.	http://dec.alaska.gov/
2011. NOAA Policy for Assessment of Penalties and Permit Sanctions – March 16, 2011. Accessed 2013.	http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf
2011. NOAA. Office of General Counsel. Penalty Policy and Schedules. Accessed 2013.	http://www.gc.noaa.gov/enforce-office3.html
2011. NOAA. Update of NOAA Fisheries Enforcement Programs and Operations. Accessed 2013.	http://www.nmfs.noaa.gov/sfa/reg_svcs/Councils/ccc_2011/Tab%20L%20-%20Enforcement%20Issues/Enforcement%20Issues.pdf
2012 IPHC Stock Assessment Survey. All Regions. Accessed 2013.	http://www.iphc.int/data/survey/2012/2012ssaall_revised.pdf
2012 NSEI (Northern Southeast Inside Subdistrict) Sablefish Mark-Tag Survey. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/FDS13-29.pdf
2012. ADF&G. Regional Information Report IJ12-12. 2011 Southern Southeast Inside Subdistrict Sablefish Longline Survey Field Report. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/RIR.1J.2012.12.pdf
2012. Department of Labor and workforce development. AVTEC Alaska Institute of Technology. Alaska Maritime Training Centre. Accessed 2013.	http://www.avtec.edu/AMTC-Home.aspx
2012. Ecosystems Considerations. November 16, 2012. Accessed 2013.	http://www.afsc.noaa.gov/REFM/Docs/2012/ecosystem.pdf
2012. Hanselman, Dana H. Lunsford, Chris R. and Rodgveller, Cara J. Assessment of the Sablefish Stock in Alaska. Accessed 2013.	http://www.afsc.noaa.gov/REFM/Docs/2012/GOAsablefish.pdf
2012. Hartill, Trent. Fishery Management Report 12-38. Annual Management Report for the Bering-Sea Aleutian Islands Area State-Waters Groundfish Fisheries and Groundfish Harvest from Parallel Seasons in 2011. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/FMR12-38.pdf
2012. NOAA Fisheries. Discussion Paper. Inclusion of Grenadiers in the Fishery Management Plans For the Bering Sea and Aleutian Islands and/or the Gulf of Alaska. Accessed 2013	http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/GrenadierDiscPaper521.pdf
2012. NOAA Fisheries. National Marine Fisheries Service. Alaska Regional Office. FISHERY MANAGEMENT PLAN for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council. Accessed 2013	http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.pdf

2012. NOAA Fisheries. STOCK ASSESSMENT AND FISHERY EVALUATION REPORT FOR THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS AREA: ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2011. Accessed 2013.	http://www.afsc.noaa.gov/REFM/Docs/2012/economic.pdf
2012. NOAA. Pacific Halibut -Sablefish IFQ Report Fishing Year 2011. Accessed 2013.	http://alaskafisheries.noaa.gov/ram/ifq/rtf11.pdf
2012. NPFMC ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2011. Ben Fissel, Michael Dalton, Ron Felthoven, Brian Garber-Yonts, Alan Haynie, Amber Himes-Cornell, Stephen Kasperski, Jean Lee, Dan Lew, Lisa Pfei er, Jennifer Sepez, Chang Seung. Accessed 2013. SAFE	http://www.afsc.noaa.gov/REFM/Docs/2012/economic.pdf
2012. NPFMC. Assessment of the Grenadier Stock Complex in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. Accessed 2013. SAFE	http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIgrenadier.pdf
2012. NPFMC. STOCK ASSESSMENT AND FISHERY EVALUATION REPORT. FOR THE GROUNDFISH RESOURCES OF THE BERING SEA/ALEUTIAN ISLANDS REGIONS The Plan Team for the Groundfish Fisheries of the Bering Sea and Aleutian Islands. Accessed 2013.	http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIintro.pdf
2012. Restoring Coastal Management Alaska Sea Party. Coastal Ballot Initiative Falls Short. Accessed 2013.	http://www.alaskacoastalmanagement.org/ACMP_Election_Results_8-29-12.pdf
2012. NOAA Fisheries. National Marine Fisheries Service. Alaska Regional Office. Conservation Issues. Development Plan for 2013. Accessed 2013.	http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIpdf
2013. ADF&G. Fishery Management Report No. 13-04. Cook Inlet Area Groundfish Management Report 2005-2011. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/FMR13-04.pdf
2013. ADF&G. Fishery Management Report No. 13-08. Southeast Alaska Northern Inside Sablefish Fishery Information Report with outlook for the 2012 Fishery. Accessed 2013.	http://www.adfg.alaska.gov/FedAidPDFs/FMR13-08.pdf
2013. ADF&G. Habitat Regulations. Accessed 2013.	http://www.adfg.alaska.gov/index.cfm?adfg=habitatregulations.main
2013. ADF&G. Home Page. Accessed 2013.	http://www.adfg.alaska.gov/index.cfm?adfg-fisheriesboard.main
2013. ADF&G. News Release. 2013 ALEUTIAN ISLANDS STATE-WATERS SABLEFISH SEASON OPENS MAY 15. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/255960594.pdf
2013. ADF&G. News Release. 2013 NORTHERN SOUTHEAST INSIDE (NSEI) SUBDISTRICT SABLEFISH FISHERY ANNUAL HARVEST OBJECTIVE ANNOUNCEMENT. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/293718980.pdf
2013. ADF&G. News Release. 2013 NORTHERN SOUTHEAST INSIDE (NSEI) SUBDISTRICT SABLEFISH FISHERY ANNUAL HARVEST OBJECTIVE ANNOUNCEMENT. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/293718980.pdf
2013. ADF&G. News Release. FISHERY ANNOUNCEMENT COOK INLET SABLEFISH OPENS EO # 2-GF-H-06-13. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/302769255.pdf
2013. ADF&G. News Release. FISHERY UPDATE 2013 CENTRAL REGION GROUNDFISH FISHERIES OUTLOOK. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/240783172.pdf
2013. ADF&G. News Release. PRINCE WILLIAM SOUND COMMERCIAL SABLEFISH FISHERY UPDATE SEASON OPENING AND QUOTA ALLOCATIONS. Accessed 2013.	http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/255897087.pdf
2013. ADF&G. Sablefish Fishery Update for SE Alaska. Accessed 2013.	http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareasoutheast.sablefish_fishery_update
2013. ADF&G. Sablefish Management. Accessed 2013.	http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management
2013. Alaska Department of Natural Resources. Homepage. Accessed 2013.	http://dnr.alaska.gov/
2013. Alaska Marine Safety Education Association. Home Page. Accessed 2013.	http://www.amsea.org/
2013. Alaska Wildlife Troopers. Mission Statement. Accessed 2013.	http://dps.alaska.gov/AWT/mission.aspx
2013. Department of Safety. Alaska Wildlife Troopers. Men and Women of Alaska Protecting Alaska's Future. Accessed 2013.	http://dps.alaska.gov/awt/
2013. e-Landings. Home Page. Accessed 2013.	https://elandings.alaska.gov/

2013. NOAA Fisheries. 679.42 Limitations on use of QS and IFQ. Accessed 2013	http://alaskafisheries.noaa.gov/regs/679d42.pdf
2013. NOAA Fisheries. Alaska Fisheries Regulations and Notices. Federal Fisheries Regulations 50 CFR Part 679: Fisheries of the Exclusive Economic Zone Off Alaska. Accessed 2013.	http://alaskafisheries.noaa.gov/regs/default.htm
2013. NOAA Fisheries. Individual Fishing Quota (IFQ) Program. Accessed 2013.	http://alaskafisheries.noaa.gov/ram/ifq.htm
2013. NOAA Fisheries. Office of Law Enforcement. Homepage. Accessed 2013.	http://www.nmfs.noaa.gov/ole/index.html
2013. NOAA Fisheries. Online (Web) Services. Accessed 2013.	http://alaskafisheries.noaa.gov/ram/webapps.htm
2013. NOAA Fisheries. Protected Species. Laws & Policies. Marine Mammal Protection Act (MMPA). Accessed 2013.	http://www.nmfs.noaa.gov/pr/laws/mmpa/
2013. NOAA Fisheries. Protected Species. Marine Mammal Stock Assessment Reports (SARs) by Region. Accessed 2013.	http://www.nmfs.noaa.gov/pr/sars/region.htm
2013. NOAA Fisheries. Resource Ecology and Ecosystems Modelling. Ecosystems Assessments. Accessed 2013.	http://www.afsc.noaa.gov/refm/reem/Assess/Default.htm
2013. NOAA Fisheries. Resource Ecology and Management Division. Accessed 2013.	http://www.afsc.noaa.gov/REFM/
2013. NOAA Technical Memorandum NMFS-AFSC-245. Alaska Marine Mammal Stock Assessments, 2012. Accessed 2013.	http://www.nmfs.noaa.gov/pr/sars/pdf/ak2012.pdf
2013. NOAA Technical Memorandum NMFS-AFSC-247 Deep-Water Longline Experimental Survey for Giant Grenadier, Pacific Grenadier, and Sablefish in the Western Gulf of Alaska. Accessed 2013.	http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-247.pdf
2013. NOAA. C-5 CQE Halibut/Sablefish Block Restrictions. Accessed 2013.	http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/rural_outreach/CQEsmallBlockRestrictmotion413.pdf
2013. NOAA. Discussion Paper. Allow the use of pot gear for Sablefish IFQS in the Gulf of Alaska. May 30, 2013. Accessed 2013.	http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/halibut/D1bSupplemental.pdf
2013. NOAA. NOAA Technical Memorandum NMFS-AFSC-254. Report to Industry on the Alaska Sablefish Tag Program, 1972-2012.	http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-254.pdf
2013. NOAA. Office of Law Enforcement. Division Enforcement Priorities for 2013. Accessed 2013.	http://www.nmfs.noaa.gov/ole/docs/2013/ole-division-priorities-2013-final.pdf
2013. NPFMC. Use of Bering Sea Sablefish Total Allowable Catch in IFQ/non-IFQ Fisheries. Discussion Paper. March 2013. Summary. Accessed 2013.	http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/SPECS/BSsablefishTAC_dp413.pdf
2013. SEAFA. Chatham Blackcod Quota. Accessed 2013.	http://www.seafa.org/?p=190
2013. The IUCN Red list of endangered species. Squalus acanthias (Northwest Pacific subpopulation). Accessed 2013.	http://www.iucnredlist.org/details/61413/0
2013. United States Coast Guard. Protecting the last Frontier. Mission. Accessed 2013.	http://www.uscg.mil/d17/
ADF&G Sablefish Meeting March 8, 2012. 2012 Sablefish Stock Status and Fishery Meeting. Accessed 2013.	http://www.scribd.com/fullscreen/91606618?access_key=key-4ld6z5dumwp4tvok934&allow_share=false&show_recommendations=false
ADF&G. 2013-2014 Statewide Commercial Groundfish Fishing Regulations. Accessed 2013.	http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/Groundfish-2013-2014.pdf
Alaska Department of Fish And Game. 2012. Sablefish (Anoplopoma fimbria) Management. P.O. Box 115526 1255 W. 8th Street Juneau, AK 99811-5526. Accessed 2013	http://www.adfg.alaska.gov/index.cfm?adfg=sablefish.management
Alaska Department of Natural Resources. Office of Project Management and Permitting Welcome to the Office of Project Management & Permitting Homepage. Accessed 2013.	http://dnr.alaska.gov/commis/opmp/
Alaska Department of Natural Resources. Office of Project Management and Permitting. Alaska National Interest Lands Conservation Act (ANILCA). Accessed 2013.	http://dnr.alaska.gov/commis/opmp/anilca/
Alaska Fisheries Science Centre. Fisheries Monitoring and Analysis Division. 2013 Observer Sampling Manual. North Pacific Groundfish Observer Program November 1, 2012. Accessed 2013	http://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2013.pdf
Alaska Marine Ecosystem Considerations. December 2012 Update. Accessed 2013.	http://access.afsc.noaa.gov/reem/EcoWeb/

Cook Inlet Offshore Oil & Gas Exploration Permit Application & Approval Process. Prepared by Arcadis. Accessed 2013.	http://dog.dnr.alaska.gov/Permitting/Documents/Arcadis/Arcadis_Flowchart_CookInletOffshore_Draft.pdf
Hanselman, D,H. Lunsford, C,R. Rodgveller, C, J. Assessment of the sablefish stock in Alaska. NPFMC Bering Sea, Aleutian Islands and Gulf of Alaska. SAFE. 2012.	http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIsablefish.pdf
Himes-Cornell, A. Package,C. and Durland, A. NOAA Technical Memorandum NMFS-AFSC-230 Improving Community Profiles. Accessed 2013 for the North Pacific Fisheries	http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-230.pdf
ICES Journal of Marine Science. Use of annual catch limits to avoid stock depletion in the Bering Sea and Aleutian Islands management area (Northeast Pacific).2009. Accessed 2013	http://icesjms.oxfordjournals.org/content/67/9/1861.full
Legis.state. Alaska. Chapter 28 Groundfish. Accessed 2013	http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=%5bJUMP:%27Title5Chap28%27%5d/doc/%7b@1%7d?firsthit
NOAA Fisheries. 2012. Alaska Regional Division Office. Habitat Conservation Division. Accessed 2013	http://www.fakr.noaa.gov/habitat/default.htm
NOAA Fisheries. Alaska Fisheries Science Centre. Economic and Social Research Program. Community Program for North Pacific Fisheries - Alaska. Accessed 2013	http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php
NOAA Fisheries. In the news. Accessed 2013.	http://www.alaskafisheries.noaa.gov/
NOAA Fisheries. Restricted Access Management. Permits, Licenses, Reports. Accessed 2013.	http://alaskafisheries.noaa.gov/ram/
NOAA Fisheries. Restructured Observer Program. North Pacific Groundfish and Halibut Fisheries Observer Program. Accessed 2013.	http://alaskafisheries.noaa.gov/sustainablefisheries/observers/
NOAA Fisheries. Seabird Bycatch Reduction Program - Guide for Alaska Fishermen. Seabird Avoidance Gear and Methods: Information for Alaska Fishermen. Accessed 2013.	http://alaskafisheries.noaa.gov/protectedresources/seabirds/guide.htm
North Pacific Fishery Management Council. 2012. In the News. 605 West 4th, Suite 306, Anchorage, Alaska 99501-2252. Accessed 2012	http://www.fakr.noaa.gov/npfmc/
Science Direct. Toward biophysical synergy: Investigating advection along the Polar Front to identify factors influencing Alaska sablefish recruitment. Accessed 2013.	http://www.sciencedirect.com/science/article/pii/S0967064512001646
Seagrant. Alaska Sea Grant Marine Advisory Program. Fishbiz: Alaska Fisheries Business Assistance Project Accessed 2013.	http://seagrant.uaf.edu/map/fishbiz/index.php
Seagrant. Alaska Sea Grant Marine Advisory Program. Home Page. Accessed 2013.	http://seagrant.uaf.edu/map/
Sepez,J. A. Tilt,B. D. Package,C. L. H. M. Lazrus,H. M. Vaccaroand I. NOAA Technical Memorandum NMFS-AFSC-160 Community Profiles for North Pacific Fisheries –Alaska. Accessed 2013	http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-160/NOAA-TM-AFSC-160.pdf
Standards of Training Certification and Watchkeeping. Home Page. Accessed 2013.	http://www.stcw.org/
Touchngo.com 5 AAC 28.089. Guiding principles for groundfish fishery regulations. Accessed 2013.	http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm
Tribuzio, Cindy A. Echave,Katy. Rodgveller,Cara. Hulson, Peter. 2012. NPFMC Assessment of the Shark stock complex in the BSAI (Executive Summary). Accessed 2013. SAFE Alaska (Executive Summary)Acc.	http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIshark.pdf
Tribuzio, Cindy A. Echave,Katy. Rodgveller,Cara. Hulson, Peter. 2012. NPFMC Assessment of the Shark stock complex in the Gulf of Alaska (Executive Summary). Accessed 2013. SAFE Alaska (Executive Summary)Acc.	http://www.afsc.noaa.gov/REFM/Docs/2012/GOAshark.pdf
US Department of the Interior. Latest Happenings. Accessed 2013.	http://www.doi.gov/index.cfm

Appendix 1

Assessment Team Details

Dr. Geraldine Criquet (Assessor)

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

Alan Sinclair (Assessor)

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

Steve Nelson (Assessor)

Steve Nelson has about 25 years of experience in marine resource management and fisheries. He holds an M.S. in Estuarine Ecology from George Mason University and a B.A. in Economics from the University of Virginia. He began his career at the EPA Chesapeake Bay Program in 1990 where he served as scientific program manager for six years at the University of Maryland. Later, he worked as Director of the Tillamook Bay National Estuary Project serving as extension faculty at Oregon State University to develop a *Comprehensive Conservation and Management Plan (CCMP)* for Tillamook Bay with focus on salmon conservation, habitat restoration, and water quality improvements. From 1999 to 2003 he worked as a conservation planner for the World Wildlife Fund in the Russian Far East to develop ecoregion conservation strategies for the Amur River basin, Pacific coastal areas and

Arctic Seas. Beginning in 2005 he worked as contractor to the US Agency for International Development conducting biodiversity assessments and managing international coastal, fishery, and river basin projects. He has worked as a contractor to Global Trust Certification since 2010 and joined the company full time in 2013. He is also a researcher and PhD candidate at George Mason University with a focus on coastal management and fisheries.

Erica Fruh (Assessor)

Erica Fruh has been involved in commercial fisheries management for over 15 years. She earned her BSc in Marine Biology from Auburn University, and her MSc in Marine Resource Management from Oregon State University. Her MSc project focused on bycatch in trawl and longline fisheries. Previous experience includes fishery biologist roles with the Oregon Department of Fish and Wildlife, the Pacific States Marine Fisheries Commission and NOAA Fisheries. She has worked with most fishing gear types used along the U.S. west coast, spending numerous days at sea participating in tagging studies, population monitoring, bycatch monitoring and fishing mortality studies. She worked as a commercial fisheries observer in the U.S. west coast groundfish trawl fishery, the Oregon pink shrimp fishery and the seine sardine fishery. She spent 10 years contributing to the National Marine Fisheries Service U.S. west coast groundfish bottom trawl survey gathering data for stock assessments, and leading projects on marine debris, seabird sightings and age structure collection.

Vito Ciccia Romito (Lead Assessor)

Vito holds a BSc in Ecology and an MSc in Tropical Coastal Management (Newcastle University, United Kingdom). His BSc studies focused on bycatch, discards, benthic impact of commercial fishing gear and relative technical solutions, after which he spent a year in Tanzania as a Marine Research officer at Mafia Island Marine Park carrying out biodiversity assessments and monitoring studies of coral reef, mangrove and seagrass ecosystems. Subsequently, for his MSc, he focused on fisheries assessment techniques, ecological dynamics of overexploited tropical marine ecosystems, and evaluation of low trophic aquaculture as a support to artisanal reef fisheries. Since 2010, he has been fully involved through Global Trust with the FAO-based RFM Assessment and Certification program covering the Alaska salmon, halibut, sablefish, pollock, BSAI crab, Pacific cod and flatfish commercial fisheries, as well as the Icelandic cod, saithe, haddock and redfish fisheries. Vito is also a lead, third party IRCA approved auditor.