



**ALASKA RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION
SURVEILLANCE REPORT**

For The
Alaska Flatfish Commercial Fisheries

On behalf of
Alaska Seafood Cooperative

Standard Owner
Alaska Seafood Marketing Institute

Assessors

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Glossary

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

I. Summary and Recommendations

This surveillance report is produced on behalf of the Alaska Seafood Cooperative in accordance with the Alaska Based Responsible Fisheries Management (RFM) Certification Program. The initial application was made in September 2012. After a Validation Assessment was completed in July 2013, a full Assessment Team was formed to undertake the assessment and final certification determination was awarded on the 05th December 2013.

This report is the **2nd Surveillance Report (ref: AK/FLAT/001.2/2016)** for the Alaska flatfish federal and state commercial fisheries. 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, first surveillance audit in 2014) and to determine whether these changes (if any) and current practices, remain consistent with the overall confidence rating scorings of the fishery allocated during initial certification. In addition to this, any areas reported as “items for surveillance” or corrective action plans in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. No non-conformances were identified since certification was granted.

The Unit of Certification is the Alaska flatfish complex distributed in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) and specifically includes: BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI/GOA arrowtooth flounder (*Atheresthes stomias*), BSAI/GOA flathead sole (*Hippoglossoides elassodon*), BSAI Greenland turbot (*Reinhardtius hippoglossoides*), BSAI Kamchatcka flounder (*Atheresthes evermanni*), BSAI/GOA northern rock sole (*Lepidopsetta polyxystra*), GOA rex sole (*Glyptocephalus zachirus*), GOA southern rock sole (*Lepidopsetta bilineata*) and BSAI yellowfin sole (*Limanda aspera*). The Alaska flatfish complex commercial fisheries employ Alaska flatfish trawl gear and longline gear (Greenland Turbot only) within Alaska’s jurisdiction (200 nautical miles EEZ). These fisheries are principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).

The surveillance assessment was conducted according to the Global Trust Certification procedures for Alaska Responsible Fisheries Management Certification using Alaska RFM Conformance Criteria V1.2 fundamental clauses as the assessment framework.

The assessment was conducted by a team of Global Trust appointed Assessors comprising of one externally contracted fishery expert and Global Trust internal staff. 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 Unit of Certification is the Alaska flatfish complex distributed in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) and specifically includes: BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI/GOA arrowtooth flounder (*Atheresthes stomias*), BSAI/GOA flathead sole (*Hippoglossoides elassodon*), BSAI Greenland turbot (*Reinhardtius hippoglossoides*), BSAI Kamchatka flounder (*Atheresthes evermanni*), BSAI/GOA northern rock sole (*Lepidopsetta polyxystra*), GOA rex sole (*Glyptocephalus zachirus*), GOA southern rock sole (*Lepidopsetta bilineata*) and BSAI yellowfin sole (*Limanda aspera*). The Alaska flatfish complex commercial fisheries employ Alaska flatfish trawl gear and longline gear (Greenland Turbot only) within Alaska's jurisdiction (200 nautical miles EEZ). These fisheries are principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).

This 2nd Surveillance Report documents the assessment result for the continued certification of commercially exploited Alaska flatfish fisheries to the Alaska RFM Certification Program. This is a voluntary program that has been developed by ASMI who wish to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed according to the Alaska RFM Program.

The assessment was conducted according to the Global Trust procedures for Alaska RFM Certification using the fundamental clauses of the Alaska RFM Conformance Criteria Version 1.2 (Sept 2011) in accordance with ISO 17065 accredited certification procedures. The assessment is based on the fundamental clauses specified in the Alaska RFM Conformance Criteria. It is based on six 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); including:

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

These six major components are supported by 13 fundamental clauses (+ 1 in case of enhanced fisheries) that guide the FAO-Based RFM Certification Program surveillance assessment.

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

1.1. Recommendation of the Assessment Team

Following this 2nd Surveillance Assessment, in 2016, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fisheries, the Alaska flatfish complex distributed in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) – specifically including: BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI/GOA arrowtooth flounder (*Atheresthes stomias*), BSAI/GOA flathead sole (*Hippoglossoides elassodon*), BSAI Greenland turbot (*Reinhardtius hippoglossoides*), BSAI Kamchatcka flounder (*Atheresthes evermanni*), BSAI/GOA northern rock sole (*Lepidopsetta polyxystra*), GOA rex sole (*Glyptocephalus zachirus*), GOA southern rock sole (*Lepidopsetta bilineata*) and BSAI yellowfin sole (*Limanda aspera*). The Alaska flatfish complex commercial fisheries employ Alaska flatfish trawl gear and longline gear (Greenland Turbot only) within Alaska's jurisdiction (200 nautical miles EEZ). These fisheries are principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).

2. Fishery Applicant Details

Applicant Contact Information			
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3. Unit of Certification

Unit of Certification				
U.S. ALASKA FLATFISH COMMERCIAL FISHERIES				
	Fish Species (Common & Scientific Name)	Geographical Location of Fishery	Gear Type	Principal Management Authority
1.	Yellowfin sole, <i>Limanda aspera</i>	Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
2.	Flathead sole, <i>Hippoglossoides elassodon</i>	Gulf of Alaska, Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
3.	Northern rock sole, <i>Lepidopsetta polyxstra</i>	Gulf of Alaska, Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
4.	Southern rock sole, <i>Lepidopsetta bilineatus</i>	Gulf of Alaska	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
5.	Arrowtooth flounder, <i>Atheresthes stomias</i>	Gulf of Alaska, Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
6.	Kamchatka flounder, <i>Atheresthes evermanni</i>	Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
7.	Alaska plaice, <i>Pleuronectes quadrituberculatus</i>	Bering Sea and Aleutian Islands	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC
8.	Greenland turbot, <i>Reinhardtius hippoglossoides</i>	Bering Sea and Aleutian Islands	Non-pelagic Trawl, Longline	NOAA NMFS Alaska, NPFMC
9.	Rex sole, <i>Glyptocephalus zachirus</i>	Gulf of Alaska	Non-pelagic Trawl	NOAA NMFS Alaska, NPFMC

4. Surveillance Meetings

Date	Organization	Relevant Meetings attended, topics discussed
Dec. 7-11, 2015	North Pacific Fishery Management Council Meetings, Hilton Hotel, Anchorage, Alaska.	<p>A) Scientific and Statistical Committee: Dec 7-9</p> <ul style="list-style-type: none"> • Ecosystem Report Cards • BSAI, GOA SAFE presentations • BSAI, GOA GF Plan Team Minutes • Joint GF Plan Team Minutes <p>B) Advisory Panel: Dec 7-10</p> <ul style="list-style-type: none"> • BSAI, GOA Specifications • Halibut Management Framework • GOA Trawl Bycatch Management Work plan • GOA Salmon PSC <p>C) NPFM Council: Dec 9-11</p> <ul style="list-style-type: none"> • BSAI, GOA Specifications • GOA Salmon PSC Limits • Halibut PSC

5. Assessment Outcome Summary

Fundamental Clauses Summaries

Clause 1: Structured and legally mandated management system

Evidence adequacy rating: High

The Alaska flatfish commercial fisheries are 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). In federal waters, the Alaska flatfish fisheries are managed under the NPFMC's Gulf of Alaska ([GOA](#)) and Bering Sea and Aleutian Islands ([BSAI Groundfish Fishery Management Plans](#)) (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The US Coast Guard (USCG), the NMFS Office of Law Enforcement (OLE) enforce fisheries regulations in federal waters.

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) tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. The Agency provides a great deal of information on their website, including agenda of meetings, discussion papers, and records of decisions. The Council 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 (MSA) is the primary domestic legislation governing the 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 flatfish fisheries in those regions. Both FMPs present long-term management objectives for the Alaska flatfish fisheries.

Clause 4: Fishery data

Evidence adequacy rating: High

Reliable and accurate data required for assessing the status of fisheries and ecosystems - including data on retained catch of fish, by catch, discards and waste are collected (BSAI and GOA surveys, catch data, observer data) routinely. The NMFS collects fishery data and conduct fishery independent surveys to assess the flatfish fisheries and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. NMFS also produces various economic reports for Alaskan fisheries.

Clause 5: Stock assessment**Evidence adequacy rating: High**

In Alaska, there are regular (annual, biannual) peer-reviewed stock assessment activities appropriate for the fishery, its range, flatfish species biology and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization. NMFS conducts stock assessment and biological research in the EEZ off Alaska on FMP species. NMFS through its facilities and staff in Seattle and Alaska generate the scientific information and analysis necessary for the conservation, management, and utilization of the region's groundfish resources. For each fishery under federal jurisdiction, the NPFMC and NMFS produce annual Stock Assessment & Fishery Evaluation (SAFE) reports. The adequacy and appropriateness of the stock assessments are ensured by extensive peer review, including reviews by external experts.

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

The ASFC SAFE reports consist of three volumes: a volume containing stock assessments, a volume containing economic analysis, and a volume describing ecosystem considerations. The stock assessment volume contains a chapter or sub-chapter for each stock or stock complex in the "target species" category, and a summary chapter prepared by the Groundfish Plan Team. Each chapter contains estimates of all annual harvest specifications except TAC, all reference points needed to compute such estimates, and all information needed to make annual status determinations with respect to "overfishing" and "overfished" conditions.

Clause 7: Precautionary approach**Evidence adequacy rating: High**

The process for management of the Alaska flatfish complex includes the specification of objectives, development of limit and target reference points, agreement on management actions and assessment of management performance with respect to the accepted reference points. The management steps for this fishery ensure that target reference points are not exceeded and that the risk of exceeding limit reference points is low. In cases where the species/stock has been overfished target reference points are established which allow recovery in a reasonable time frame supported by projections for the foreseeable future. When new uncertainties arise, research recommendations are made and there is accountability in subsequent years to follow up on related action items. However, these uncertainties do not lead to a postponement for providing advice, in all cases precaution is the rule.

Clause 8: Management measures**Evidence adequacy rating: High**

The Alaska flatfish commercial fisheries are managed according to a modern management plan that attempts to balance long-term sustainability of the resources with optimum utilization. For every change/amendment or new development affecting fisheries management and therefore modifying the FMPs, there is an evaluation of alternative conservation and management measures, including considerations of their cost effectiveness and social impact. By-catches, discards, and prohibited species catches are all closely managed, and actions taken where required, such as in the 2015 closure of fisheries in the GOA for exceeding chinook PSC limits.

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

There are well defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels. Measures are also introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks. Also, efforts are made to ensure that resources and habitats critical to the wellbeing of such resources which have been adversely affected by fishing or other human activities are restored.

Clause 10: Appropriate standards of fisher's competence**Evidence adequacy rating: High**

Alaska enhances through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishermen are maintained up to date by the fishery management organizations.

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

The Alaska flatfish fishery fleet uses enforcement measures including vessel monitoring systems (VMS) on board vessels, USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. 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).

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, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors affecting flatfish, other groundfish and associated species and their habitats. Findings and conclusions are published in SAFE documents, annual Ecosystem Considerations documents, and other research reports. The SAFE documents summarize ecosystem considerations for the major flatfish stocks. They include sections for **1) Ecosystem effects on the stock** and **2) Effects of the fishery on the ecosystem**. Adverse impacts on the fishery on the ecosystem including bycatch and discards, ETP species interactions and gear habitat interactions have been appropriately assessed and effectively addressed. All the flatfish stocks in Alaska appear to be under very light exploitation rate minimizing potentially negative food-web interactions in the ecosystem.

6. Conformity Statement

Following this 2nd Surveillance Assessment, in 2016, the assessment team recommends that continued Certification under the Alaska Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fisheries, the Alaska flatfish complex distributed in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) – specifically including: BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI/GOA arrowtooth flounder (*Atheresthes stomias*), BSAI/GOA flathead sole (*Hippoglossoides elassodon*), BSAI Greenland turbot (*Reinhardtius hippoglossoides*), BSAI Kamchatka flounder (*Atheresthes evermanni*), BSAI/GOA northern rock sole (*Lepidopsetta polyxystra*), GOA rex sole (*Glyptocephalus zachirus*), GOA southern rock sole (*Lepidopsetta bilineata*) and BSAI yellowfin sole (*Limanda aspera*). The Alaska flatfish complex commercial fisheries employ Alaska flatfish trawl gear and longline gear (Greenland Turbot only) within Alaska's jurisdiction (200 nautical miles EEZ). These fisheries are principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).

A. The Fisheries Management System

Fundamental 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.

No. Supporting clauses	17
Supporting clauses applicable	9
Supporting clauses not applicable	8
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

The structure and function of the management system governing the Alaska Flatfish fisheries in Alaska.

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

The primary layer of governance for the Alaska Flatfish fisheries is dictated by the Magnuson Stevens Act (MSA). The MSA, as amended last on January 12th 2007, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all Fishery Management Plans (FMP) must be consistent. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, an FMP and any necessary amendments, for each fishery under its authority that requires conservation and management actions, i.e. the annual setting of OFL/ABC/TAC/ACL.

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

The federal Fishery Management Plans (FMPs), more specifically, 1) the GOA Groundfish FMP¹, and 2) the BSAI Groundfish FMP² govern the management of the flatfish federal fisheries. In federal waters (3-200 nm), the Alaska flatfish fisheries are managed by the NPFMC and the NMFS Alaska Region. In addition, NMFS Alaska Regional Office conducts biological studies, stock survey and stock assessment reports. Current management measures consider the whole stocks biological units (i.e. structure and composition contributing to its resilience over their entire area of distribution, the area through which the species migrate during their life cycle and other biological characteristics of the stock).

1.3/1.4/1.5/1.6 Transboundary stocks.

¹ NPFMC Fishery Management Plan for Groundfish of the GOA Management Area August 2015 <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmfp.pdf>

² NPFMC Fishery Management Plan for Groundfish of the BSAI Management Area August 2015 <http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmfp.pdf>

Russian Fisheries and potential interaction with EBS flatfish stocks

Flatfish species can be found on both sides of the U.S.-Russia Federation line. Russian flatfish fisheries are managed by the setting of TACs. Catch totals from Russia waters, including the western Bering Sea, are well below the TAC limits. The flatfish fisheries on the Russian side of the Federation Line appear to be managed as part of a joint management system. NOAA and the Federal Agency for Fisheries of the Russian Federation signed a Joint Statement on Enhanced Fisheries Cooperation (April 29, 2013).³ This document identifies three major areas of future cooperation: 1) combating global Illegal Unreported and Unregulated (IUU) fishing; 2) collaborating on science and management of Arctic Ocean living marine resources; and 3) advancing conservation efforts in the Ross Sea region of Antarctica.

Gulf of Alaska flatfish fisheries and potential overlap with British Columbia stocks

In the Gulf of Alaska, the flatfish species here under assessment are caught in the Central and Western GOA. The Eastern Gulf of Alaska, bordering British Columbia (BC) at its southern tip, is completely closed to bottom trawling. Flatfish is therefore not caught in this area and potential issues of stock overlap and harvest between South-eastern Alaska and BC is likely not significant and buffered by this large, year round, area closure.

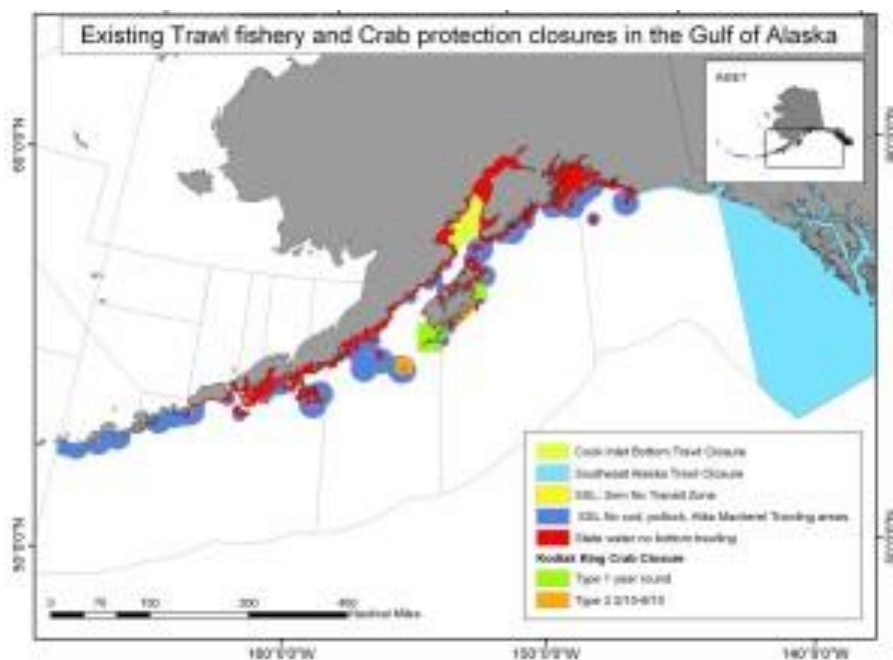


Figure 1.1 A year-round Southeast Alaska no trawl closure, which prohibits trawl fishing east of 140° W. was implemented in 1998.⁴

1.7 Review and Revision of conservation and management measures

C3 Council motion, September, 10, 2015

The purpose of motion C9 Bering Sea Canyons – NPFMC 2014 was to determine whether and how the Council should recommend amendment of the BSAI Groundfish and Crab FMPs to protect known,

³ Joint statement NOAA and the Federal Agency of Fisheries of the Russian Federation http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/statement_signed.pdf

⁴ NPFMC Area closures for GOA groundfish trawl and scallop fisheries <http://www.npfmc.org/crab-bycatch-overview/gulf-of-alaska-crab-bycatch/#CrabClosures>

significant concentrations of deep-sea corals in the Pribilof Canyon and the adjacent slope from fishing impacts under the appropriate authorities of the MSA. A sea slope and canyons survey was carried out and a report produced. The Council reviewed the scientific evidence and found that it does not suggest there is a risk to the deep-sea corals present under current management. In order to provide continued monitoring of the current coral communities in the Bering Sea canyons and slope, the Council also requests that AFSC report in the Ecosystem SAFE chapter: 1. Changes in coral frequency, composition and distribution in the trawl survey; 2. Changes in trawl and fixed gear effort in areas of model predicted coral abundance⁵.

C8 Council Motion Trawl Bycatch Management, Final Alternatives for the Council's October 11, 2015 Motion

The purpose of the proposed action is to create a new management structure which allocates prohibited species catch limits and/or allowable harvest to individuals, cooperatives, or other entities, which will mitigate the impacts of a derby-style race for fish. It is expected to improve stock conservation by creating vessel-level and/or cooperative-level incentives to eliminate wasteful fishing practices, provide mechanisms to control and reduce bycatch, and create accountability measures when utilizing PSC and/or target and secondary species. It will also increase at-sea monitoring in the GOA trawl fisheries, have the added benefit of reducing the incentive to fish during unsafe conditions, and improve operational efficiencies.⁶

1.8 Transparent management arrangements and decision making.

The NPFMC submits their recommendations/plans to the NMFS for review, approval, and implementation. NMFS makes recommendations available for public review and comment (partly by publication) before taking final action by issuing legally binding Federal regulations⁷.

1.9 Compliance with international conservation and management measures.

The US Coast Guard (USCG) is responsible for enforcing these FMPs at sea, in conjunction with NMFS enforcement ashore. Also, the USCG enforce laws to protect marine mammals and endangered species, international fisheries agreements (i.e. UN High Seas Driftnet Moratorium in the North Pacific), and foreign encroachment⁸.

⁵ NPFMC Bering Sea Canyons: <http://www.npfmc.org/bering-sea-canyons/>

⁶ NPFMC GOA Trawl ByCatch Management Motion <http://npfmc.legistar.com/gateway.aspx?M=F&ID=219d5719-7bd0-4aa6-b320-387efdba129f.pdf>

⁷ North Pacific Fisheries Management Council website. Accessed 2015: <http://www.npfmc.org/>

⁸ USCG. 2015. USCG District 17 Home page: <http://www.uscg.mil/d17/>

Fundamental 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.

No. Supporting clauses	16
Supporting clauses applicable	15
Supporting clauses not applicable	1
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence

2.1 Appropriate policy, legal and institutional framework adopted to achieve sustainable and integrated use of living marine resources.

The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes, a socio-economic and biological/environmental impact assessment of various proposed scenarios, before the path of action is decided. This occurs whenever resources under their management may be affected by other developments and each time they create, renew or amend regulations. 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 significant 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 can be accounted for.

The NEPA process consists of an evaluation of the environmental effects of a federal undertaking including its alternatives. There are three levels of analysis: categorical exclusion determination; preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and preparation of an environmental impact statement (EIS).

2.2/2.3/2.4 Representatives of the fisheries sector and fishing communities shall be consulted in the decision making processes involved in other activities related to coastal area management planning and development. Conflict avoidance and dissemination of management measures.

The state is a cooperating agency in the NEPA process for federal actions, giving the State of Alaska a seat at the table for federal actions. This includes decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users.

Overall, the NEPA process, existing agencies and processes (e.g. ADFG, the Alaska Department of Environmental Conservation, the Department of Natural Resources (DNR), US Fish and Wildlife Service, the Alaska National Interest Lands Conservation Act, the DNR's Office of Project Management and Permitting and Bureau of Ocean Energy Management), and the existing intimate and routine

cooperation between federal and state agencies managing Alaska's coastal resources (living and non-living) is capable of planning and managing coastal developments in a transparent, organized and sustainable way, that minimizes environmental issues while taking into account the socio-economic aspects, needs and interests of the various stakeholders of the coastal zone.

The NPFMC system was designed so that fisheries management decisions were made at the regional level to allow input from affected stakeholders assuring that the rights of coastal communities and their historic access to the fishery is included in the decision process. Council meetings are open, and public testimony - both written and oral - is taken on each and every issue prior to deliberations and final decisions. Public comments are also taken at all Advisory Panel and Scientific and Statistical Committee meetings. Each Council decision is made by recorded vote in public forum after public comment. Final decisions then go to NMFS for a second review, public comment, and final approval. Decisions must conform to the MSA, the NEPA, Endangered Species Act, Marine Mammal Protection Act, and other applicable law including several executive orders. The Council meets five times each year, usually in February, April, June, October and December, with three of the meetings held in Anchorage, one in a fishing community in Alaska and one either in Portland or Seattle. Most Council meetings take seven days, with the AP and SSC usually following the same agenda and meeting two days earlier.

The Alaska BOF and the NPFMC have signed a joint protocol agreement to help coordinate compatible and sustainable management of fisheries within each organization's jurisdiction. A committee was formed, the Joint Protocol Committee, which includes three members from each group. The entire board and council meet jointly once a year to consider proposals, committee recommendations, the analyses, and other topics of mutual concern. The joint meeting is typically held in Anchorage in February, depending upon council and board meeting schedules.

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

The Community Development Quota (CDQ) Program began in December of 1992 with the goal of promoting fisheries related economic development in western Alaska. The CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut and crab to eligible communities. The Program allocates 10% of the Pollock complex (yellowfin sole, northern rock sole, arrowtooth flounder, Greenland turbot, and flathead sole) BSAI TAC to eligible communities. The purpose of the program is to (i) provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the BSAI Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. There are 65 communities within a fifty-mile radius of the BS coastline who participate in the program. It was latest granted perpetuity status during the 1996 reauthorization of the MSA.

2.6/2.7 Research and monitoring of the coastal environment.

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

cooperation directive, and the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinating the review of large scale projects in the state of Alaska.

Fundamental 3

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

No. Supporting clauses	6
Supporting clauses applicable	6
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

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

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.

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

The GOA⁹ and BSAI¹⁰ Groundfish FMPs, under which flatfish in the federal waters of Alaska is managed, define nine management and policy objectives that are reviewed annually. These are:

- a. Prevent Overfishing,
- b. Promote Sustainable Fisheries and Communities,
- c. Preserve Food Webs,
- d. Manage Incidental Catch and Reduce Bycatch and Waste,
- e. Avoid Impacts to Seabirds and Marine Mammals,
- f. Reduce and Avoid Impacts to Habitat,
- g. Promote Equitable and Efficient Use of Fishery Resources,
- h. Increase Alaska Native Consultation,
- i. 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. Management measures detailed in the two Groundfish FMPs include quotas, allocated by region and by gear type; permit requirements, seasonal restrictions and closures,

⁹ Fishery Management Plan for Groundfish of the Gulf of Alaska. August 2015. NPFMC: <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf>

¹⁰ Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands. August 2015. NPFMC <http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>

geographical restrictions and closed areas, gear restrictions, prohibited species requirements, retention and utilization requirements, recordkeeping and reporting requirements, and observer requirements¹¹.

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 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.

B. Science and Stock Assessment Activities

Fundamental 4

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

No. Supporting clauses	14
Supporting clauses applicable	9
Supporting clauses not applicable	5
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

4.1. (Incl. 4.1.1., 4.1.2.) Reliable and accurate data required for assessing the status of fisheries and ecosystems - including data on retained catch of fish, bycatch, discards and waste shall be collected.

The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the flatfish fisheries and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents^{12,13} provide complete descriptions of data types and time series of the data collected and used in the stocks assessments, which are conducted annually, and used to determine stock status and harvest recommendations for BSAI and GOA flatfish. Full assessments for some of the 12 flatfish stocks considered in this report are done every year, while some assessments are conducted in full every second year, and updated in the interim years.

Age-Structured models are used to determine stock status and annual harvest recommendations for all the BSAI and GOA Flatfish in this review. All assessments use data collected from commercial landings and transshipment reports, port and at-sea observers; as well as sex, length and age data from fishery independent surveys in the EBS, the AI and the GOA. The Resource Assessment and Conservation Division (RACE) of the Alaskan Fisheries Science Center (AFSC) are responsible for federally managed

¹¹ State Management: 5 AAC 28.089 Guiding Principles for groundfish fishery regulations

<http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm>

¹² GOA SAFE 2015 <http://www.afsc.noaa.gov/REFM/Docs/2015/GOASafe.php>

¹³ BSAI SAFE 2015 <http://www.afsc.noaa.gov/REFM/Docs/2015/BSAISafe.php>

fisheries (3-200 nm) while the ADFG undertake coastal surveys and gather and collect data from state managed fisheries up to 3 nm from the coastline. The overall data collection for the Alaskan groundfish program is probably one of the most extensive in the world. At-sea, processor and catcher-processor vessels are legally required to report commercial and non-commercial catch data on a daily basis, while catch and auxiliary information from a very extensive observer program, in many cases covering 100% of the fleet activity (higher coverage rates in the EBS, significantly less in the GOA) is also transmitted on a daily basis.

Reporting of commercial catch from both state and federally managed fisheries is done through the Catch Accounting System (CAS), a multi-agency (NMFS, IPHC and ADFG) system that centrally collates landings data from shore based processing and landings operations as well as retained catch observations from individual vessels. The CAS system also provides a centralized data platform for the collation of catch (landings and discards) data from the extensive observer program. Catch and effort are recorded through the e-landing (electronic fish tickets) system and also collected by vessel captains in logbooks. Port landings are verified by shore-based observers, and estimates of discards and by-catch in the flatfish fisheries are compiled from fishing logbooks and at-sea observer data. Catch reports for flatfish in the BSAI¹⁴ and GOA¹⁵ Regions for 2015 can be found on the NMFS Alaskan fisheries website. Information on discards, by-catch and PSC is also reported, and can be found in the SAFE documents. Stock assessment authors¹⁶ have noted that there is some uncertainty with catches of northern and southern rock sole, given the similar appearance of the species and their overlap in catches in certain areas, but that the increase in observer data will be helpful in this regard.

Fishery independent data are collected in regular surveys of both the GOA and BSAI regions and used in the flatfish stock assessments. Extensive bottom trawl surveys are carried out by NMFS/RACE-AFSC annually in the EBS and in alternating years in the GOA and AI, and provide indices of abundance for groundfish species, including flatfish, as well as biological data. The size and age compositions are available from the surveys, although the age compositions from the current year surveys are not usually available in time to be included in the stock assessments of the same (current) year. A total of 376 survey stations are completed annually in the EBS survey, with tow duration of 30 minutes at a speed of 3 knots. The nominal survey abundance index is standardized with the area swept. The GOA survey follows the same methodology as the EBS survey, a random stratified survey design. The survey is biennial, with the NOAA survey schedule alternating each year between the GOA (done in 2015) and the AI (done in 2014) survey areas. For each survey year, about 800 stations are surveyed by three boats in the GOA, and about 420 stations are surveyed by two boats in the AI. For BSAI Greenland turbot, results from an AFSC trawl survey of the EBS slope area, as well as a longline survey conducted by AFSC - Auke Bay (EBS and AI in alternate years) are also used in the stock assessments. The EBS slope survey was last conducted in 2012, and as part of a biannual time series was scheduled to be done in 2014, but was rescheduled for 2016. Extensive oceanographic data on the GOA and BSAI are also collected both during the multispecies surveys and targeted oceanographic sampling. Diet analyses of potential predators on flatfish as well as of the diet of various sizes of the species have been undertaken. Extensive ecosystem reports containing a wide range of data, analyses, and

¹⁴ Bering Sea Aleutian Islands Catch Report:

https://alaskafisheries.noaa.gov/sites/default/files/reports/car110_bsai_with_cdq2015.pdf

¹⁵ Gulf of Alaska Catch Report:

https://alaskafisheries.noaa.gov/sites/default/files/reports/car110_goa2015.pdf

¹⁶ <http://www.afsc.noaa.gov/REFM/Docs/2015/GOAnrocksole.pdf>

indicators are included in the SAFE documents

The Fisheries Monitoring and Analysis Division (FMA) of the NMFS monitor groundfish fishing activities in the US EEZ. FMA is responsible for the biological sampling of commercial fishery catches, estimation of catch and bycatch mortality, and analysis of fishery-dependent survey data. The Division is responsible for training and oversight of at-sea observers who collect catch data onboard fishing vessels and at onshore processing plants. Data and analysis are provided to the Sustainable Fisheries Division of the Alaska Regional Office for the monitoring of quota uptake and for stock assessment, ecosystem investigations and research programs.

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

Beginning in 2013, Amendment 86 to the FMP of the BSAI and Amendment 76 to the FMP of the GOA established the new North Pacific Groundfish and Halibut Observer Program (NPGOP). All vessels fishing for groundfish in federal waters are required to carry observers, at their own expense, for at least a portion of their fishing time. These changes were intended to increase the statistical reliability of data collected by the program, address cost inequality among fishery participants, and expand observer coverage to previously unobserved fisheries. An important change in sampling methodology under the new observer program was to sample trawl vessels under 60 ft and greater than 40 ft, which had never been sampled prior to the restructured program. In 2015, the move of vessels to the trip selection pool increased observer deployment on vessels under 60 feet in length overall that participate in Western GOA non-pollock groundfish fisheries within the Non-Rockfish Program Catcher Vessel Sector. This included vessels fishing for flatfish in GOA, and NMFS believes the change has improved observer data by better representing fishing events.

Data gathered in the NPGOP cover all biological information from commercial fisheries, including catch weights (landings and discards), catch demographics (species composition, length, sex and age) and interactions with species such as sharks, rays, seabirds, marine mammals and other species with limited or no commercial value. As well as providing data for stock assessment and other scientific purposes, the observer program is also used extensively in- and post-season management. Daily reports are electronically transmitted via the CAS system. This 'real-time' data is used as the basis to trigger area as well as fisheries closures e.g. if maximum catch allocations of target or Prohibited Species (such as chinook salmon) are caught. Financing of the NPGOP is based on cost recovery where individual vessel operators must pay the daily observer costs as a condition of licence. Annual reports¹⁷ from the Observer Program contain detailed information on fees and budgets, deployment performance, enforcement, and outreach. NMFS envisions that future reporting will expand key performance metrics to improve understanding of the Observer Program performance. NMFS has already noted progress on incorporating variances associated with catch estimates, and will continue to report as work progresses.

In BSAI, close to 100% of flatfish catch was covered by observers in 2014¹⁸. In GOA, over 95% of the total flatfish catch by catcher/processor vessels was observed in 2014, although the percentage was much lower for catcher vessels at 11%. As noted above, measures were adopted by NMFS in 2015 to improve

¹⁷ NMFS (National Marine Fisheries Service). 2015. North Pacific Groundfish and Halibut Observer Program 2014 Annual Report. <https://alaskafisheries.noaa.gov/fisheries/observer-program-reports>

¹⁸ Ibid.

this level of coverage. Sampling of catches by observers for presence of PSC, including Chinook salmon, is an important function, and this came into play in 2015, when the non-rockfish trawl fishery by catcher vessels in Central and Western GOA was closed from May to August due to excessive by-catches of Chinook, based on observer sampling.

NMFS and the NPFMC have developed an Electronic Monitoring (EM) Strategic Plan to integrate video monitoring into the Observer Program to improve data collection. The NMFS Policy on Electronic Monitoring Technologies and Fishery Dependent Data Collection provides guidance on the adoption of electronic technology solutions in fishery-dependent data collection programs. Electronic technologies include the use of vessel monitoring systems (VMS), electronic logbooks, video cameras for electronic monitoring (EM), and other technologies that provide EM and electronic reporting (ER). The policy also includes guidance on the funding for electronic technology use in fishery-dependent data collection programs. At-sea work has proceeded under this initiative in 2014 and 2015.

4.3. (Incl. 4.3.1.) Sufficient knowledge of social, economic and institutional factors relevant to the fishery in question shall be developed through data gathering, analysis and research.

4.4. States shall stimulate the research required to support national policies related to fish as food.

4.5. States shall ensure that the economic, social, marketing and institutional aspects of fisheries are adequately researched and that comparable data are generated for ongoing monitoring, analysis and policy formulation.

With respect to socio-economic data collection, economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC's Economic and Social Sciences Research Program (in the REFM Division) produces an annual Economic Status Report¹⁹ of the Groundfish fisheries in Alaska. This comprehensive report provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, including flatfish, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market.

Agencies such as NPFMC are required to consider the impact of their rules (e.g. Fishery Management Plans, Fishing Regulations) on small entities (fishermen communities) and to evaluate alternatives that would accomplish the objectives of the rule(s) without unduly burdening small entities when the rules impose a significant economic impact on them.

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

The NPFMC established a Rural Outreach Committee in 2009 to improve outreach and communications

¹⁹ Fissel, et. al., (2015). <http://www.afsc.noaa.gov/refm/docs/2015/economic.pdf>
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with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions²⁰. The Committee is to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; to provide feedback on community impacts sections of specific analyses, if requested; and to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. Priorities of the Committee included salmon PSC reduction in EBS and GOA.

Fundamental 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.

No. Supporting clauses	11
Supporting clauses applicable	10
Supporting clauses not applicable	1
Overall level of conformity	HIGH
Non Conformances	0

Summarized Evidence:

5.1. (Incl. 5.1.1.) States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. The research shall be disseminated accordingly. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the Alaska Fisheries Science Center (AFSC), which operates several laboratories and Divisions. The Auke Bay Laboratories²¹ conduct scientific research on fish stocks, fish habitats, and the chemistry of marine environments. The National Marine Mammal Laboratory conducts research on marine mammals, with particular attention to issues related to marine mammals off the north Pacific coasts including Alaska.

The Fisheries Monitoring and Analysis Division (FMA) monitors groundfish fishing activities in the US EEZ off Alaska and conducts research associated with sampling commercial fishery catches, estimation of catch and bycatch mortality, and analysis of fishery-dependent data. The Resource Assessment and Engineering Division (RACE) conducts fishery surveys to measure the distribution and abundance of approximately 40 commercially important fish and crab stocks. The Resource Ecology and Fisheries Management Division (REFM) collects data to support management of Northeast Pacific and eastern Bering Sea fish and crab resources, including flatfish. REFM also produces of an annual Economic Status Report, referred to under clause 4.5 above.

²⁰ NPFMC. Rural Outreach Committee <http://www.npfmc.org/committees/rural-outreach-committee/>

²¹ Auke Bay Laboratories <http://www.afsc.noaa.gov/ABL/default.php>

The North Pacific Research Board (NPRB)²² was created in 1997 to conduct research activities relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean with a priority on cooperative research efforts designed to address pressing fishery management or marine ecosystem information needs. The NPRB has developed two Integrated Ecosystem Research Programs relevant to the GOA and BSAI²³. These are extensive multi-year projects involving tens of millions of dollars and scientists from a number of institutions, and are described more fully in Section F (13) below.

Formed in 1998, the North Pacific Fisheries Research Foundation (NPFRRF) was established by participants of the Bering Sea groundfish trawl fishery to fund, direct, and otherwise oversee applied scientific research regarding the fisheries and fishery resources of the North Pacific, in the interest of the commercial fishing industry. They have done recent work on salmon excluder devices for midwater trawl fisheries²⁴.

5.2. (Incl. 5.2.1.) The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration shall be monitored.

Peer reviewed stock assessments are done annually and used as the scientific basis to set catch quotas. Scientists also evaluate how fish stocks and user groups might be affected by fishery management actions. The assessments take into account uncertainty and evaluate stock status relative to reference points in a probabilistic way. The *Stock Assessment and Fishery Evaluation (SAFE)* reports (see Section 4 above for details and references to the 2015 flatfish SAFE documents) are compiled annually by the BSAI and GOA Groundfish Plan teams, which are appointed by the Council. The sections are authored by AFSC and State of Alaska scientists and the assessments first undergo internal peer review. The assessments as well as the plan team recommendations are then subsequently reviewed by the SSC who make the final OFL and ABC recommendations to the NPFMC. The SSC may modify the recommendations from the Plan Team based upon additional considerations. The Council sets TACs at or below the ABC recommendations of the SSC. The SAFE reports also include a volume assessing the Economic Status of the Groundfish Fisheries off Alaska as well as a volume on Ecosystem Considerations. The SAFE report provides information on the historical catch trend, estimates of the maximum sustainable yield of the groundfish complex as well as its component species groups, assessments on the stock condition of individual species groups; assessments of the impacts on the ecosystem of harvesting the groundfish complex at the current levels given the assessed condition of stocks, including consideration of rebuilding depressed stocks as necessary; and alternative harvest strategies and related effects on the component species groups.

In 2015, full peer-reviewed assessments were conducted for the five GOA flatfish stocks considered here, as well as for yellowfin sole, northern rock sole, and Greenland turbot in BSAI. For the four other BSAI flatfish covered by this report, the last full assessments were in 2014²⁵, with updates (including projections) provided in 2015. The SAFE documents referenced in Section 4.1 above contain the full suite of results for all the 2015 flatfish stock assessments and updates.

The AFSC periodically requests a more comprehensive review of groundfish stock assessments by

²² North Pacific Research Board <http://www.nprb.org/>

²³ NPRB) - Bering Sea Project <http://www.nprb.org/bering-sea-project>

²⁴ North Pacific Fisheries Research Foundation (NPFRRF) <http://www.npfrf.org/>

²⁵ 2014 SAFE http://www.afsc.noaa.gov/refm/stocks/2014_assessments.htm

the Center of Independent Experts (CIE). These reviews are intended to lay a broader groundwork for improving the stock assessments outside the annual assessment cycle. The most recent CIE reviews of Alaskan flatfish assessments have been those conducted in 2012 for BSAI yellowfin sole, GOA northern and southern rock sole, and GOA rex sole. Results of these reviews are available on the NMFS/CIE website.²⁶ Recommendations from these reviews have been addressed where possible during subsequent stock assessments.

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

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

The United States and Russian Federation maintain the bilateral Intergovernmental Consultative Committee (ICC) fisheries forum pursuant to the US-Soviet Comprehensive Fisheries Agreement, signed on May 31, 1988. These meetings have resulted in US vessels doing joint surveys with Russian Federation scientists in the Federation's zone of the Bering Sea. During 1984 and 1987, USA-Japan joint trawl surveys were conducted in GOA²⁷.

5.5. (Incl. 5.5.1. and 5.5.2.) Data generated by research shall be analysed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

Data collected by scientists from the many surveys and flatfish fisheries are analysed and presented in peer reviewed meetings and/or in primary literature, following rigorous scientific protocols. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on NMFS, ADFG, and NPFMC websites, in order to contribute to fisheries conservation and management. Confidentiality of individuals or individual vessels (e.g. in the analysis of fishery CPUE data) is fully respected where necessary.

5.6. Studies shall be promoted which provide an understanding of the costs, benefits and effects of alternative management options designed to rationalize fishing, in particular, options relating to excess fishing capacity and excessive levels of fishing effort.

5.7. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.

As noted in Section A2 above, the Western Alaska Community Development Quota (CDQ) Program²⁸ was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. The CDQ Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to (i) provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) support economic development in western Alaska; (iii) alleviate poverty and provide economic and social benefits for residents of western

²⁶ CIE reviews <https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2012>

²⁷ Munro and Hoff, 1995. <https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-50.pdf>

²⁸ NPFMC Community Development Quota Program <http://www.npfmc.org/community-development-program/>

Alaska; and (iv) achieve sustainable and diversified local economies in western Alaska. The Program allocates 10.7% of the BSAI TAC for the flatfish complex (yellowfin sole, northern rock sole, arrowtooth flounder, Greenland turbot, and flathead sole) to eligible communities.

Most of the flatfish resources in this report are characterized by large biomasses and relatively light exploitation. They are well managed, and none are overfished. An important consideration in the 2015 flatfish fishery for some vessels in GOA was a closure due to PSC limits for Chinook salmon, which had considerable economic impact. This is discussed in more detail later in this report.

C. The Precautionary Approach

Fundamental 6

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

No. Supporting clauses	5
Supporting clauses applicable	5
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized Evidence:

6.1. (Incl. 6.1.1., 6.1.2., 6.1.3., 6.1.4., 6.1.5.) States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded.

National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. The status of US fish stocks is determined by 2 metrics. The first is the relationship between the actual exploitation level and the overfishing level (OFL). If the exploitation level (or fishing mortality) exceeds the FOFL, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the minimum stock size threshold (MSST). If the stock size is below the MSST it is considered to be overfished.

A stock is considered to be approaching an overfished condition when it is projected that there is more than a 50 percent chance that the biomass of the stock or stock complex will decline below the MSST within two years. The BSAI and GOA groundfish fishery management plans²⁹ have pre-defined harvest control rules that define a series of target and limit reference points for flatfish and other groundfish covered by these plans. Each SAFE report describes the current fishing mortality rate, stock biomass relative to the target and limit reference points. Both management plans specify the Overfishing Limits (OFL) and the Fishing mortality rate (FOFL) used to set OFL, Acceptable Biological Catch (ABC) and

²⁹ North Pacific Fisheries Management Council Fisheries Management Plans <http://www.npfmc.org/fishery-management-plans/>
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the fishing mortality rate (FABC) used to set ABC, the determination of each being dependent on the knowledge base for each stock. The overall objectives of the management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty.

The NPFMC management plan classifies each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. Typically, the harvest control rules become more precautionary as tier classification increases. Catch options are adjusted depending on the status of stocks relative to Bmsy or, where Bmsy is not available, to the biomass corresponding to the percentage of the equilibrium spawning biomass that would be obtained in the absence of fishing (expressed, for example, as B35%, B40%, etc.). The harvest control rules account for scientific uncertainty, and contain explicit values for FOFL and maxFABC values in each tier.

For Tier 1 stocks, reliable estimates are available for B and BMSY, along with a probability density function for FMSY. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence, and the MSY proxy level is defined as B35%. Stocks in tiers 1-3 are further categorized as (a), (b), or (c) based on the relationship between B and either BMSY or B40%, with (a) indicating a stock where biomass is above BMSY or B40%, (b) indicating a stock where biomass is below BMSY or B40% but above MSST (e.g. 0.5 x BMSY proxy), and (c) indicating a stock where biomass is below MSST. The category assigned to a stock determines the method used to calculate ABC and OFL.

Each assessment for the flatfish stocks considered here contains a detailed summary table with precautionary reference points listed, as well as the stock biomass relative to these values, and if how the values have changed since the previous assessment. The following table, from the 2015 GOA Arrowtooth flounder assessment³⁰, gives an example of how the PA information is presented for each stock in the SAFE documents. Projected 2016 stock biomass was actually above B100% in this case (Tier 3a stock), the stock is not overfished, and no overfishing is occurring.

³⁰ Spies et al, in 2015 GOA SAFE <http://www.afsc.noaa.gov/REFM/Docs/2015/GOASafe.php>
Form 11b

Quantity	As estimated or specified last year for:		*As estimated or recommended this year for:	
	2015	2016	2016	2017
<i>M</i> (natural mortality rate)**	0.35, 0.2	0.35, 0.2	0.35, 0.2	0.35, 0.2
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	1,957,970	1,915,170		
Projected total (age 1+) biomass (t)			2,103,860	2,083,450
Projected Female spawning				
<i>B</i> _{100%}	1,189,120	1,147,450	1,175,240	1,157,520
<i>B</i> _{40%}	1,155,170	1,155,170	992,272	992,272
<i>B</i> _{35%}	462,067	462,067	396,909	396,909
<i>B</i> _{35%}	404,309	404,309	347,295	347,295
<i>F</i> _{OFL}	0.204	0.204	0.204	0.204
<i>maxF</i> _{ABC}	0.172	0.172	0.171	0.171
<i>F</i> _{ABC}	0.172	0.172	0.171	0.171
OFL (t)	226,390	217,522	219,430	196,714
maxABC (t)	192,921	185,352	186,188	189,332
ABC (t)	192,921	185,352	186,188	189,332
Status	As determined last year for:		As determined this year for:	
	2013	2014	2014	2015
Overfishing		n/a		n/a
Overfished	n/a		n/a	
Approaching overfished	n/a		n/a	

*Projections are based on estimated catches of 20,324 t for 2015 and 2016.

**Natural mortality rate is 0.35 for males, 0.2 for females.

Tables 6.1 and 6.2 show the updated reference points and biomass estimates, from the 2015 SAFE documents, for the GOA and BSAI flatfish stocks in this report. Four of the five GOA stocks are in Tier 3a, and are therefore above the B40% values (most by at least double). For the BSAI, there are 4 stocks in Tier 3a, one (Greenland turbot) in Tier 3B, and two in Tier 1a. With the exception of Greenland turbot, all the BSAI stocks in the table are above Bmsy or its proxy (B35%). Greenland turbot has shown some recent improvement in recruitment and stock size, and biomass in 2016 is estimated to be above MSST (B17.5%), but below B40%, thus placing it in tier 3b. None of the twelve stocks are considered to be overfished, undergoing overfishing, or approaching an overfished condition. By comparing the last two columns in the tables, it is obvious that the stocks are currently being fished well below the OFL in all cases.

Table 6.1. Reference points for flatfish stocks in the Gulf of Alaska. Biomass and catch are in tons. Catches in last column are either to mid/late October, 2015, or projected (estimated by assessment authors) to the end of 2015. Catches for rock sole include both species (northern + southern*). All data are from the 2015 GOA SAFE³¹, including Biomass estimates for 2016 from the most recent assessment or update.

GOA Stock/Unit	Tier	Year	Biomass	BMSY	B35%	B40%	B100%	FOFL	FABC	OFL	Catch (2015)
Arrowtooth flndr	3a	2016	1,175,240	N/A	347,295	396,909	992,272	0.204	0.171	219,430	20,324
Flathead sole	3a	2016	82,375	N/A	32,258	36,866	92,165	0.40	0.32	42,840	1,982
Northern rock sole	3a	2016	35,600	N/A	18,100	20,700	51,800	0.299	0.248	14,000	2,176*
Southern rock sole	3a	2016	74,000	N/A	32,700	37,400	93,500	0.222	0.186	22,700	
Rex sole	5	2016	43,808	N/A	19,896	22,738	56,845	0.17	0.128	9,791	1,678

Table 6.2. Reference points for flatfish stocks in the Bering Sea and Aleutian Islands. Biomass and catch are in tons. Catches in last column are either to October, 2015, or projected (estimated by assessment authors) to the end of 2015. All data from the 2015 BSAI SAFE³² including Biomass estimates for 2016 from the most recent assessment or update.

BSAI Stock/Unit	Tier	Year	Biomass	BMSY	B35%	B40%	B100% or B0*	FOFL	FABC	OFL	Catch (2015)
Alaska plaice	3a	2016	204,600	N/A	120,800	138,100	345,100	0.175	0.143	49,000	13,000
Arrowtooth flndr	3a	2016	535,350	N/A	194,267	222,019	555,049	0.180	0.153	94,035	13,710
Flathead sole	3a	2016	240,427	N/A	111,722	127,682	319,206	0.35	0.28	79,562	11,188
Greenland turbot	3b	2016	31,028	N/A	44,255	50,577	126,441	0.10	0.08	4,194	2,194
Kamchatka flndr	3a	2016	61,700	N/A	46,400	53,000	132,500	0.076	0.065	11,100	4,858
North. rock sole	1a	2016	584,400	265,000	N/A	N/A	682,800*	0.152	0.148	165,900	46,675
Yellowfin sole	1a	2016	702,200	435,000	N/A	N/A	1,107,000*	0.105	0.098	228,100	122,000

Another limit reference point used in managing groundfish in the BSAI and GOA is the optimum yield (OY). The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within a given range. The range for BSAI is 1.4 to 2.0 million mt; 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, and was an important consideration for NPFMC in determining catch limits for the 2016 fisheries, as the sum of TACs in the

³¹ <http://www.afsc.noaa.gov/REFM/Docs/2015/GOASafe.php>

³² <http://www.afsc.noaa.gov/REFM/Docs/2015/BSAISafe.php>

BSAI area is at or near the OY limit of 2 million tons.

Fundamental 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.

No. Supporting clauses	6
Supporting clauses applicable	6
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized Evidence:

7.1. (Incl. 7.1.1.) The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment.

7.2. (Incl. 7.2.1., 7.2.2., 7.2.3.) For new and exploratory fisheries, procedures shall be in place for promptly applying precautionary management measures, including catch or effort limits.

The MSA, as amended, sets out ten national standards for fishery conservation and management, with national standard 1 of the MSA requiring that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. The BSAI and GOA Groundfish FMPs³³ are clearly consistent with MSA requirements in applying the Precautionary Approach (PA) to fisheries. The FAO Guidelines for the PA advocate a comprehensive management process that includes data collection, monitoring, research, enforcement, and review, prior identification of desirable (target) and undesirable (limit) outcomes, and measures in place to avoid and correct undesirable outcomes, the action to be taken when specified deviations from operational targets are observed and an effective management plan. Lastly, the FAO guidelines advocate that the absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species as well as non-target species and their environment. The overall management regime for flatfish Alaska is comprehensive, the available scientific data, analyses, and peer-review are substantial, and take into account uncertainty whenever possible. Stocks tend to be lightly exploited in recent years at biomass levels well above the limit reference points, and well defined harvest control rules are in place that are consistent with the harvest strategy, and ensure that the exploitation rate is reduced as limit reference points are approached. In addition, ecosystem considerations are taken into account, and there is an overall limit (OY) constraining the total TACs for all fisheries. As detailed in the previous sections of this report, all the elements as specified above in the FAO guidelines for the PA are present.

³³ <http://www.npfmc.org/fishery-management-plans/>

D. Management Measures

Fundamental 8

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

No. Supporting clauses	10
Supporting clauses applicable	10
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

Management measures:

8.1. (Incl 8.1.1.) Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.

National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and NPFMC follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal flatfish fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations (e.g. the OY limits). The objectives are spelled out clearly in modern FMPs for BSAI and GOA Regions, and both FMPs contain long-term management objectives for the Alaska groundfish fishery.

Management measures in the FMPs include (i) permit and participation, (ii) authorized gear, (iii) time and area, and catch restrictions, (iv) measures that allow flexible management authority, (v) designated monitoring and reporting requirements for the fisheries, and (vi) schedule and procedures for review of the FMP or FMP component. For every change/amendment or new development affecting fisheries management and therefore modifying the FMPs, there is an evaluation of alternative conservation and management measures, including considerations of their cost effectiveness and social impact.

There is a rigorous peer-reviewed scientific stock assessment process, which accounts for uncertainty, upon which the annual management (ABC) advice and TAC is based. Ecosystem considerations are part of all stock assessments. Based on the 2014-15 stock assessments, none of the flatfish stocks in Alaskan federal or state waters considered in this report are overfished, or are undergoing overfishing. There are regulations to protect Steller sea lions (SSL) and red king crabs, and to avoid seabirds, corals, and seamounts. By-catches of all species including PSC are carefully managed and fisheries are closely monitored by extensive observer coverage, dockside checks, and Federal and State enforcement agencies.

No destructive fishing practices are employed, and the only gears allowed to direct for flatfish in Alaskan

waters are longline and non-pelagic trawl gear modified to reduce the potential impact on bottom habitat. Sweep line modifications to trawl gear have been implemented to 1) decrease significantly habitat interaction of trawl gear and 2) reduce the bycatch of crabs, and mortality rates of crabs that slip under the gear without being caught. Longline gear is regulated for seabird avoidance measures.

8.2. (Incl 8.2.1.) States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery.

Organisations and individuals involved in the fishery and management process have been identified. The Alaska flatfish management process has many stakeholders, including Alaska flatfish license holders, processors, fishermen's organizations, the state of Alaska, indigenous people, CDQ groups, and environmental groups. Roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. The NPFMC process is the primary means for soliciting stakeholder information important to these fisheries, and this is fully transparent and open to the public. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. Fishing industry stakeholders work extensively with fishery scientists, managers, and other industry members on various initiatives to ensure sustainability of the flatfish fisheries. The NPFMC's CDQ Program and Rural Outreach Committee (see Section 4.6 above) also ensure community participation in fishery management actions.

8.3. (Incl 8.3.1.) Fleet capacity operating in the fishery shall be measured. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

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. As noted above in Section 4.5, AFSC's Economic and Social Sciences Research produces an annual Economic Status Report³⁴ of the Groundfish fisheries in Alaska, which includes estimates of catches, values of catch and resulting food products, and the number and sizes of vessels that participate in the groundfish fisheries off Alaska. There are substantial effort controls and records of all fishing operations in the Alaskan fisheries through mechanisms such as the NPFMC Licence Limitation Program, and the Restricted Access Management Program administered by NMFS Alaska Regional Office. The Alaska Commercial Fisheries Entry Commission (CFEC) issues state waters permits and vessel licenses to qualified individuals.

8.4. (Incl 8.4.1., 8.4.2., 8.4.3) States and relevant groups from the fishing industry shall encourage the development and implementation of technologies and operational methods that reduce waste and discards of the target species. These measures shall be applied appropriately.

There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the flatfish fisheries. These include measures to address fish size, discards, and various closed seasons and areas. Specific examples include the modifications to trawl sweep lines, and year-round closures of large areas and conservation zones to protect numerous species such as red king crab and chum salmon. Under NPFMC regulations, Pacific halibut, Pacific herring, Pacific salmon and steelhead, king crab, and Tanner crab are prohibited species and must be avoided while fishing for

³⁴ <http://www.afsc.noaa.gov/refm/docs/2015/economic.pdf>

groundfish and must be returned to the sea with a minimum of injury except when their retention is required or authorized by other applicable law.

AFSC collaborated with the Bering Sea bottom trawl fleet to identify modifications of trawl gear that would reduce damage to seafloor habitat. Research focused on the sweeps, cables that connect the doors to the net, which cover the vast majority of the area affected by bottom trawling for flatfish. Using devices to elevate sweeps 2-4 inches above the seafloor reduced effects on living structure animals on sand/mud substrates, while maintaining effective herding and capture of groundfish. The modification was also shown to substantially reduce mortality rates of several crab species encountered by trawl sweeps³⁵. These modifications were adopted by NPFMC in 2009 for subsequent use by trawlers targeting flatfish in the Bering Sea, and Central GOA.

At present, NPFMC is considering a number of measures to reduce by-catch, wastage, and PSC in Alaskan trawl fisheries. These are intended to “increase the ability of the groundfish trawl sector to avoid PSC species and utilize available amounts of PSC more efficiently by allowing groundfish trawl vessels to fish more slowly, strategically, and cooperatively, both amongst the vessels themselves and with shore-based processors”, and to “reduce bycatch and regulatory discards by groundfish trawl vessels”³⁶. For all flatfish fisheries considered here, discards are managed and included in the reporting scheme for the fisheries.

Fundamental 9

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

No. Supporting clauses	11
Supporting clauses applicable	8
Supporting clauses not applicable	3
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

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

As noted in previous sections, the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. NMFS and NPFMC follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal flatfish fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations. Management measures are in place to ensure sustainability, and to allow timely rebuilding if stocks are overfished. None of the flatfish stocks considered

³⁵ EFH 2010 Summary Report https://alaskafisheries.noaa.gov/sites/default/files/efh_5yr_review_sumrpt.pdf

³⁶ NPFMC GOA Trawl by-catch management

<http://npfmc.legistar.com/gateway.aspx?M=F&ID=efc97cbc-744b-4738-92e6-b06b4e19ca05.pdf>

in this report are classified as overfished or undergoing overfishing, and are not in a depleted state. Only groundfish trawls and longlines are used in the fisheries and no destructive fishing practices are allowed which would adversely impact habitat.

The Environmental Impact Statement on Essential Fish Habitat (EFH) conducted in 2005³⁷ (and reviewed in 2010) indicated that fishing has long-term effects on benthic habitat features off Alaska and acknowledges that considerable scientific uncertainty remains regarding the consequences of such habitat changes for the sustained productivity of managed species. However, this EIS also concluded “that the effects on EFH are minimal because the analysis finds no indication that continued fishing activities at the current rate and intensity would alter the capacity of EFH to support healthy populations of managed species over the long term”. The analysis concludes that no NPFMC managed fishing activities have more than minimal and temporary adverse effects on EFH, which is the regulatory standard requiring action to minimize adverse effects under the Magnuson-Stevens Act. These findings suggested that no additional actions were required to minimize the adverse effects of fishing on EFH pursuant to the Magnuson-Stevens Act and the EFH regulations. It was noted that the analysis has many limitations, and the effects of fishing on EFH for some managed species are unknown.

9.2. When deciding on use, conservation and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood.

Through extensive consultation processes and direct involvement in the management of the flatfish stocks, interests of indigenous people and local fishing communities in Alaska are recognized. The Western Alaska Community Development Quota (CDQ) Program was created by NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. Also, as noted in Section 4.6 above, NPFMC has established a Rural Outreach Committee to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. Management actions taken to reduce salmon by-catches also explicitly acknowledge the importance of the salmon resources to the individuals and communities reliant on them.

9.3. States and relevant groups from the fishing industry shall encourage the development and implementation of technologies and operational methods that reduce discards of the target and non-target species catch. The use of fishing gear and practices that lead to the discarding of catch shall be discouraged and the use of fishing gear and practices that increase survival rates of escaping fish shall be promoted.

Discarding of flatfish does occur in some other directed fisheries, and there are by-catches in the flatfish fisheries, including prohibited species (PSC). For some species, such as arrowtooth flounder in GOA, the flatfish species of interest is taken primarily as bycatch in other fisheries, or in a mixed fishery. The PSC includes halibut and Chinook salmon, and in 2015 the non-rockfish program catcher vessels exceeded the

³⁷ EIS 2005 Summary, conclusions

https://alaskafisheries.noaa.gov/sites/default/files/0405efh_eis_Chapter_4.5.pdf

2700 Chinook limit by 174 fish³⁸ before May, resulting in closures of fisheries³⁹ affecting primarily P. cod and flatfish in Central and Western GOA. Following a Regulatory Impact Review by NMFS⁴⁰, the fisheries reopened in August, under a PSC limit of 1600 Chinook set by NPFMC, and NMFS data indicates only 4 fish of this limit were caught through the end of the fishery, Dec. 31, 2015⁴¹. The majority of chinook by-catch in GOA is from the pollock fishery, and a recent supplementary Biological Opinion concluded that groundfish fisheries, including flatfish, in the GOA were not likely to jeopardize the continued existence of threatened Chinook stocks⁴² (NMFS 2012). NPFMC considered several proposals to address the ongoing issue of Chinook by-catch management at its December, 2015 meeting, including re-apportionment strategies. Various measures to reduce by-catches of PSC species (crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted by NPFMC in recent years⁴³. Other measures taken by flatfish fishing vessels to reduce halibut catch include use of excluder devices, improved communication and data sharing among vessels to avoid halibut, and enhanced deck sorting to reduce mortality of halibut returned to the sea. Data from the Observer Program enables enforcement of bycatch quotas for the species that by regulation have to be discarded at sea.

9.4. Technologies, materials and operational methods shall be applied to minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear.

No fixed net gears (e.g. gillnets) are permitted, by regulation, in the federal and state flatfish fisheries in Alaska, and thus there is no ghost fishing from these forms of fishing gear. As well, there is minimal gear loss in flatfish trawl fisheries that could result in ghost fishing. For the flatfish considered here, directed longline fishing is conducted only for Greenland turbot, a relatively small portion of the overall flatfish catch. Modified (elevated) sweep lines reduce bottom contact of flatfish trawls used in the Alaskan fisheries.

9.5. There shall be a requirement that fishing gear, methods and practices where practicable, are sufficiently selective as to minimize waste, discards, and catch of non-target species - both fish and non-fish species and impacts on associated or dependent species.

- 9.6 The intent of fishing selectivity and fishing impacts related regulations shall not be circumvented by technical devices and information on new developments and requirements shall be made available to all fishers.

- 9.7 International cooperation shall be encouraged with respect to research programs for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology.

- 9.8 States and relevant institutions involved in the fishery shall collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behaviour of target and non-target species in relation to such fishing gear as an aid for management

³⁸ NMFS Chinook data 2015

https://alaskafisheries.noaa.gov/sites/default/files/reports/car142_goa_salmon2015.pdf

³⁹ NOAA notice of fishery closure. <https://alaskafisheries.noaa.gov/node/28259>

⁴⁰ NMFS RIR <https://alaskafisheries.noaa.gov/sites/default/files/analyses/goatrawl-chinookpsc-rir0715.pdf>

⁴¹ NMFS Chinook data 2015

https://alaskafisheries.noaa.gov/sites/default/files/reports/car142_goa_salmon2015.pdf

⁴² NMFS 2012. Supplemental Biological Opinion on the Re-initiation of the Endangered Species Act Section 7

Consultation on Incidental Catches of Chinook Salmon in the Gulf of Alaska Fisheries. Jan 9, 2012, NOAA, Seattle WA

⁴³ <http://www.npfmc.org/wp-content/PDFdocuments/bycat>

decisions and with a view to minimizing non utilized catches.

As noted in Section 8.4 above, AFSC has collaborated with the Alaskan bottom trawl fleet to identify modifications of trawl gear that reduce damage to seafloor habitat. Elevated sweeps operating 2-4 inches above the seafloor reduce effects on softer sea bottoms, and reduce mortality rates of several crab species encountered by trawl sweeps. These modifications are required by regulation for vessels targeting flatfish in the Bering Sea and Central GOA. As well there are several regulations in place addressing seabird avoidance for vessels fishing with hook-and-line gear. Measures taken/adopted to reduce various by-catch species, including PSC, are discussed in Section 9.3 above.

Fundamental 10

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

No. Supporting clauses	3
Supporting clauses applicable	3
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

10.1/10.2/10.3 Education and training programmes.

The North Pacific Fishing Vessel Owners association (NPFVO)⁴⁴ provides a large and diverse training program that many of the professional crew members must pass. Training ranges from firefighting on a vessel, damage control, man-overboard, MARPOL, etc., and The Sitka-based Alaska Marine Safety Education Association alone has trained more than 10,000 fishermen in marine safety and survival through a Coast Guard-required class on emergency drills. 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 Center⁴⁵.

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, & Watch keeping). In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Also, the University of Alaska Sea Grant Marine Advisory Program (MAP)⁴⁶ provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. MAP also conducts sessions of their Alaska Young Fishermen's Summit. Each Summit is an intense course in all aspects of Alaska fisheries, from fisheries management & regulation (e.g. MSA), to seafood marketing. The 2016 summit

⁴⁴The North Pacific Fishing Vessel Owners association <http://www.npfvoa.org/>

⁴⁵ Alaska's Institute of Technology <http://www.avtec.edu/amtc-cost.aspx>

⁴⁶ University of Alaska Sea Grant Marine Advisory Program (MAP) <http://seagrant.uaf.edu/map/fisheries/>

was hosted in Juneau, Alaska, from January 27-29th 2016. The conference aimed at providing crucial training and networking opportunities for fishermen entering the business or wishing to take a leadership role in their industry⁴⁷.

In addition to this, MAP provides training and technical assistance to fishermen and seafood processors in Western Alaska. A number of training courses and workshops were developed in cooperation with local communities and CDQ groups. Additional education is provided by the Fishery Industrial Technology Center, in Kodiak, Alaska⁴⁸.

E. Implementation, Monitoring and Control

Fundamental 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.

No. Supporting clauses	6
Supporting clauses applicable	3
Supporting clauses not applicable	3
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

11.1 Enforcement agencies and framework:

Effective mechanisms are established for fisheries monitoring, surveillance, control and enforcement measures including, an observer program (although it is designed for biological data collection rather than enforcement), inspection schemes such as US Coast Guard (USCG)⁴⁹ boardings, dockside landing inspections and vessel monitoring systems, to ensure compliance with the conservation and management measures for the Alaska Flatfish fisheries.

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

On January 8, 2002, an emergency interim rule (67 FR 956) was issued by NMFS to implement Steller sea lion protection measures. Vessels that catch flatfish also catch Pacific cod since it found in similar fishing grounds and they have quota for it. All vessels using pot, hook-and-line or trawl gear in the directed

⁴⁷ Alaska Young Fishermen's Summit: <https://seagrant.uaf.edu/map/workshops/2016/ayfs/>

⁴⁸ Fishery Industrial Technology Center <http://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/>

⁴⁹ US Coast Guard: <http://www.uscg.mil/>

⁵⁰ NOAA Office of Law Enforcement <http://www.nmfs.noaa.gov/ole/index.html>

fisheries for pollock, Pacific cod or Atka mackerel are required [Section 679.7(a)(18)] to have an operable VMS on board. This requirement is necessary to monitor fishing restrictions in Steller sea lion protection and forage areas. Also, when the vessels are fishing Pacific cod in the state parallel fishery, they would use their VMS as directed by their federal fishing permit.

11.2/11.4 Fishing permit requirements:

No foreign fleet is allowed to fish in the Alaska's EEZ. Every fishing vessel targeting flatfish in Alaska is required to have a federal permit. The permit programs are managed by the Restricted Access Management (RAM) federal division.

The flatfish fisheries of Alaska under assessment here are harvested exclusively within the Alaska EEZ only. Those fisheries are not part of any international agreement or part of a framework of sub-regional or regional fisheries management organizations or arrangements. Flatfish fisheries in international waters abutting the GOA or BSAI EEZ occur in north-western British Columbia and in Russian waters across the Bering Sea Convention Line. Those fisheries are regulated by their own Governments.

11.3 Boardings and Violations.

Flatfish fisheries in the Gulf of Alaska and Bering Sea are primarily targeted by trawl vessels, although there are some other gears that legally land flatfish. The active fleet size of vessels targeting these species is approximately 87 vessels each year in the BSAI, and 85 in the GOA and the Coast Guard attempts to board 18 in the BSAI and 17 in the GOA of these vessels annually.⁵¹ This fleet has a VMS requirement, which makes them relatively easy to track. The Coast Guard boarded 747 fishing vessels with 26 violations detected, providing a detected violation rate of 4%⁵².

Cases of significance 2015:

- AK1202410; F/V Wonder Worker - Owner and operator were charged under the Endangered Species Act and the Marine Mammal Protection Act for allowing the vessel to approach within 3 nautical miles of the Marmot Island Steller sea lion rookery site. A \$1,250 Amended NOVA was issued. [See, Charged cases, item 2, from March 2015 posting, for initial charging information. See, Settled cases, item 1, below, for resolution of this matter.]
- IUU Fishing: A NOVA was issued for \$100,000 to the corporate owner of the Russian-flagged fishing vessel, Admiral Kolchak. The vessel was about 1,100 yards inside the maritime boundary line when it was detected by the U.S. Coast Guard. While the Coast Guard was unable to interdict and seize the vessel, the on-scene helicopter crew developed a case package clearly showing illegal fishing.⁵³

Fundamental 12

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

⁵¹ NOAA Office of Law Enforcement Annual Report Fiscal year 2015:

http://www.nmfs.noaa.gov/ole/docs/2015/ole_fy2015_annual_report.pdf

⁵² USCG 2015 report <http://www.npfmc.org/committees/enforcement-committee/>

⁵³ NOAA Office of the General Counsel, Enforcement Section Enforcement Actions January 1, 2015, through June 30, 2015

http://www.gc.noaa.gov/documents/2015/Internet_Posting_for_September_2015_09022015.pdf

No. Supporting clauses	4
Supporting clauses applicable	2
Supporting clauses not applicable	2
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

12.1/12.2 Enforcement policies and regulations, state and federal:

In Alaska waters, enforcement policy section 50CFR600.740 states⁵⁴:

The Magnuson-Stevens Act provides four basic enforcement remedies for violations, in ascending order of severity, as follows: (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. It shall be the policy of NMFS to enforce vigorously and equitably the provisions of the MSA by utilizing that form or combination of authorized remedies best suited in a particular case to this end⁵⁵.

Processing a case under one remedial form usually means that other remedies are inappropriate in that case. However, further investigation or later review may indicate the case to be either more or less serious than initially considered, or may otherwise reveal that the penalty first pursued is inadequate to serve the purposes of the MSA. Under such circumstances, the Agency may pursue other remedies either in lieu of or in addition to the action originally taken. Forfeiture of the illegal catch does not fall within this general rule and is considered in most cases as only the initial step in remedying a violation by removing the ill-gotten gains of the offense.

If a fishing vessel for which a permit has been issued under the MSA is used in the commission of an offense prohibited by section 307 of the MSA, NOAA may impose permit sanctions, whether or not civil or criminal action has been undertaken against the vessel or its owner or operator. In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

The "Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions" issued by NOAA Office of the General Counsel – Enforcement and Litigation on March 16, 2011. In that Policy, the NOAA General Counsel's Office committed to periodic review of the Penalty Policy to consider revisions or modifications as appropriate. The July 2014 revised version of the Penalty Policy is a result of that review. The purpose of the 2014 Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources. Under this Policy, NOAA expects to improve consistency at a national level, provide greater predictability for the regulated

⁵⁴ 50CFR600.740 Enforcement policy NOAA. Update of NOAA Fisheries Enforcement Programs and Operations. Accessed 2015. http://www.nmfs.noaa.gov/sfa/reg_svcs/Councils/ccc_2011/Tab%20L%20-%20Enforcement%20Issues/Enforcement%20Issues.pdf

⁵⁵ The Alaska State Legislature. Accessed 2015 <http://www.legis.state.ak.us/basis/aac.asp#TitleTable>

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^{56,57}.

Fundamental 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.

No. Supporting clauses	13
Supporting clauses applicable	13
Supporting clauses not applicable	0
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

13.1. Research and Institutional capacity for environmental impact assessment.

Tens of millions of dollars on research essential to NPFMC management has occurred over the past decade to understand the Bering Sea and Gulf of Alaska ecosystems and how these systems play a dynamic role in flatfish stock status. Major research projects like the Bering Sea Integrated Ecosystem Research Program (BSIERP) and the GOA Integrated Ecosystem Research Program (GOAIERP) have provided and are providing, among many others, significant insight into these major North Pacific Integrated Ecosystem Research Plans and research findings that are presented annually at the North Pacific Science Symposium.

The North Pacific Research Board (NPRB) was created by Congress in 1997 to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean with a priority on cooperative research efforts designed to address pressing fishery management or marine ecosystem information needs. While the NPRB has invested millions of dollars on obtaining this objective, they have also developed two special projects that seek to understand the integrated ecosystems of the BSAI and GOA. For the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the \$17.6 million Gulf of Alaska ecosystem study that looks at the physical and biological mechanisms that determine the survival of juvenile groundfish in the eastern and western Gulf of Alaska⁵⁸.

For the Bering Sea, a large multiyear ecosystem project is moving towards completion. It consists of two

⁵⁶ NOAA Office of the General Counsel – Enforcement Section Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions: http://www.gc.noaa.gov/documents/Penalty%20Policy_FINAL_07012014_combo.pdf

⁵⁷ NOAA Penalty Policy and Schedules. Accessed 2016. <http://www.gc.noaa.gov/enforce-office3.html>

⁵⁸ North Pacific Research Board Gulf of Alaska Project: <http://www.nprb.org/gulf-of-alaska-project>

large projects that will be integrated. One funded by the National Science Foundation (NSF's BEST program is the Bering Ecosystem Study, a multi-year study (2007-2010)). The other funded by NPRB (BSIERP, is the Bering Sea Integrated Ecosystem Research Program (2008-2012)⁵⁹). The overlapping goals of these projects led to a partnership that brings together some \$52 million worth of ecosystem research over six years, including important contributions by NOAA and the US Fish & Wildlife Service. From 2007 to 2012, NPRB, NSF, and project partners are combining talented scientists and resources for three years of field research on the eastern Bering Sea Shelf, followed by two more years for analysis and reporting.

The NMFS and the NPFMC, and other institutions interested in the North Pacific conduct assessments and research on environmental factors on flatfish and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem SAFE documents and other reports. SAFE documents for BSAI^{60 61 62 63 64 65 66 67} and GOA^{68 69 70 71 72 73} flatfish summarize ecosystem considerations for the stocks.

13.2/13.3 Fishery Interaction with the ecosystem.

Ecosystem effects on the Flatfish stocks.

The prey and predators of BSAI and GOA flatfish are well documented. The composition of most flatfish prey varies by species, time and area. NPFMC and NOAA/NMFS conduct assessments and research on environmental factors as affected by the commercial flatfish fisheries and associated species and their habitats. Findings and conclusions are published in the Ecosystem section of the SAFE documents, annual Ecosystem Considerations documents, and the various other research reports. The SAFE reports include sections for 1) Ecosystem effects on the stock and 2) Effects of the fishery on the ecosystem.

The Resource Ecology and Ecosystem Management (REEM) group at the Alaska Fishery Science Center (AFSC) provides up-to-date ecosystem information and assessments in annual Ecosystem Considerations

⁵⁹ North Pacific Research Board Bering Sea Project: <http://www.nprb.org/bering-sea-project>

⁶⁰ Assessment of the yellowfin sole stock in the Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIyfin.pdf>

⁶¹ Assessment of Greenland turbot (*Reinhardtius hippoglossoides*) in the Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIrturbot.pdf>

⁶² Assessment of the arrowtooth flounder stock in the Eastern Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIatf.pdf>

⁶³ Assessment of the Kamchatka flounder stock in the Bering Sea/Aleutian Islands,
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIkamchatka.pdf>

⁶⁴ Assessment of the Northern Rock Sole stock in the Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIrocksole.pdf>

⁶⁵ Assessment of the Flathead Sole-Bering flounder Stock in the Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIflathead.pdf>

⁶⁶ Assessment of the Alaska plaice stock in the Bering Sea/Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIplaice.pdf>

⁶⁷ Assessment of the other flatfish stock complex in the Bering Sea and Aleutian Islands
<http://www.afsc.noaa.gov/REFM/Docs/2015/BSAIoflat.pdf>

⁶⁸ Assessment of the Shallow-water Flatfish Stock Complex in the Gulf of Alaska
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOAshallowflat.pdf>

⁶⁹ Assessment of the northern and southern rock sole (*Lepidopsetta polyxystra* and *bilineata*) stocks in the Gulf of Alaska for 2016
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOAnsrocksole.pdf>

⁷⁰ Assessment of the Deepwater Flatfish Stock Complex in the Gulf of Alaska
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOAdeepflat.pdf>

⁷¹ Assessment of the rex sole stock in the Gulf of Alaska
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOArex.pdf>

⁷² Assessment of the arrowtooth flounder stock in the Gulf of Alaska
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOAatf.pdf>

⁷³ Assessment of the Flathead Sole Stock in the Gulf of Alaska
<http://www.afsc.noaa.gov/REFM/Docs/2015/GOAflathead.pdf>

documents, found under the groundfish stock assessment reports page.^{74 75}

NOAA also supports the Fisheries and the Environment (FATE) program to ensure the sustainable use of US fishery resources under a changing climate. The focus of FATE is on the development, evaluation, and distribution of leading ecological and performance indicators.⁷⁶

⁷⁴ NPFMC Ecosystem Considerations 2015 Status of Alaska's Marine Ecosystems

<http://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf>

⁷⁵ Alaska Marine Ecosystem Considerations <http://access.afsc.noaa.gov/reem/ecoweb/index.php?ID=0>

⁷⁶ FATE Fisheries and the Environment <http://www.st.nmfs.noaa.gov/fate/index>

Table 13.1 Ecosystem effects on the Flatfish Stocks in BSAI

BSAI	Indicators / Interpretation		
Fish Species (Common & Scientific Name)	Prey availability or abundance trends	Predator population trends	Changes in habitat quality
Yellowfin sole, <i>Limanda aspera</i>	Benthic infauna: Stable, data limited - unknown	Fish (Pacific cod, halibut, skates) Stable Possible increases to yellowfin sole mortality	Temperature regime: Likely to affect surveyed stock- No concern Winter-spring environmental conditions Affects pre-recruit survival, Probably a number of factors, Causes natural variability
Flathead sole, <i>Hippoglossoides elassodon</i>	Fish, benthic infauna: stable data limited – unknown	Fish (Pacific cod, pollock, turbot, halibut): Stable, possible increases to flathead sole mortality	Temperature regime: Likely to affect timing of spawning and advection to nursery areas Winter-spring environmental conditions: Affects pre-recruit survival, Probably a number of factors, Causes natural variability
Northern rock sole, <i>Lepidopsetta polyxstra</i> Southern rock sole, <i>Lepidopsetta bilineatus</i>	Benthic infauna: Stomach contents Stable, data limited Unknown	Fish (Pollock, Pacific cod, halibut, yellowfin sole, skates): Stable Possible increases to rock sole mortality	Temperature regime: Cold years rock sole catchability and herding may Decrease, Likely to affect surveyed stock Winter-spring environmental Conditions: Affects pre-recruit survival Probably a number of Factors., Causes natural variability
Arrowtooth flounder, <i>Atheresthes stomias</i>	Benthic infauna; Stable, data limited- Unknown	Fish (Pollock, Pacific cod): Possible increases to arrowtooth mortality- no concern	Temperature regime: Likely to affect surveyed stock – no concern Winter-spring environmental conditions: no. of factors -causes natural variability
Kamchatka flounder, <i>Atheresthes evermanni</i>	Benthic infauna: Stomach contents Stable, data limited Unknown	Fish: Stable Possible increases to Kamchatka mortality	Temperature regime: Cold years Kamchatka catchability and herding may Decrease, Likely to affect surveyed stock Winter-spring environmental Conditions: Affects pre-recruit survival Probably a number of Factors, causes natural variability
Alaska plaice, <i>Pleuronectes quadrituberculatus</i>	Benthic infauna: Stomach contents Stable, data limited Unknown	Fish (P. cod, halibut, yellowfin sole): Stable Possible increases to plaice mortality	Temperature regime: Likely to affect timing of spawning and advection to nursery areas Winter-spring environmental conditions: Affects pre-recruit survival, Probably a number of factors, Causes natural variability
Greenland turbot, <i>Reinhardtius hippoglossoides</i>	No info in SAFE	No info in SAFE	Data gaps and research priorities: Evaluating the extent that Greenland turbot are affected by temperature and environmental conditions relative to survey gear.

Table 13.2 Ecosystem effects on the Flatfish Stocks in GOA

GOA	Indicators / Interpretation		
Fish Species (Common & Scientific Name)	Prey availability or abundance trends	Predator population trends	Changes in habitat quality
Flathead sole, <i>Hippoglossoides elassodon</i>	Pandalid shrimp, brittle stars, polychaetes, mollusks, bivalves and hermit crab: stable data limited – unknown	Fish (arrowtooth flounder, walleye pollock, Pacific cod): Stable, possible increases to flathead sole mortality	No info in SAFE
Northern rock sole, <i>Lepidopsetta polyxstra</i> Southern rock sole, <i>Lepidopsetta bilineatus</i>	Assessed as part of the shallow-water Flatfish Complex in the GOA: Flatfish consume a variety of benthic organisms	No info in SAFE	No info in SAFE
Arrowtooth ⁷⁷ flounder, <i>Atheresthes stomias</i>	Zooplankton, fish, benthic invertebrates; Stomach contents, Stable, data limited	Fish (Pacific halibut, Stellar sea lions, Pacific cod): Possible increases to arrowtooth mortality	No info in SAFE
Rex sole, <i>Glyptocephalus zachirus</i>	Benthic infauna: amphipods, polychaetes and shrimp, data limited	Longnosed skate and arrowtooth flounder: unexplained mortality is the second largest component of mortality	No info in SAFE

⁷⁷ Assessment of the arrowtooth flounder stock in the GOA 2013. Appendix B

<http://www.afsc.noaa.gov/REFM/Docs/2013/GOAatf.pdf>

Flatfish fishery effects on the ecosystem.

Table 13.3 Flatfish fishery effects on the ecosystem BSAI

BSAI	Indicators / Interpretation				
Fish Species	Fishery contribution to bycatch	Fishery concentration in space and time	Fishery effects on amount of large size target fish	Fishery contribution to discards and offal production	Fishery effects on age-at-maturity and fecundity
Yellowfin sole, <i>Limanda aspera</i>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored, Bycatch levels small relative to forage biomass</p> <p>HAPC biota: Low bycatch levels of (spp), Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact, Data limited, likely safe</p> <p>No concern</p>	Low exploitation rate Little detrimental effect No concern	Low exploitation rate Natural fluctuation No concern	Stable trend Improving, but data limited Possible concern	Unknown NA Possible concern
Flathead sole, <i>Hippoglossoides elassodon</i>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored, Bycatch levels small relative to forage biomass</p> <p>HAPC biota: Low bycatch levels of (spp), Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact, Data limited, likely safe</p> <p>No concern</p>	Low exploitation rate Little detrimental effect No concern	Low exploitation rate Natural fluctuation No concern	Stable trend Improving, but data limited Possible concern	Unknown NA Possible concern
<p>Northern rock sole, <i>Lepidopsetta polyxstra</i></p> <p>Southern rock sole, <i>Lepidopsetta bilineatus</i></p>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored Bycatch levels small relative to forage biomass</p> <p>HAPC biota Low bycatch levels of (spp): Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact Data limited, No Concern</p>	Low exploitation rate Little detrimental effect No concern	Low exploitation rate Natural fluctuation No concern	Stable trend Improving, but data limited Possible concern	unknown NA Possible concern
Arrowtooth flounder,	<p>Prohibited species: Stable, heavily monitored, Minor</p>	Very low exploitation	Very low exploitation	Stable trend Improving,	Unknown NA

<i>Atheresthes stomias</i>	<p>contribution to mortality</p> <p>Forage: Stable, heavily monitored, Bycatch levels small relative to forage biomass</p> <p>HAPC biota: Low bycatch levels of (spp), Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact, Data limited, likely to be safe. No concern</p>	<p>rate Little detrimental effect No concern</p>	<p>rate Natural fluctuation No concern</p>	<p>but data limited Possible concern</p>	<p>Possible concern</p>
Kamchatka flounder, <i>Atheresthes evermanni</i>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored Bycatch levels small relative to forage biomass</p> <p>HAPC biota: Low bycatch levels of (spp), Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take Safe</p> <p>Sensitive non-target species: Likely minor impact Data limited, likely to be safe. No concern</p>	<p>Recent high exploitation rate Little detrimental effect No concern</p>	<p>Recent high exploitation rate, but unknown effect Natural fluctuation No concern</p>	<p>Stable trend Improving, but data limited Possible concern</p>	<p>unknown NA Possible concern</p>
Alaska plaice, <i>Pleuronectes quadrituberculatus</i>	<p>Not a targeted species, harvested in a variety of fisheries in the BSAI</p>	<p>Very low exploitation rate</p>	<p>Very low exploitation rate</p>	<p>Unknown</p>	<p>Unknown NA Possible concern</p>
Greenland turbot, <i>Reinhardtius hippoglossoides</i>	<p>No information in SAFE</p>	<p>Low exploitation rate. 37 year decline in stock up to 2007-2009 increase in abundance</p>	<p>Low exploitation rate. 37 year decline in stock up to 2007-2009 increase in abundance</p>	<p>Unknown</p>	<p>Unknown</p>

Table 13.4 Flatfish fishery effects on the ecosystem GOA

GOA	Indicators / Interpretation				
Fish Species	Fishery contribution to bycatch	Fishery concentration in space and time	Fishery effects on amount of large size target fish	Fishery contribution to discards and offal production	Fishery effects on age-at-maturity and fecundity
Flathead sole, <i>Hippoglossoides elassodon</i>	<p>Prohibited species: 0-2% of the prohibited species catch of each of these species in 2014 and 2015</p> <p>Non-target: In 2014 and 2015, proportion caught in fishery ranged from 0 to 32%.</p> <p>Marine mammals and birds: No seabird or mammal bycatch recorded</p> <p>Sensitive non-target species: Likely minor impact, Data limited</p>	No info in safe	No info in safe	No info in safe	priority for future assessments is to analyze ageing error data for GOA
Northern rock sole, <i>Lepidopsetta polyxstra</i> Southern rock sole, <i>Lepidopsetta bilineatus</i>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored</p> <p>Bycatch levels small relative to forage biomass</p> <p>HAPC biota Low bycatch levels of (spp): Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact Data limited, No Concern</p>	Low exploitation rate Little detrimental effect No concern	Low exploitation rate Natural fluctuation No concern	Stable trend Improving, but data limited Possible concern	unknown NA Possible concern
Arrowtooth flounder, <i>Atheresthes stomias</i>	<p>Prohibited species: Stable, heavily monitored, Minor contribution to mortality</p> <p>Forage: Stable, heavily monitored, Bycatch levels small relative to forage biomass</p> <p>HAPC biota: Low bycatch levels of (spp), Bycatch levels small relative to HAPC biota</p> <p>Marine mammals and birds: Very minor direct-take, Safe</p> <p>Sensitive non-target species: Likely minor impact, Data limited, likely to be safe. No concern</p>	Very low exploitation rate Little detrimental effect No concern	Very low exploitation rate Natural fluctuation No concern	Stable trend Improving, but data limited Possible concern	Unknown NA Possible concern
Rex sole, <i>Glyptocephalus zachirus</i>	<p>Prohibited species: 1% of the halibut PSC caught in 2015</p> <p>Non-target: 0-8% of any species in 2014 and 2015</p> <p>Birds: no birds recorded</p>	Low exploitation rate, mainly bycatch fishery	Mainly bycatch fishery that takes mainly older, larger fish	Unknown	Unknown

13.4. Pollution – MARPOL

MARPOL 73/78 (the "International Convention for the Prevention of Pollution from Ships") is one of the most important treaties regulating pollution from ships. Six Annexes of the Convention cover the various sources of pollution from ships and provide an overarching framework for international objectives. In the U.S., the Convention is implemented through the Act to Prevent Pollution from Ships (APPS). Under the provisions of the Convention, the United States can take direct enforcement action under U.S. laws against foreign-flagged ships when pollution discharge incidents occur within U.S. jurisdiction. When incidents occur outside U.S. jurisdiction or jurisdiction cannot be determined, the United States refers cases to flag states, in accordance with MARPOL. These procedures require substantial coordination between the Coast Guard, the State Department, and other flag states, and the response rate from flag states has been poor. Different regulations apply to vessels, depending on the individual state^{78,79}.

13.5. Management responses to likely serious impacts on ecosystem

Regulations/measures to minimize impacts.

Habitat interaction is not considered significant in the flatfish fisheries partly because of the development of trawl sweep modification, already implemented in the BSAI Region and implemented in the GOA in 2014. Bycatch is recorded in detail and endangered species interactions with Steller sea lions and short-tailed albatross are tightly monitored and regulated. The current ESA biological opinion specifies that the expected take of Short tailed albatross (bycatch) in the longline fishery is four in any 2-year period. In the event that a fifth bird is bycaught, an ESA Section 7 consultation involving the U.S. Fish and Wildlife Service and the National Marine Fisheries Service must be initiated. This process can lead to additional regulatory action on the fishery. There seems to be a generally decreasing trend in seabird bycatch since the new estimation procedures began in 2007, indicating no immediate management concern other than continuing the goal of decreased seabird bycatch. It is difficult to determine how seabird bycatch numbers and trends are linked to changes in ecosystem components because seabird mitigation gear is used in the longline fleet.⁸⁰ Also, NMFS uses Steller sea lion protection measures (SSLPM) to ensure the groundfish fisheries off Alaska are not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify their critical habitat. The management measures disperse fishing over time and area to protect against potential competition for important Steller sea lion prey species near rookeries and important haul-outs.

The BSAI and GOA flatfish stocks are not considered overfished. Furthermore serious impacts are regulated in the FMPs by identifying ecosystem components and non-target stocks that are vulnerable or important for food web functioning (prohibited and forage species).

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) mandates NOAA to identify habitats essential for managed species and conserve habitats from adverse effects on those habitats (NMFS 2010). These habitats are termed "Essential Fish Habitat" or EFH, and are defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NMFS 2010).⁸¹ The National Marine Fisheries Service (NMFS) and regional Fishery Management Councils (Councils) must describe and identify EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies that authorize, fund, or undertake actions that may adversely affect EFH must consult with NMFS, and NMFS must provide conservation

⁷⁸ Act to Prevent Pollution from Ships, 33 U.S.C. §§ 1901–1915. <https://www.law.cornell.edu/uscode/text/33/1901>

⁷⁹ U.S. Government Accountability Office, Washington, D.C. (2000). "Progress Made to Reduce Marine Pollution by Cruise Ships, but Important Issues Remain." Report to Congressional Requesters. Report No. RCED-00-48. <http://www.gao.gov/assets/230/228813.pdf>

⁸⁰ NPFMC Ecosystem Considerations 2015 <http://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf>

⁸¹ NMFS Essential Fish Habitat Research Plan:

http://www.afsc.noaa.gov/HEPR/docs/Sigler_et_al_2012_Alaska_Essential_Fish_Habitat_Research_Plan.pdf

recommendations to federal and state agencies regarding actions that would adversely affect EFH.⁸²

13.6. Research on environment and social impacts of fishing gear

Humans as part of the ecosystem is one of the indicators used in the ecosystem based approach to fisheries management in Alaska. Monitoring the numbers of fishing vessels provides general measures of fishing effort, the level of capitalization in the fisheries, and the potential magnitude of effects on industry stakeholders caused by management decisions.⁸³ The total number of vessels participating in federally-managed fisheries off Alaska has generally decreased since 1994, though participation has remained relatively stable in recent years. Vessels using hook and line or jig gear have accounted for most of the participating vessels from 1994 to 2014. 581 such vessels participated in 2014, down from a high of 1,225 two decades prior. The number of active trawl-gear vessels has decreased steadily from over 250 annually in the period from 1994 to 1999 to around 180 in each of the last 5 years.

⁸² NPFMC Essential Fish Habitat – EFH <http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/>

⁸³ NPFMC Ecosystem considerations 2015: <http://www.afsc.noaa.gov/REFM/Docs/2015/ecosystem.pdf>

F. Serious Impacts of the Fishery on the Ecosystem

Fundamental 14

Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.

No. Supporting clauses	4
Supporting clauses applicable	0
Supporting clauses not applicable	4
Overall level of conformity	HIGH
Non Conformances	0

Summarized evidence:

14.1 States shall promote responsible development and management of aquaculture, including an advanced evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information.

14.2 aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities.

14.3 Effective procedures specific to aquaculture of fisheries enhancement shall be established to undertake appropriate environmental assessment and monitoring, with the aim of minimizing adverse ecological changes (such as those caused by inputs from enhancement activities and related economic and social consequences).

Not applicable as this is not an enhanced fishery.

7. Performance specific to agreed corrective action plans

Not Applicable. This is the 2nd FAO RFM Alaska Flatfish surveillance assessment report. No non-conformances were issued during the full assessment or this surveillance assessment.

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

Not applicable, no new non conformances have been issued.

9. Future Surveillance Actions

No specific items highlighted – general review of all surveillance criteria

10. Client signed acceptance of the action plan

Not applicable.

11. Recommendation and Determination

Following this 2nd surveillance assessment, the assessment team recommends that continued Certification under the Alaska Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the Alaska flatfish complex distributed in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) and specifically includes: BSAI Alaska plaice (*Pleuronectes quadrituberculatus*), BSAI/GOA arrowtooth flounder (*Atheresthes stomias*), BSAI/GOA flathead sole (*Hippoglossoides elassodon*), BSAI Greenland turbot (*Reinhardtius hippoglossoides*), BSAI Kamchatka flounder (*Atheresthes evermanni*), BSAI/GOA northern rock sole (*Lepidopsetta polyxystra*), GOA rex sole (*Glyptocephalus zachirus*), GOA southern rock sole (*Lepidopsetta bilineata*) and BSAI yellowfin sole (*Limanda aspera*). The Alaska flatfish complex commercial fisheries employ Alaska flatfish trawl gear and longline gear (Greenland Turbot only) within Alaska's jurisdiction (200 nautical miles EEZ). These fisheries are principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).

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Appendix 1

Assessment Team Details

Dr. Ivan Mateo, Lead Assessor

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

William Brodie (Assessor)

Bill Brodie is an independent fisheries consultant with previously, a 36-year career with Science Branch of Fisheries and Oceans Canada (DFO, Newfoundland and Labrador Region). He has a BSc in Biology from Memorial University of Newfoundland and Labrador. For the last twelve years of service he worked as Senior Science Coordinator/Advisor on Northwest Atlantic Fisheries Organization (NAFO) issues, serving as chair of the Scientific Council of NAFO and chairing 3 of its standing committees. As a senior stock assessment biologist, he led assessments and surveys for several flatfish species and stocks, including American plaice, Greenland halibut, yellowtail and witch flounders. These include the largest stocks of flatfish in the NW Atlantic. He also participated in ICES assessments of flatfish, gadoid, and shrimp stocks in the NE Atlantic and North Sea. Bill has participated in over 30 scientific research vessel surveys on a variety of Canadian and international ships, and he has over 200 publications in the scientific and technical literature, primarily on flatfish stock assessment. He has worked with fishery managers and the fishing industry on a variety of issues, including identification of ecologically sensitive areas, and developing rebuilding plans for groundfish under a Precautionary Approach. Recently, Bill has served as an assessor on FAO-based Responsible Fisheries Management certification surveillance audits for Alaskan stocks including Pacific cod, halibut, and sablefish.

Deirdre Hoare (Assessor)

Deirdre Hoare has a BSc in Marine Science and an MSc in Marine Zoology from the National University of Ireland, Galway and a post graduate diploma in Statistics from Trinity College Dublin. Deirdre has worked directly in fisheries stock assessment as an observer on international projects in NAFO and Ireland. For 5 years she worked as a Fisheries Assessment Analyst and as a Scientific and Technical Officer for the Marine Institute in Ireland. This work involved fisheries research and stock assessment for ICES working groups. The work also involved coordination and management of a Fisher Self sampling program in the Irish Sea, with particular emphasis on spatial and temporal discard measurement tools. Currently Deirdre is working as an independent Fisheries Consultant. Her work currently involves evaluation and verification of fisheries management and sustainability against international standards. She also performs fish stock assessments, evaluate data and outlines the limitations.

Sam Dignan (Assessor)

Sam Dignan is a fisheries scientist who has previously worked with the Department of Environment, Food and Agriculture (DEFA), Isle of Man and Bangor University Fisheries and Conservation Science Group (Wales). He has a BSc in Biological and Chemical Sciences with Zoology from University College Cork, Ireland and an MSc in Marine Environmental Protection from Bangor University. He has experience conducting stock assessments including from survey design, implementation, data collection, stock assessment modelling and through to final analysis and report presentation. From 2013 to 2015 he was a member of the ICES working group on scallop stock assessment and has an understanding of a range of shellfish and finfish fishery stock assessment applications. He has worked on behalf of UK fisheries departments for the analysis of fishing activity, using Vessel Monitoring System (VMS) and logbook data, to spatially quantify fishing activity and fisheries-ecosystem interactions. Sam has also been involved in providing scientific data for client fisheries to the Marine Stewardship Council's (MSC) certification scheme and has been a central part in participating on behalf of the client fishery management responses to MSC audits. A native and active member of a small fishing community in the Southwest of Ireland, Sam has extensive experience of interacting directly with fishers and their representative organizations as well as members of scientific and government institutions.