DNV·GL

THE PUBLIC COMMENT FULL RE-ASSESSMENT REPORT

ALASKA RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION SCHEME, VERSION 1.3

Alaska Flatfish Complex fishery

Alaska Seafood Cooperative

Authors: Anna Kiseleva, Giuseppe Scarcella, Jodi Bostrom, Paul Knapman
Report No.: R2019-004 REV 0
Certificate No.: 209971-2016-AQ-NOR-ASI
Date: 29.10.2019

Report type:	The public comment full re-assessment report	DNV GL - Business Assurance
Report title:	Report for the Alaska Flatfish Complex fishery	DNV GL Business Assurance Norway AS Veritasveien 1 1322 HØVIK, Norway Tel: +47 67 57 99 00 http://www.dnvgl.com
Customer:	Alaska Seafood Cooperative 4241 21st Avenue W, Suite 302 Seattle, WA 98199	
Contact person:	Mark Fina	
Date of issue:	29.10.2019	
Project No.:	PRJC-549594-2016-MSC-NOR	
Organisation unit:	ZNENO418	
Report No.:	R2019-004, Rev. 0	
Certificate No:	209971-2016-AQ-NOR-ASI	

Objective:
The objective of this report is re-assessment audit of the Alaska Flatfish Complex fishery against the RFM Version 1.3 standard.

Prepared by:
Anna Kiseleva, DNV GL Senior Assessor
Giuseppe Scarcella, Stock Assessment expert
Jodi Bostrom, Ecosystem impacts expert
Paul Knapman, Management system expert

☒ Unrestricted distribution (internal and external)
☐ Unrestricted distribution within DNV GL
☐ Limited distribution within DNV GL after 3 years
☐ No distribution (confidential)
☐ Secret

Keywords:
RFM, Alaska, flatfish

Rev. No.	Date	Reason for Issue	Prepared by
0	03.10.2019	Client Report	Anna Kiseleva, Giuseppe Scarcella, Jodi Bostrom, Paul Knapman.
0	10.10.2019	Peer Review Report	Anna Kiseleva, Giuseppe Scarcella, Jodi Bostrom, Paul Knapman.
0	29.10.2019	The Public Comment Full Re-assessment Report	Anna Kiseleva, Giuseppe Scarcella, Jodi Bostrom, Paul Knapman.
0	[yyyy-mm-dd]	Final Assessment Report and certification decision	

Table of contents

GLOSSARY

Abbreviations & acronyms

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AI	Aleutian Islands
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
EBS	Eastern Bering Sea
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 or t	Metric tons
MSY	Maximum Sustainable Yield
MSST	Minimum Stock Size Threshold
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

1 SUMMARY AND THE UNIT OF THE CERTIFICATION

The purpose of this report is a full re-assessment of the Alaska flatfish complex fishery against the RFM standard v1.3.

This report contains the findings of the RFM Fisheries re-assessment audit conducted for the client Alaska Seafood Cooperative and Alaska flatfish complex fishery during 17-21 June 2019 in Seattle, US.

The Alaska Responsible Fishery Management program is a voluntary program that has been developed by ASMI to provide an independent, third- party certification that can be used to verify that these fisheries are responsibly managed according to the Alaska RFM standard. Additionally, application to the Alaska RFM is only available for fisheries operating within the Alaska 200 nm EEZ.

The Alaska RFM Certification program uses the fundamental clauses of the Alaska RFM Conformance Criteria Version 1.3 and is 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). The fundamental clauses are:

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

Table 1 General information and the Unit of the Certification

Fishery name	Alaska Flatfish Complex Fishery		
Unit(s) of Assessment (UoA)	Applicant Group:	Alaska Seafood Cooperative	
	Product Common Name (Species):	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 polyxstra)* *BSAI Yellowfin sole (Limanda aspera)* BSAI Southern rock sole *(Lepidopsetta bilineatus)* GOA Rex sole *(Glyptocephalus zachirus)*	
	Geographic Location:	Gulf of Alaska and Bering sea & Aleutian Islands within Alaska jurisdiction (200 nautical miles EEZ).	
	Gear Types:	Bottom trawl and Longline	
	Principal Management Authority:	National Marine Fisheries Service; North Pacific Fishery Management Council; National Oceanic and Atmospheric Administration	
Date certified	5 December 2013	Date of certificate expiry	4 December 2019
Audit type	Re-assessment		
Audit date	17-21 June 2019		
Assessment team	Lead assessor: Anna Kiseleva Assessor(s): Giuseppe Scarcella, Jodi Bostrom, Paul Knapman		

1.2 Assessment timeline

Table 2 Assessment timeline

Event	Date
Announcement of re-assessment:	2019-05-16
Site visit and stakeholder consultations:	From 2019-06-17 until 2019-06-21
Expected date of recertification:	2019-12-05

1.3 A summary of the conformance of the fishery to the RFM Fishery Standard v1.3

Fundamental Clause	Evidence adequacy rating:	Justification:
1: Structured and legally mandated management system	High	The Alaskan Flatfish 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); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, Alaskan fisheries are managed under the Council'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). Within state waters, ADFG and the BOF manage the flatfish fisheries as "parallel" or state fisheries, conducted under federal TACs, regulations and management measures. The US Coast Guard (USCG), the NMFS Office of Law Enforcement (OLE) and the Alaska Wildlife Troopers (AWT) and/or deputized ADFG staff, enforce fisheries regulations in federal and state waters respectively.
2: Coastal area management frameworks	High	The NMFS and 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 Council and the BOF tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourage stakeholder participation, and their deliberations are conducted in open, public sessions. The Community Development Quota (CDQ) Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries. There are 65 communities within a fifty-mile radius of

		the Bering Sea coastline who participate in the program, which allocates 10.7% of the BSAI TAC for the flatfish complex (as well as allocations for other species).
3: Management objectives and plan	High	The Magnuson Stevens Fishery Conservation and Management Act (MSA) is the primary domestic legislation governing the management of the USA marine fisheries. Under the MSA, NPFMC is authorized to prepare and submit to the Secretary of Commerce a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the GOA and BSAI which incorporate the flatfish fisheries in those regions. Both FMPs contain long-term management objectives, reviewed annually by the Council.
4: Fishery data	High	The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the flatfish fisheries and ecosystems in GOA and BSAI. Stock Assessment and Fishery Evaluation (SAFE) reports provide complete descriptions of data collections and time series. Records of catch and effort are firstly recorded through the e-landing (electronic fish tickets) catch recording system and secondly, collected by vessel captains in logbooks. Fishery independent data are collected in regular trawl and longline surveys of both the GOA and BSAI regions and additional fishery dependent data are collected by the extensive observer program present in both regions. Other sources of data are also considered during the stock assessment process.
5: Stock assessment	High	The NMFS has a well-established institutional framework for research developed within the AFSC. Scientists at the AFSC conduct research and stock assessments on flatfish in Alaska each year, producing annual Stock Assessment and Fishery Evaluation (SAFE) reports for the federally managed BSAI and GOA flatfish stocks. ADFG also conducts scientific research and surveys on fisheries in state waters. These SAFE reports summarize the best-available science, document stock status, significant trends or changes in the resource, marine ecosystems, and fishery over time, assess the relative success of existing state and Federal fishery management programs, and produce recommendations for annual quotas and other fishery management measures. The stock assessments are peer reviewed by experts and recommendations are made annually to improve the assessments. An additional level of peer review by external experts is conducted periodically (CIE reviews). Based on the information in the 2018 SAFE reports, none of the flatfish stocks reviewed in this certification process are determined to have overfishing occurring, none are overfished, and none are approaching an overfished condition.
6: Biological reference points and	High	The stock assessment (SAFE) volume contains a chapter or sub-chapter for each stock, and contains

harvest control rule		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". The NPFMC harvest control system is a complex and multi-faceted suite of management measures to address issues related to sustainability, legislative mandates, and quality of information. The tier system harvest control rules specifiy the maximum permissible Allowable Biological Catch (ABC) and the Overfishing Level (OFL) for each stock. Stocks in tier 3 are further categorized based on the relationship between Biomass and B40%, with tier 3a designating stocks above B40%. The category assigned to a stock also determines the method used to calculate ABC and OFL. As specified in the MSA, if stocks decline below the MSST (e.g. B17.5%), a rebuilding plan must be established to bring the biomass back to the BMSY level within a specified timeframe. For the 13 flatfish stock assessments reviewed in this report, eleven stocks are categorized in Tier 3A, and 2 in Tier 1a.
7: Precautionary approach	High	Precautionary approach (PA)-based reference points are used in the management of the flatfish stocks, and the scientific information and stock assessments available are at a consistently high level, providing the necessary basis for conservation and management decisions. There are three core components to the application of the PA in management of Alaskan groundfish fisheries. Firstly, the FMP for each management area sets out an Optimum Yield (OY) for the groundfish complex in each of BSAI and GOA Regions as a whole, which includes flatfish along with the majority of targeted groundfish species. This value has been accepted as 2 million t for the BSAI Region. The second component is the tier system, which assigns each groundfish stock to a tier according to the level of scientific understanding, data available, and uncertainty associated with the fishery. Each tier has an associated set of management guidelines, particularly in relation to calculating the level of catch permitted. The third component is Overfishing Limit (OFL), Acceptable Biological Catch (ABC) and Total Allowable Catch (TAC) system.
8: Management measures to produce maximum sustainable levels	High	The Magnuson Stevens Act is the federal legislation that defines how fisheries off the United States EEZ are to be managed. Stocks are measured against metrics defined in the MSA and if they are overfished, approaching an overfished condition, or overfishing is occurring, specific measures must be taken, such as implementing a rebuilding program within specified timeframes. The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. From the MSA legislation and NPFMC objectives, the management system for the Alaska groundfish fisheries has developed into a complex suite of measures comprised of harvest controls. These include catch limits (OY, TAC, ABC,

		OFL), effort controls (limited access, licenses, cooperatives), time and/or area closures (habitat protected areas, marine reserves), bycatch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), observers, monitoring and enforcement programs, social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL)). Specific measures taken in flatfish fisheries in Alaska include gear modifications to reduce bottom contact in trawl fisheries, deck sorting to improve halibut survival, and use of excluder devices to reduce bycatch of certain species. By-catches, discards, and prohibited species catches are all closely managed, and actions taken where required.
9: Appropriate standards of fisher's competence	High	Through education and training programs, the state of Alaska enhances the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishers are maintained by various agencies, along with their qualifications.
10: Effective legal and administrative framework	High	The Alaska flatfish fisheries use 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, and conduct patrols on land, in the air and at sea. Observers are required to report infringements, and OLE and USCG officers conduct de-briefing interviews with observers, checking on vessels fishing practices and the conduct of the crew. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation. State regulations are enforced by the Alaska Wildlife Troopers (AWT).
11: Framework for sanctions	High	The MSA 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 MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 NOAA 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 AWT enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's

		right to fish if convicted of a violation. The low proportion of violations encountered during at-sea patrols of the Alaska fisheries demonstrates effective deterrence. ADFG considers that sanctions are effective deterrents in the state fisheries.
12: Impacts of the fishery on the ecosystem	High	The NPFMC, NOAA (NMFS) and other relevant organisations continue to closely monitor the fisheries and their respective environmental effects. Appropriate significance appears to be allocated to issues of concern (including in response to stakeholder concerns – such as effects on bycatch populations and effects on habitat). Fishery management plans, Environmental Impact Assessments and other assessments are kept under review. No changes are apparent in the management of the GoA or BSAI fisheries that would detrimentally affect performance against the confidence ratings for any supporting clauses. Full conformance continues against all supporting clauses.
13: Enhanced fisheries	NA	NA: Not an enhanced fishery

1.4 Non-conformances raised and corrective action plans

No non-conformances were raised during the re-assessment of the Alaska flatfish complex fishery and no corrective action plans are therefore required.

1.5 The recommendation for re-certification of the Assessment Team

The Unit of Certification	Status of certification	Comment
Alaska flatfish complex commercial fishery (incl.: 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)* employing trawl gear and longline gear (Greenland Turbot only) within Alaska jurisdiction (200 nautical miles EEZ), and principally managed by two federal agencies, the National Marine Fisheries Service (NMFS) and the North Pacific Fishery Management Council (NPFMC).	**Certified, undergoing re-assessment**	Following the results of the re-assessment audit conducted in Seattle, US during 17-21 June 2019, the assessment team recommends the re-certification of this fishery according to the RFM Fisheries standard v1.3.

2 ASSESSMENT TEAM AND PEER REVIEWERS DETAILS

Anna Kiseleva DNV GL Lead Assessor:	Anna is a senior assessor and a Global service responsible for MSC Fisheries and RFM certification schemes at DNV GL Business Assurance. She holds MSc degree in International fisheries management from the University of Tromsø and MSc degree in Business Management from Murmansk State Technical University. She has over 15 years of experience in the global seafood industry incl. assessment services, consultancy and project management. She is an experienced project manager with proven ability to lead cross-disciplinary teams. She has been involved in the delivery of the Fisheries assessment services since 2008.
Jodi Bostrom Main area of responsibility Fundamental clause F (Serious Impacts of the Fishery on the Ecosystem):	Ms. Jodi Bostrom joined MRAG Americas as a Senior Fisheries Consultant and MSC Fisheries Program Manager in mid-2015. Prior to joining MRAG Americas, she spent five years working at the Marine Stewardship Council (MSC) in London as a Senior Fisheries Assessment Manager. Among many other things, she developed the MSC's benthic habitats policy and the Consequence Spatial Analysis (a risk-based framework for assessing habitat impacts in data-deficient situations) as part of the MSC Standard revision. Prior to the MSC, Jodi spent 11 years with the National Academy of Sciences' Ocean Studies Board in Washington, DC. She received an M.Sc. in Environmental Science at American University in 2006 and a B.Sc. in Zoology at the University of Wisconsin in 1999. Jodi's main areas of work at MRAG Americas are serving on MSC fisheries assessment teams and reviewing MSC assessment reports for technical quality and compliance. She has particular experience in the Ecosystem impact component.
Giuseppe Scarcella Main area of responsibility Fundamental clause B (Science and Stock Assessment activities) and C (The precautionary approach) and D (Management measures):	Giuseppe Scarcella is an experienced fishery scientist and population analyst and modeller, with wide knowledge and experience in the assessment of demersal stocks. He holds a first degree in Marine Biology and Oceanography (110/110) from the Unversità Politecnica delle Marche, and a Ph.D. in marine Ecology and Biology from the same university, based on a thesis "Age and growth of two rockfish in the Adriatic Sea". After his degree he was offered a job as project scientist in several research programs about the structure and composition of fish assemblage in artificial reefs, off-shore platform and other artificial habitats in the Italian Research Council – Institute of Marine Science of Ancona (CNR-ISMAR). During the years of employment at CNR-ISMAR he has gained experience in benthic ecology, statistical analyses of fish assemblages evolution in artificial habitats, fisheries ecology and impacts of fishing activities, stock assessment, otholith analysis, population dynamic and fisheries management. During the same years he attended courses of uni-multivariate statistics and stock assessment. He is also actively participating in the scientific advice process of FAO GFCM in the Mediterranean Sea. At the moment he is member of the Scientific, Technical and Economic Committee for Fisheries for the European Commission (STECF). He is author and co-author of more than 30 scientific paper peer reviewed journals and more than 150 national and international technical reports, most of them focused on the evolution of fish assemblages in artificial habitats and stock assessment of demersal species.
Paul Knapman Main area of responsibility Fundamental clause A (The Fisheries Management System) and E (Implementation monitoring and control):	Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries more than 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then joined the UK government's nature conservation advisors, establishing and managing their marine fisheries program. He developed an extensive program of work with fisheries managers, scientists, the fishing industry and ENGOs to integrate national and

European fisheries and nature conservation requirements. He also helped lead a national four year project contributing to the 2002 review of the Common Fisheries Policy. He then became Head of the largest inshore fisheries management organisation in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organisations responsibilities and roles included: stock assessments; habitat monitoring; setting and ensuring compliance with total allowable catches and quotas; establishing and applying regional fisheries regulations; the development and implementation of fisheries management plans; the lead authority for the largest marine protected area in England. In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He drafted the first management plan for one of Canada's marine protected areas, undertook an extensive review on IUU fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council. In 2008, Paul joined Moody Marine as their Americas Regional Manager, responsible for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries. Paul returned to consultancy in 2015.

William (Bill) Brodie
Peer Reviewer

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 with DFO he worked as Senior Science Coordinator/Advisor on Northwest Atlantic Fisheries Organization (NAFO) issues, serving as chair of the Scientific Council of NAFO and chairing 3 of its standing committees. As a stock assessment biologist, he led assessments and surveys for several flatfish species and stocks, including American plaice, Greenland halibut, yellowtail and witch flounders. These include the largest stocks of flatfish in the NW Atlantic. He also participated in assessments of flatfish, gadoid, and shrimp stocks in the NE Atlantic and North Sea. Bill has participated in over 30 scientific research vessel surveys on various Canadian and international ships, and he has over 200 publications in the scientific and technical literature, primarily on flatfish stock assessment. He has been involved 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. Since retirement from DFO in 2014, Bill has been contracted to serve as an assessor on several FAO-based Responsible Fisheries Management certification assessment and surveillance audits for Alaskan stocks including Pacific cod, halibut, sablefish, pollock, and flatfish. He has also provided peer review for MSC certification assessments for stocks in Icelandic waters and in the Grand Banks area.

Andrew Hough
Peer Reviewer

Following three years PhD research on crustacean ecology, Andy has worked in the field of marine research and management for over twenty years, including marine conservation biology, fishery impacts on marine ecosystems, marine and coastal environmental impact assessment and policy development.
Andrew has been active in the development of Marine Stewardship Council certification since 1997, when involved in the pre-assessment of the Thames herring fishery. He was a founding Director of Moody Marine and led the establishment of Moody Marine fishery certification systems. He has also worked with MSC on several specific development projects, including those concerned with the certification of small scale/data deficient fisheries. He has been Lead Assessor on many fishery

assessments to date. This has included Groundfish (e.g. cod, haddock, pollock, hoki, hake, flatfish), Pelagics (e.g. tuna species, herring, mackerel, sprat, krill, sardine) and shellfish (molluscs and crustacea); included evaluation of the environmental effects of all main gear types and considered many fishery administrations including the North Atlantic, South Atlantic, Pacific, Southern Ocean and in Europe, North America, Australia and New Zealand, Japan, China, Vietnam and Pacific Islands. He has recently acted solely as an expert team member of Principle 2 inputs of European inshore fisheries and Falkland Islands Toothfish. Andrew has also been involved in the development of certification schemes for individual vessels (Responsible Fishing Scheme) and evaluation of the Marine Aquarium Council standards for trade in ornamental aquarium marine species. Consultancy services have included policy advice to the Association of Sustainable Fisheries, particularly with regard to the implications of MSC standard development, and assistance to fisheries preparing for, or engaged in, MSC assessment.

3 THE BACKGROUND OF THE FISHERY TO BE RE-CERTIFIED

3.1 A General historical background information on the area of the fishery

The following section uses information from the North Pacific Fishery Management Council (NPFMC) groundfish Fisheries Management Plans for the BSAI and GOA and the Alaska Department of Fish and Game (ADFG) website.

Federal Alaska flatfish fisheries are managed as multiple stocks in multiple locations. Geographically, management is split between the BSAI and the GOA, see Figure 1. Some species are managed individually, some as two species units and others as multispecies units.

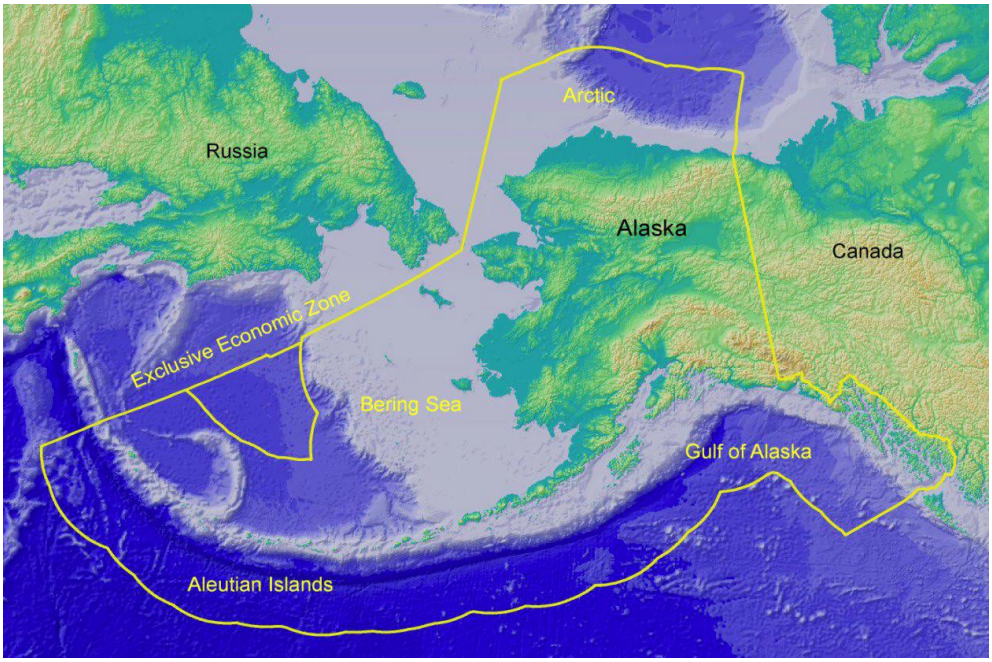


Figure 1. Management area for the Bering Sea, Gulf of Alaska and Aleutian Islands. (NPFMC 2016, https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIGFAmActionSumm.pdf)

The BSAI management area encompasses the U.S. Exclusive Economic Zone (EEZ) of the eastern Bering Sea and that portion of the North Pacific Ocean adjacent to the Aleutian Islands west of 170° W. longitude. The northern boundary of the Bering Sea is the Bering Strait, defined as a straight line from Cape Prince of Whales to Cape Dezhneva, Russia, see Figure 2.

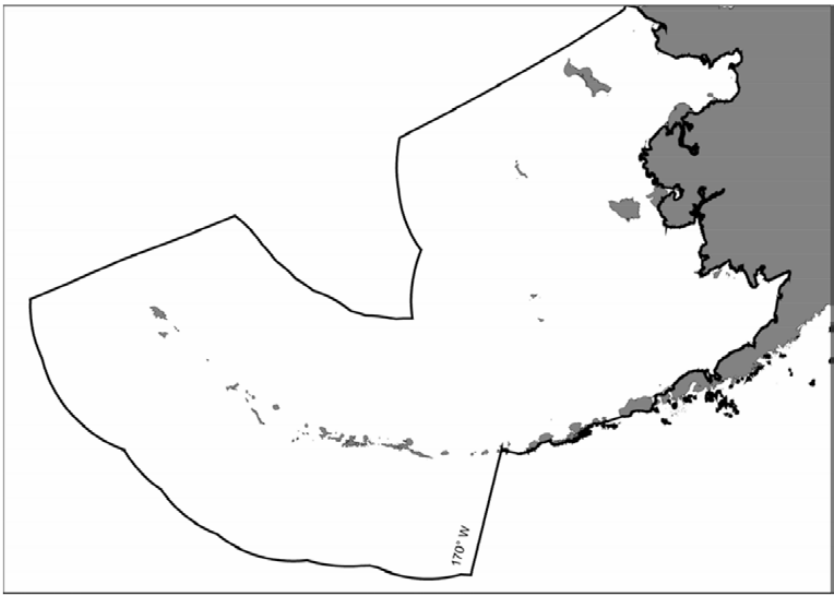


Figure 2. The management area for the Bering Sea and Aleutian Islands (Source: BSAI FMP, 2019, https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf)

The BSAI management area is divided into two fishing areas, the Bering Sea subarea and the Aleutian Islands subarea. For the purpose of spatially allocating total allowable catch, the Aleutian Islands subarea is divided into three districts, the eastern district (between 170° W. and 177° W. longitude), the central district (between 177° W. longitude and 177° E. longitude), and the western district (west of 177° E. longitude), see Figure 3. Flatfish in the BSAI are predominately found on the eastern Bering Sea continental shelf and slope, with lower abundance in the Aleutian Islands for those species whose range extends to that area. Each of the flatfish species is assessed as a single unit in the BSAI (BSAI FMP, 2019).

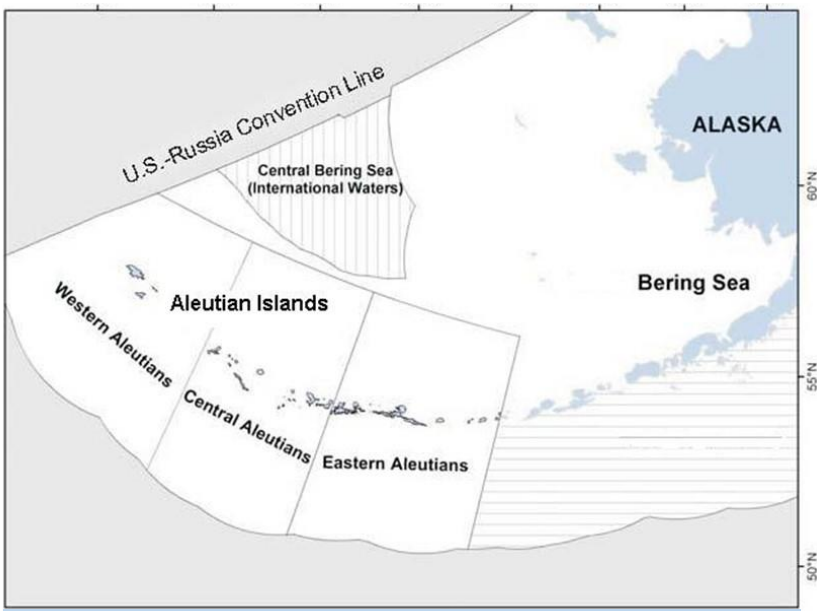


Figure 3. Sub Areas and districts of the Bering Sea and Aleutian Islands management area (NPFMC 2016)

The GOA management area encompasses the U.S. EEZ between the eastern Aleutian Islands at 170°E W. longitude and Dixon Entrance at 132°E 40' W longitude, see Figure 4.

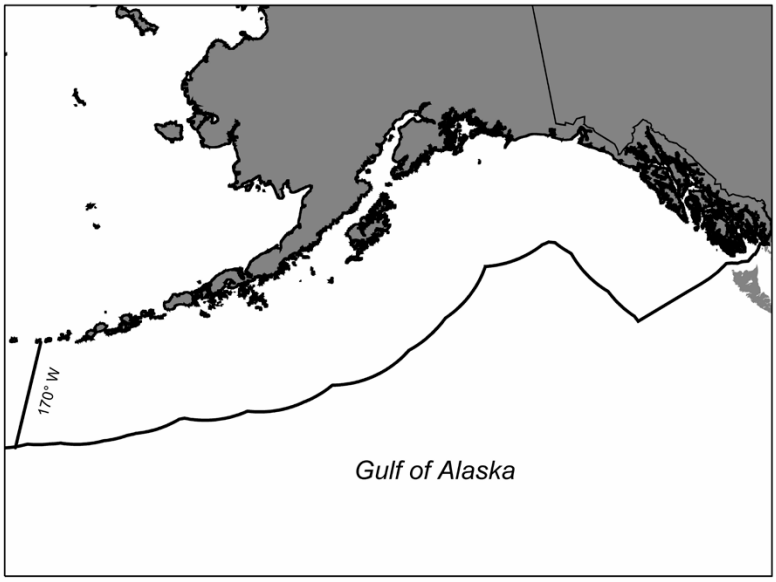


Figure 4. Management area for groundfish in the Gulf of Alaska (GOA FMP, 2019 https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf)

The management area is divided into the following regulatory areas: Western, Central, and Eastern. The Central regulatory area is divided into two districts: Chirikof and Kodiak. The Eastern regulatory area is also divided into two districts: West Yakutat and Southeast Outside. The regulatory areas are illustrated in Figure 5.

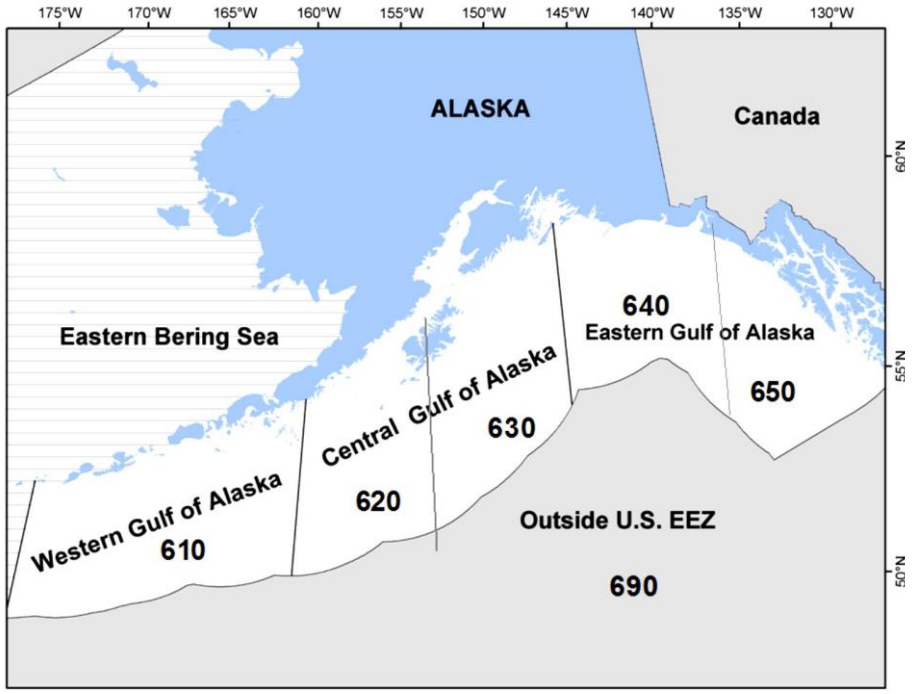


Figure 5. Regulatory areas in the Gulf of Alaska (Source GOA FMP, 2019).

In Alaskan state waters (within 3 nautical miles of the shoreline), fisheries are managed by the State. While the majority of flatfish is taken outside of state waters there are some instances where flatfish are targeted within 3 nautical miles, primarily in the eastern GOA. These are referred to as "parallel fisheries", with the total allowable catches (TACs) being counted against the federal TAC and the state

adopting federal rules and management actions. Figure 6 shows what species of groundfish are managed in all state waters

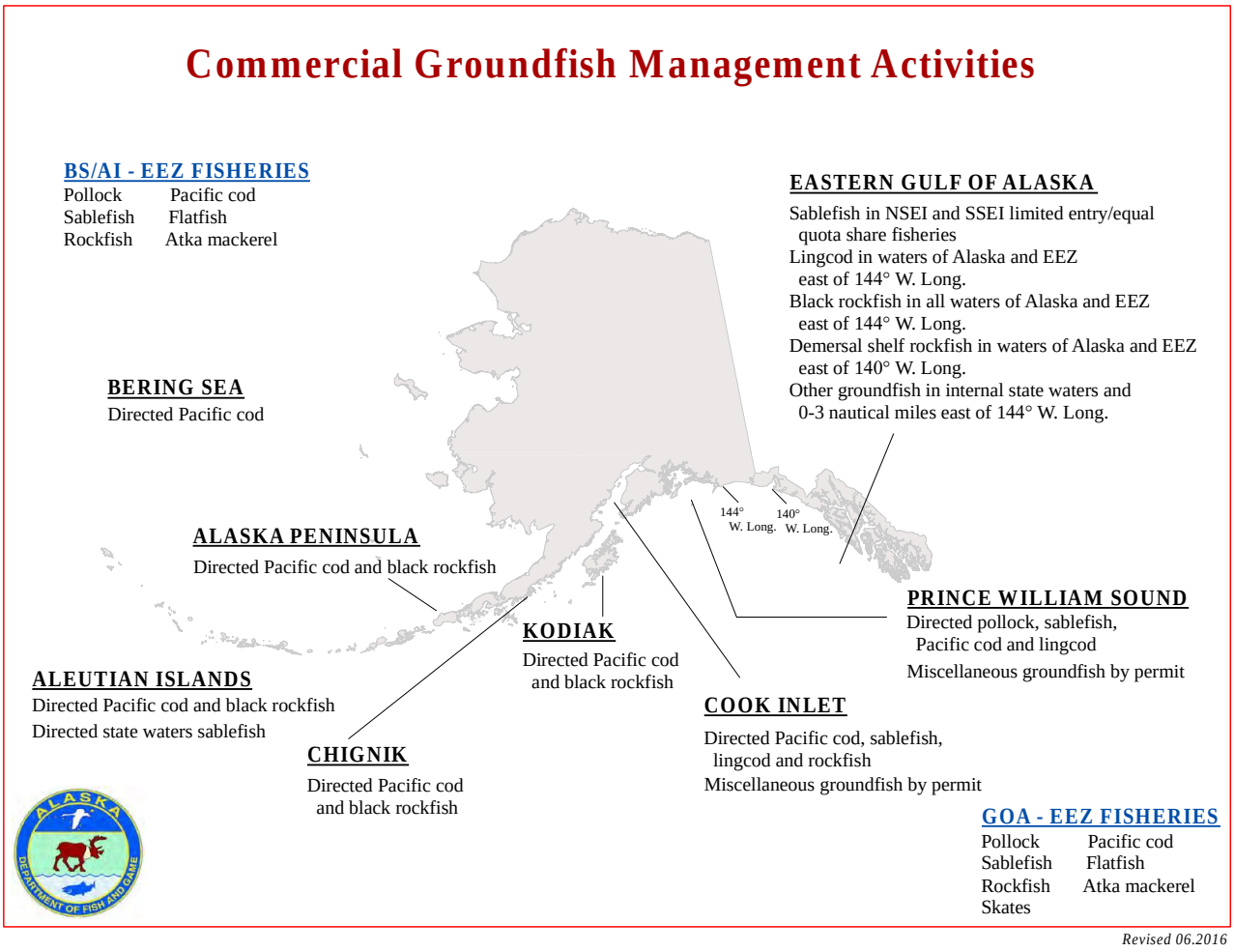


Figure 6. Alaska State waters commercial groundfish management areas. (Source: ADFG https://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.groundfishmaps_management)

3.1.1 Fishery sector landings and the general economic situation of the fishery

The following section on the economics of the fishery are from the, "Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area : Economic Status of the Groundfish Fisheries off Alaska 2017", by Fissel et al[1], 2019.

Alaska's groundfish fisheries are managed by two separate but complimentary fishery management plans (FMPs): the BSAI FMP and GOA FMP. Each FMP covers six major species (complexes); Alaska pollock, Pacific cod, sablefish, Atka mackerel, the flatfish complex, and the rockfish complex, plus Pacific halibut (which is not an FMP groundfish[2]).

[1] Fissel et al. 2019. https://www.fisheries.noaa.gov/resource/data/2017-economic-status-groundfish-fisheries-alaska

[2] An FMP fishery is one where management, including total catch, is carried out under a federal Fishery Management Plan. Pacific halibut is not an FMP groundfish fishery and its total catch is set by the International Pacific Halibut Commission, though allocation of the catch among users is managed by the NPFMC and NMFS.

The flatfish complex is comprised of a number of different species. The species targeted vary substantially by region. In the BSAI, the primary target species are yellowfin sole, rock sole, flathead sole, and arrowtooth flounder, which are mostly fished by catcher/processors in the Amendment 80 fleet[3]. In the BSAI, the yellowfin sole fishery is the largest of the flatfish fisheries. In the BSAI in 2017, retained catch across all species decreased 6%, to 199,000 mt. Decreased catch occurred for yellowfin sole (2%), rock sole (22%), flathead sole (10%), arrowtooth (38%), and Kamchatka flounder (8%), while catch increased for Greenland turbot (26%) and other flatfish (25%). Catches in 2017 were comparable to the average catch level since 2003. Decreases in the BSAI flatfish catch may be associated with increases in the Atka mackerel TAC and catch as Amendment 80 vessels prioritise the more highly valued Atka mackerel over flatfish.

In the GOA, arrowtooth is the primary target species, though other flatfish (e.g., flathead sole and rex sole) are caught in smaller quantities. GOA flatfish are caught by the western and central gulf trawl fleets which are comprised of both shoreside catcher vessels and at-sea catcher/processors. In the GOA retained catch for all flatfish species increased 18%. This change was the result of a 40% increase in arrowtooth catch, with catches of other flatfish species in the GOA decreasing. Arrowtooth, the largest flatfish fishery in the GOA, can show considerable year over year catch variability, in part because of regulatory changes[4].

Flatfish are primarily processed into head & gut (H&G) and whole fish product forms and changes in production largely reflect changes in catch. Processed products are primarily exported to China and South Korea, though a significant share of this product is re-processed into fillets and re-exported to North American and European markets. First-wholesale value in the BSAI flatfish fisheries increased 15% with a 22% increase in price[5]. Yellowfin sole value rose 18% with a 19% increase in price. Increasing prices for other species in the BSAI flatfish fisheries resulted in increasing value despite decreases in production from reduced catch. First-wholesale value in the GOA flatfish fisheries increased 71% with a 24% increase in price. Arrowtooth value rose 139% with a 40% increase in price. Demand for flatfish in general through 2017 and 2018 has remained stable throughout European and North American markets and there are signs of growth in Asian markets.

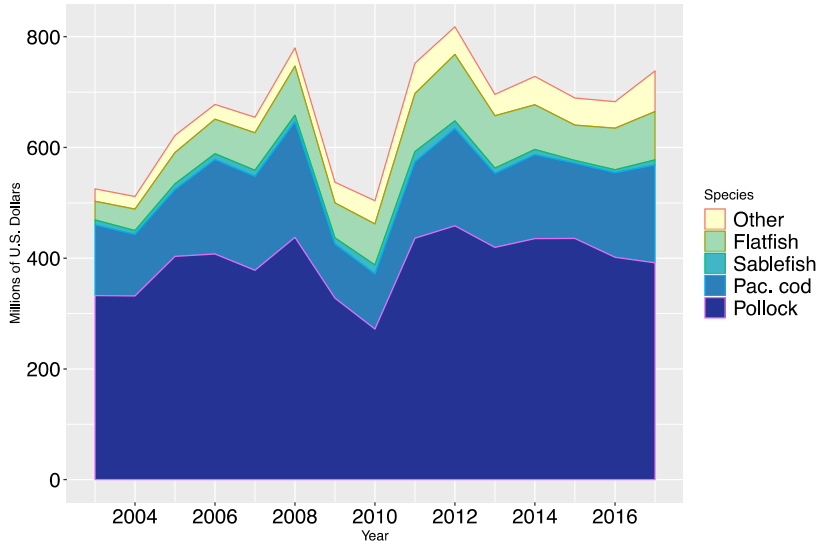


Figure 7. Ex-value of the groundfish catch in the fisheries in the BSAI area by species, 2003-2017.

[3] Amendment 80 was approved by the NPFMC 2006, and enabled the formation of fishery cooperatives for trawl catcher/processors (CPs) that are not eligible under the American Fisheries Act (AFA) to participate in directed pollock fisheries see further information in sub-clause 3.2.1

[4] In 2014, Amendment 95 (regulations to reduce GOA halibut PSC limits) implemented changes to the accounting of halibut PSC sideboard limits for Amendment 80 vessels that allowed the fleet to increase their groundfish catch, mostly arrowtooth flounder. Also, Amendment 95 revised halibut PSC limit apportionments used by trawl catcher vessels from May 15 through June 30 that extended the deep-water species fishery allowing for an increase in arrowtooth flounder catch for this fleet (for details see http://alaskafisheries.noaa.gov/frules/79fr9625.pdf).

[5] Because BSAI flatfish are primarily targeted by catcher/processor vessels there is not an substantive ex-vessel market for them.

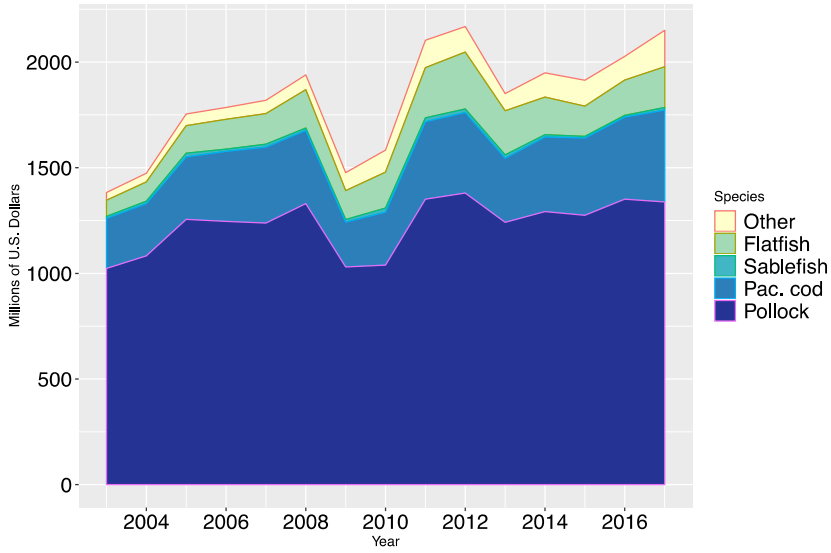


Figure 8. Gross product vale of the groundfish catch in BSAI area by species 2003-2017

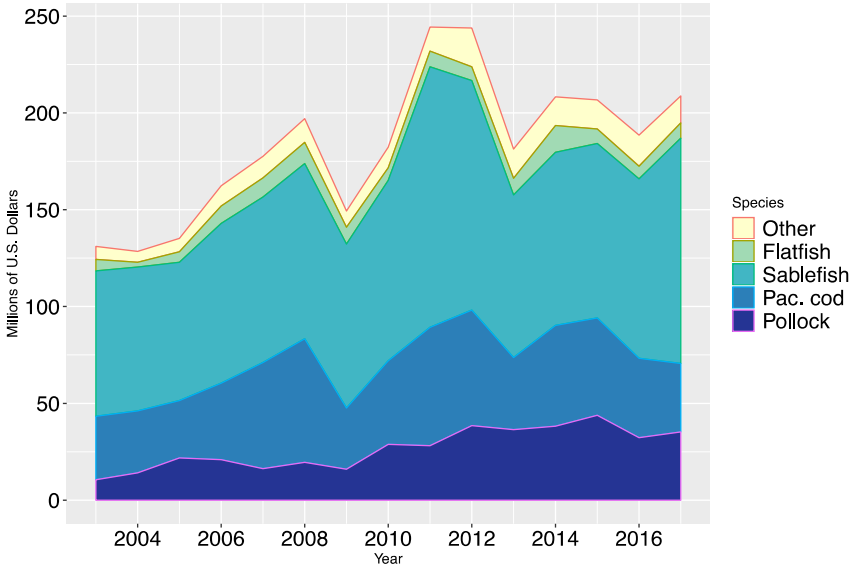


Figure 9. ex-value of the groundfish catch in the commercial fisheries in the GOA area by species, 2003-2017

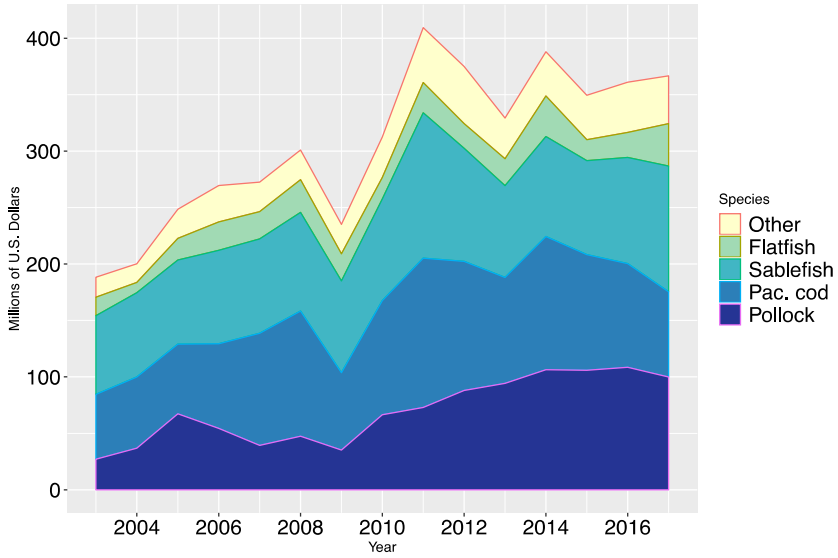


Figure 10. Gross product value of the groundfish catch in the GOA area by species, 2003-2017.

Table 3. Reference points for flatfish stocks in the Gulf of Alaska. Biomass and catch are in tons. Catches in last column are either to October, 2018, or projected (estimated by assessment authors) to the end of 2018. Catches for rock sole include both species (northern + southern*). All data are from the draft reports of the 2018 GOA SAFE, referenced below the table, and include female Spawner Biomass and reference point estimates for 2019 from the most recent assessment or update

GOA Stock/ Unit	Tier	Year	Spawner Biomass	B_{MSY}	$B_{35\%}$	$B_{40\%}$	$B_{100\%}$	F_{OFL}	F_{ABC}	OFL	Catch (2018)
Arrowtooth flounder	3a	2019	869,399	N/A	323,625	396,858	924,644	0.238	0.196	174,598	13,649
Flathead sole	3a	2019	89,205	N/A	32,043	36,620	91,551	0.36	0.28	44,865	2,063
Northern rock sole	3a	2019	47,104	N/A	17,985	20,555	51,387	0.462	0.382	20,582	1,923*
Southern rock sole	3a	2019	71,433	N/A	32,731	37,407	93,518	0.326	0.271	22.700	
Rex sole (W-C GOA)	3a	2019	35,066	N/A	16,848	19,255	48,138	0.29	0.23	13,755	1,673
Rex sole (E GOA)	3a	2019	9,006	N/A	3,359	3,839	9,597	0.31	0.25	4,134	2

Table 4. 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, 2018, or projected (estimated by assessment authors) to the end of 2018. All data are from the draft reports of the 2018 GOA SAFE, referenced below the table, and include female Spawner Biomass and reference point estimates for 2019 from the most recent assessment or update.

BSAI Stock/ Unit	Tier	Year	Spawner Bio mass	B_{MSY}	$B_{35\%}$	$B_{40\%}$	$B_{100\%}$ or *B0**	F_{OFL}	F_{ABC}	OFL	Catch 2018
Alaska plaice	3a	2019	186,100	N/A	111,100	126,900	317,360	0.149	0.124	39,880	24,000
Arrowtooth flounder	3a	2019	482,174	N/A	212,183	242,495	606,237	0.161	0.136	82,939	6,387
Flathead sole	3a	2019	153,203	N/A	74,221	84,824	90,534	0.47	0.38	80,918	11,305
Greenland turbot	3a	2019	54,244	N/A	31,687	36,213	126,441	0.21	0.18	11,362	3,758
Kamchatka flounder	3a	2019	54,779	N/A	37,685	43,069	107,673	0.108	0.090	10,965	4,327
Northern rock sole	1a	2019	417,800	186,000	N/A	N/A	*515,680**	0.147	0.144	122,000	28,065
Yellowfin sole	1a	2019	850,600	460,800	N/A	N/A	*1,245,400**	0.118	0.107	290,000	146,500

3.1.2 Overview of the fishery to be certified, including management practices, scientific assessment of the stocks, and a clear definition of the unit of certification being proposed;

The following section uses information from the original certification report (Global Trust, 2014) and by Fissel et al, 2019.

Fishing Method

The vast majority of all of the flatfish in Alaska are caught and landed by trawlers using bottom trawl gear. A trawl is a large, bag-shaped net that is towed by a fishing vessel. The doors serve to keep the mouth of the trawl open as it moves through the water. The flatfish fisheries are prosecuted with bottom trawls typically having a headrope to footrope vertical distance rise of 1 fathoms to 3 fathoms. Nets are constructed of polyethylene webbing with codends and intermediates using 5.5" to 8" mesh. Sweeps are typically 45 fathoms and are made of combination rope or wire. The use of bobbins on the trawl sweeps is a requirement and reduces the impact on the sea bed and reduces bycatch – see Figure 11. Trawlers use sophisticated ultrasonic devices to determine bottom type and fish for species associated with that substrate. Upon locating a likely substrate for the desired species, the vessel trawls through the school and captures the fish. Electronic sensors tell the harvester where the trawl is in relation to the ocean floor, while other sensors report how full the trawl becomes. The net is retrieved using large winches and a power drum upon which the net is rolled as it is brought aboard.

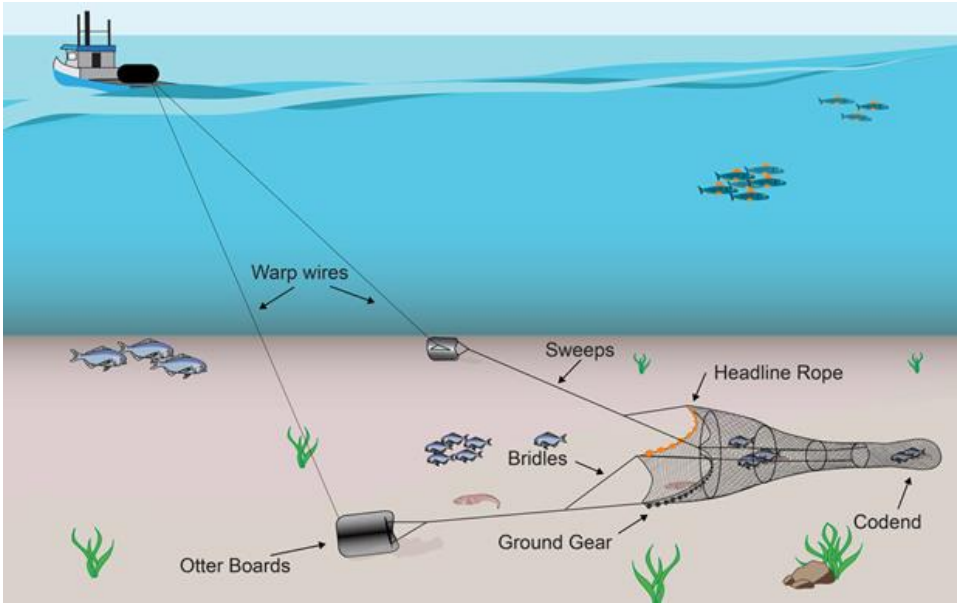


Figure 11. Schematic of a demersal trawl (Source: https://www.afma.gov.au/fisheries-management/methods-and-gear/trawling)

Greenland turbot are fished by both fixed (longline) and trawl gear in a limited access, derby style fishery. Derby style fisheries are based on a certain amount of fish being available to catch by all participants, the idea is to catch the most fish possible before the overall limit is reached. Longliners catch bottomfish via a long line ("groundline") that is laid on the bottom. The freezer longline fleet in the BSAI fishes primarily for Greenland turbot with stationary lines, onto which baited hooks are attached by gangions. Most vessels use swivel gear. The ends of each set are anchored and marked with buoys. The gear is normally set in a straight line. - see Figure 12.

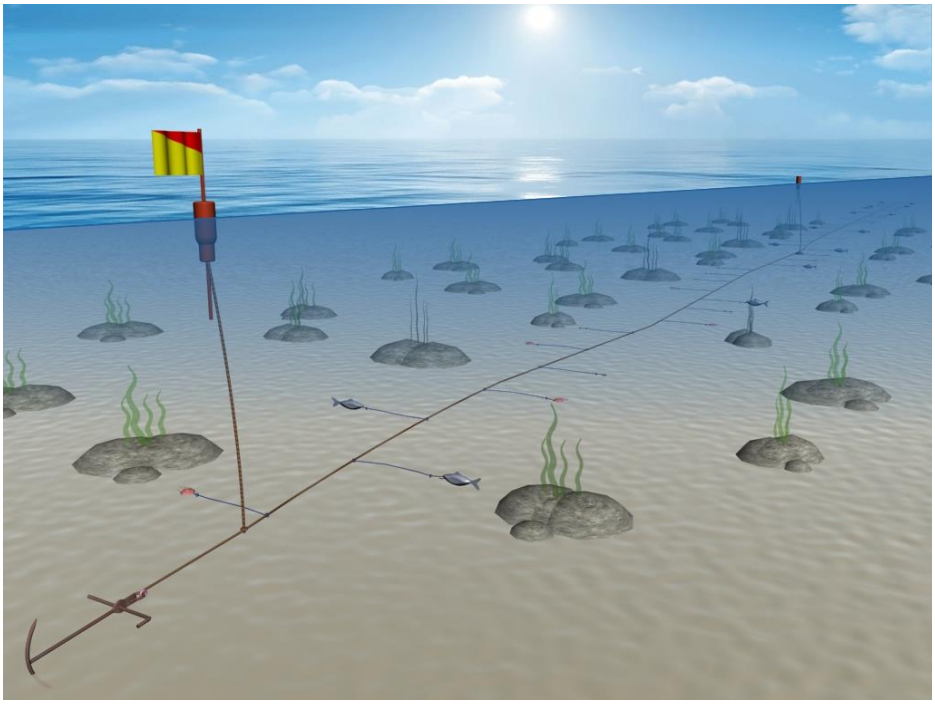


Figure 12. Schematic of a demersal longline (Source: https://www.seafish.org/gear/gear/profile/long-line)

The Fleet

The flatfish fisheries are multispecies fisheries (mainly targeting flatfish, Pacific cod, Atka mackerel, and rockfish to smaller degrees) in which incidental catch species are often an important component of the catch. The BSAI flatfish fishery is almost entirely conducted by non-pelagic trawl catcher processors. Catcher processors utilize onboard equipment to process and freeze the catch. These vessels range in size from 110 to 300 feet, and carry crews of up to 50 people. The majority of the BSAI flatfish catch is harvested by vessels in the Amendment 80 catcher processor fleet. In 2017, 19 vessels operated in the Amendment 80 fleet. Some of these vessels act as motherships, receiving catch from vessels fishing in the BSAI limited trawl access sector.

The remainder of the catch of flatfish species is primarily taken by other trawl vessels, with the notable exception of Greenland turbot. There are a small number of other trawl vessels that harvest flatfish in the Bering Sea. These include vessels of the AFA (American Fisheries Act primarily targeting pollock) trawl catcher processor and the AFA trawl catcher vessel fleets, and other trawl catcher vessels that are not in an AFA cooperative.

In the GOA, flatfish are primarily taken using trawl gear, although, certain species may show up as bycatch on longline gear set for sablefish or Pacific halibut; however, there is no directed longline fishery for flatfish. The flatfish fishery in the GOA is a combination of catcher vessels and catcher processors. The catcher vessels are generally smaller than the catcher processors and tend to deliver their catch to processing plants on shore. The latest figures available indicate approximately 85 vessels fishing the flatfish complex in the GOA. The fleet fishes for a wide variety of species, with target species varying across seasons. The catcher vessels begin the year by targeting Pacific cod, moving on to catch pollock, then other species, including flatfish. Several of the Amendment 80 vessels also participate in the Western GOA fisheries, targeting flatfish, Pacific cod, and rockfish using the same gear they use in the Bering Sea.

3.2 Target species biology

3.2.1 Biological background

The BSAI and GOA flatfish complex subject to certification comprises a suite of 9 species/stocks: BSAI & GOA Arrowtooth flounder (Atheresthes stomias), BSAI Kamchatka flounder (Atheresthes evermanni), BSAI Alaska plaice (Pleuronectes quadrituberculatus), BSAI & GOA Flathead sole (Hippoglossoides elassodon), BSAI & GOA Northern rock sole (Lepidopsetta polyxstra), BSAI Yellowfin sole (Limanda aspera), BSAI Southern rock sole (Lepidopsetta bilineatus), GOA Rex sole (Glyptocephalus zachirus) and BSAI Greenland turbot (Reinhardtius hippoglossoides). Studies of the life histories, influence of environmental and trophodynamic conditions on the various aspects of stock productivity and distribution, and impacts of fisheries on distribution and biology have been conducted for decades and continue to accumulate for all the flatfish species. The NOAA SAFE reports were used as main sources of background information on the species' biology and fisheries, augmented by past MSC Certification assessment reports and new literature accumulated since the last MSC certification assessment. Also the Bearing Sea and Aleutian (hereafter BSAI) Islands Guolf of Alaska (hereafter GOA) Fishery Management Plans (hereafter FMPs) were used for source of information in the present report.
It is important to stress that some flatfish, may experience range extension or stock level increases due to climate drivers. Commercially valuable flatfish stocks are under-going changes in distribution, abundance, and behaviors. Any projections for stock abundances in the future are very tentative, and observed trends may be specific to regions or locations. Major abundance shifts, if they do occur, will develop over a period of decades (see: https://alaskaseagrant.org/wp-content/uploads/2018/02/Climate-Change-and-Fisheries_Johnson_WEB.pdf).

Arrowtooth Flounder (Atheresthes stomias). Large flatfish widespread in the eastern and northern Pacific, with a range from central California to Bering Sea. They are the most abundant flatfish in much of the EBS and Gulf of Alaska, but abundance declines along the Aleutian Islands, and at depths deeper than 200 m down to approximately 500 m. Habitat preference is for soft bottoms, but is widespread among gravel, sand and mud bottom types. Stock structure as not been studied in detail, but no distributional discontinuities have been found in either the EBS or between the EBS and other parts of its range. Moreover, studies of the pattern of changing abundance in space and time have shown the changes are the result of complex interacting processes of at least density dependence (expansion into less preferred substrate types at high densities) and water temperatures, but do not support the hypothesis that there are isolated subpopulations within the management unit within the management unit.
Although in the 1980's a complex of related flatfish species was managed as a unit, in 1986 Greenland turbot were split off as a separate species for monitoring, assessment, and management. In 1992 Kamchatka flounder (A. evermanni) were also identified separately in the research surveys and separated for separate catch monitoring in 2007 and management in 2011. Since 2011 in BSAI, the arrowtooth flounder and Kamchatka flounder have been managed separately. Juvenile arrowtooth flounder are predominantly found in shelf waters until age 4, but begin to move over the slope at around age 4. Older ages occupy both shelf and slope waters, with some annual change in preferred depths (deeper in winter). Moreover, survey catches suggest that the proportion of the stock over the slope or on the shelf may vary greatly among years. This could either suggest there are oceanographic drivers to some of the distribution information we have or that age/size changes in population structure over time can interfere with the ability to detect seasonal depth migrations. Beyond age 9 there are no further systematic changes in proportion of the population in the shelf and slope. However, on average approximately 50% the population of mature, older individuals is still found on the shelf, with no population substructure clearly visible. Based on data from the1980s, recruitment to the adult population extends over several years.
The age of 50% maturity has been estimated at approximately 7 years of age, and is length dependent. Early studies found the size of 50% maturity was 46.9 and 42.2 cm (males and females respectively), and recent data on only females suggested the size at 50% maturity may have increased by 10-15%). Maximum age is estimated to be around 15 years, somewhat younger than several of the other BSAI flatfish. Analyses have found a correspondingly higher natural mortality of around 0.2 for females and males 35% higher. Neither maximum age nor natural mortality has been thoroughly validated by tagging and other directed studies, but the set of life history parameters appear coherent in assessments. Spawning occurs from December through February but may extend longer into the spring than for other BSAI flatfish, and tends to be in more offshore or deeper portions of their range. A strong density dependence of recruitment has been documented. However this is combined with a strong effect of interannual differences in lower trophic level productivity and wind-borne advection of larvae and young

of the year to shallower nursery areas, with higher productivity and more on-shore advection favoring stronger recruitment. As abundance of arrowtooth flounder has increased over the two recent decades, a reduction in annual recruitment consistent with a density dependent has continued to be seen, and documentation of a contribution of the Arctic Oscillation to bottom-up productivity has strengthened.
Because of their abundance and increasingly piscivorous diet with size, arrowtooth flounder are an important predator in the BSAI. They prey heavily on juvenile pollock, but take a wide range of other fish and macroinvertebrates. Their high abundance can make them a major source of predation mortality on their more common prey, but they have not been shown to have a sufficiently high dependence on any single prey that variation in the abundance of any one prey will directly affect the feeding or growth of arrowtooth flounder. Studies in the Gulf of Alaska have found them at least locally important as a prey of stellar Sea lions. There are two stocks of arrowtooth flounder in the west coast of US: Bering Sea/Aleutian Islands and Gulf of Alaska arrowtooth flounder, which are assessed and managed separately.

Kamchatka Flounder (Atheresthes evermanni). This flounder is a relatively large flatfish found primarily in the northwest Pacific Ocean. Distribution records are available from Northern Japan through the Sea of Okhotsk to the Western Bering Sea. Range continues particularly along the Aleutian Island chain, to the eastern Bering Sea shelf and south of the Alaska Peninsula at probably a decreasing abundance eastward. The northern limit of records is Anadyr Gulf. In the eastern Bering Sea and Gulf of Alaska, the range of Kamchatka flounder overlaps with arrowtooth flounder (Atheresthes stomias). The two species are morphologically very similar and were not routinely distinguished in survey catches before 1992 and in the commercial catches until. The two species were managed as a complex until 2010. However, at that time a directed fishery for Kamchatka flounder developed in the BSAI management area. This posed a challenge for managing the two species together, because the ABC was comprised 93% of arrowtooth flounder. In fact, the combined ABC actually exceeded the survey-based estimates of Kamchatka flounder biomass, so the high combined TAC presented a large opportunity for overharvesting the targeted Kamchatka flounder. Thus, since the 2011 fishing season, arrowtooth flounder and Kamchatka flounder have been assessed and managed separately. Although the arrowtooth and Kamchatka flounder differ greatly in abundance in BSAI, many life history parameters are similar between the species, and typical of the genus Atheresthes. Size at age is similar, at least until the two species reach sexual maturity. Thereafter age at length calculations from a small sample collected in 1991 indicate that males and females exhibit divergent growth with females growing larger than males.
Maximum document age of Kamchatka flounder is 33 years, similar to the life expectancy of most other Bering Sea flatfish. Natural mortality is estimated to be between 0.10 and 0.15, depending on the method used.
Spawning and recruitment has not been well studied for Kamchatka flounder in BSAI. Sampling of commercial catches has documented that spawning occurs in deeper slope waters along the Aleutian Islands and deeper shelf and slope waters of the outer Bering Sea. Spawning is primarily in winter, when fisheries are not targeting either species of Atheresthes due to challenging fishing conditions and poor market quality of the flesh. Less is known of the location of nursery grounds, but they are thought to be also in deeper waters along the Aleutian Islands and outer edge of the Bering Sea. Recruitment variation has been inferred from assessment results, and neither dominance in the stock of occasional very strong cohorts nor highly different productivity regimes have been documented. The high relative biomass levels estimated in the assessment are consistent with a relatively large stock receiving regular but modest recruitment.
There is no evidence of large scale seasonal migrations, although there may be a movement to greater depths for spawning. However, the surveys are standardized in time, so they would be a weak source of information on movements, and the fishery is affected by seasonal weather conditions, so the modest differences in catch locations at different seasons cannot be taken as evidence that the stock has moved significantly. Few predators have been documented for Kamchatka flounder although individuals have been found in the stomachs of Pacific cod, pollock, Pacific halibut, arrowtooth flounder, and two sculpin species. The challenges of differentiating small individuals from the more common arrowtooth flounder means the predation estimates have high uncertainty, but by the time individuals reach 3 years, the species complex is rare in predator stomachs. The primary diet data come from older studies, and generally opportunistic sampling. Younger ages of walleye pollock comprise from half to over 80% of stock contents with macro-invertebrates such as shrimp (most Crangonidae) and euphausiids also sometimes common. The diet overlap with arrowtooth flounder indicated that these two congeneric species basically consume the same resources.

Alaska Plaice (Pleuronectes quadrituberculatus). Alaska plaice is widespread on the continental shelf of the BSAI, preferring depths under 200m but occasionally taken up to 600 meters deep. Juvenile

Alaska plaice are found predominately in waters less than 50 m, with depth range increasing with size and age.
The eastern boundary of their range is from the Gulf of Alaska to the Sea of Japan in the west. Their range extends further to the north than many of the other BSAI flatfish, with an opportunistic survey finding nearly 40% of the estimated biomass north of St, Lawrence Island, and the species recorded regularly in the Chukchi Sea. On the other hand Alaska plaice are uncommon along the AI, near the southern limit of their range. Higher abundances are found in the EBS than in other parts of their range, but absolute abundance may be increasing in at least all US waters. There is no evidence of range discontinuities that would suggest the presence of multiple stocks, but a thorough analysis of detailed stock structure as not been undertaken.
Prior to 2002, Alaska plaice were managed as part of the "other flatfish" complex, and some portion of the apparent increase in abundance may result from more careful identification of the species in research surveys. In addition Alaska plaice are grouped with the rock sole, flathead sole, and other flatfish fisheries under a common prohibited species catch (PSC) limit, with seasonal and total annual allowances of prohibited species bycatch by these flatfish fisheries applied to the fisheries within the group. Changes in how bycatches have been managed in 2007 and changes being implemented in observer programs in 2014 and 2015 may affect the information from the commercial fisheries regarding Alaska plaice.
Alaska plaice are found predominantly on mixed sand and mud bottoms, and can tolerate below zero water temperatures because of the presence of an antifreeze protein in their blood. Density dependence and water temperature both have some influence on the local distribution of Alaska plaice, but the relationships have very wide confidence intervals. Fisheries rarely direct for Alaska plaice and retention rate may be low because of weak market conditions, so distributional information comes mostly from research vessel surveys, which rarely sample the northern part of their range, or beyond the US EEZ to the west.
Consistent with being a "cold water" flatfish, growth rates are relatively slow, but life expectancies long. Asymptotic length of around 400 mm for males and 500 mm for females are reached after around 20 years, but individuals ages to 40 years are frequently encountered in the surveys. Age of 50% maturity is reached at approximately 6-7 years and 310 mm for females. Environmental conditions have been found to affect growth rate, with colder temperatures associated with slower growth. Consistent with the relatively long lifespan of Alaska plaice, the annual natural mortality rate was estimated at 0.13 for both sexes, a lower value than was assumed in earlier decades.
Alaska plaice produce pelagic eggs and larvae that are dependent upon oceanic currents for transport to suitable nursery habitat areas which are essential for recruitment success. In the eastern Bering Sea, spawning occurs during the months of April through June over a wide area of the middle continental shelf. From examining the age composition of survey catches recruitment has been inferred to show regimes and relative lower and higher productivities n Estimated recruitment was declining from 1981-1997, but improving since 1997 with above average strength recruitment in 1998 and exceptionally strong recruitment in 2001 and 2002. With low fishing and natural mortality these regimes are inferred to reflect more favorable and unfavorable environmental conditions, consistent with the documented influence of transport processes on eggs and larvae. Alaska plaice feed mostly on polychaetes, but also eat amphipods, echiurans and many other macro-invertebrates. Most feeding is on benthic infauna and epifauna, with little pelagic feeding. A wide variety of predators have been found to have Alaska plaice in their stomachs, but none have been found to have a strong dependence on the species as a major forage species.

Flathead Sole (Hippoglossoides elassodon). "Flathead sole" are managed as a two-species complex consisting of true flathead sole (Hippoglossoides elassodon) and its morphologically-similar congener Bering flounder (H. robustus). More than 90% of the combined biomass is true flathead sole. There is no evidence that the fishery intentionally targets either species in the complex, although because true flathead sole are so dominant by biomass and numbers in the complex, the tendency for commercial fisheries to seek higher catch rates may make the true flathead sole somewhat over-represented in the catches. "Flathead sole" was included in the "other flatfish" until 1994, when changes in the management of BSAI flatfish fisheries that were intended to increase retention led to a request for a separate ABC and OFL for the "flathead sole" complex. The implementation of Amendment 80 in 2008 further constrained the operation of flatfish fisheries, particularly with regard to bycatch and mixed-species practices. Until that amendment to the BSAI Groundfish Management Plan, the flathead sole directed fishery was often constrained by the halibut bycatch caps, and consequently suspended or closed prior to attainment of the TAC. Since the implementation of Amendment 80, the fishery has never reached its in-season halibut bycatch limits. In addition, whereas before the Amendment 30% or more of flathead sole were discarded in various EBS fisheries, recent discard rates have been 15% or less.

Northern Rock Sole (Lepidopsetta polyxystra). Northern rock sole is part of a two-species rock sole complex, along with southern rock sole (L. bilineata). Although the two species can be separated morphologically, care in species identification is needed and historical records often do not differentiate them at all, or are of questionable reliability. Prior to 1987, both species of rock sole were managed in a larger species complex with several other flatfish species, and commercial records prior to that date are even less reliable than more recent ones. The total range for the two species are the North Pacific, from Baja California around to Japan, with centers of abundance off the Kamchatka Peninsula, British Columbia, the central Gulf of Alaska, and in the south-eastern Bering Sea. The northern rock sole overwhelmingly predominates over southern rock sole in the eastern Bering Sea continental shelf and is present in much lesser amounts in the Aleutian Islands region.

Adults exhibit a benthic lifestyle and seem to occupy separate winter (spawning) and summertime feeding distributions on the south-eastern Bering Sea continental shelf. They have been taken at depths down to over 500 meters, but they are predominately found at depth of 0-200 meters. Finer scale distribution reflects influences of both density, with wider distribution at higher abundances, and environmental conditions. Adults are closely associated with the seabed, preferring softer substrates consisting of sand, gravel, and cobble. Larvae and early juveniles are found in the pelagic water column, but generally in waters of 200m or shallower.

Male and female rock sole grow similarly until about age 6 after which females grow faster and larger than males. Asymptotic weight is not reached until the mid to late teens in both sexes, at around 400 gm for males and 800 gm for females. Length-at-age over time shows periods of slow and fast growth since the early 1980s. Length at age declined during the 1980s, during a period of increasing abundance and density of rock sole in EBS. Length at age of younger ages increased slightly in the 1990s and 2000s, but has either declined or remained stable for ages past maturity. Both environmental conditions and density dependence have been shown to have influenced these trends, with years of particularly cold bottom temperatures associated with slower growth rates for both sexes.

Maturity is at least partially size dependent, with age of 50% maturity for both females and males at 8-12 years, and males possibly maturing slightly earlier than females. Spawning takes place during from December through March, and the main targeted fishery for northern role sole occurs during this period, to harvest the roe. After spawning the eggs are pelagic, and advection processes transport them to more inshore areas. Prior to regulatory changes in 2000, rock sole were largely discarded outside the spawning season, but since 2000 retention has been at least 90%.

Recruitment has varied over the past 30 years, with periods of higher and lower productivity. There was a period characterized by sustained above-average year-classes from 1980 to 1988, which recruited to the fishable and spawning biomasses in the second half of the 1980s and first half of the 1990s. Both a lesser density dependence and favourable advection and water temperatures for young rock sole may have contributed to the period of higher productivity. The years after 1995 were a period of below average recruitment to the adult portion of the population followed by increased recruitment in 2001-2005. Several year classes in the 2000s appear average to above average. Although the weaker year classes in the later 1990s may reflect effects of increasing density dependence on recruitment. Large recruitments of northern rock sole that occurred at a low spawning stock size in the 1980s suggest that under proper environmental conditions the stock can be highly productive at a smaller stock size. These observations are influential on estimation of reference points (BMSY = 260,000 t), with the result that FMSY is highest when fitting the full data set. Year classes and particularly the more recent average to good year classes are also likely to reflect a generally favourable climatic regime, as spawning biomass has been average to above average, with research results documenting effects of transport processes and temperature on year-class strength. The maximum age for EBS northern rock sole has been in the mid-twenties, consistent with a natural mortality rate slightly less than 0.2, which is typical of flatfish with similar growth rates and maximum ages.

Rock sole diet by life stage varies as follows: Larvae consume plankton and algae, early juveniles consume zooplankton, late juvenile stage and adults prey includes bivalves, polychaetes, amphipods, molluscs and miscellaneous crustaceans. Major fisheries do not target any of these prey. A number of predatory fish consume juvenile and smaller adult adults, including pollock, Pacific cod, halibut, yellowfin sole, and skates, but rock sole are not considered a major prey of any of those predators.

Yellowfin Sole (Pleuronectes asper, also known as Limanda aspera). The yellowfin sole (Limanda aspera) is one of the most abundant flatfish species in the eastern Bering Sea (EBS) and is the target of the largest flatfish fishery in the world. They inhabit the EBS shelf and are considered one stock. Abundance in the Aleutian Islands region is negligible. Yellowfin sole are distributed in North American waters from off British Columbia, Canada, (approx. lat. 49° N) to the Chukchi Sea (about lat. 70° N) and south along the Asian coast to about lat. 35° N off the South Korean coast in the Sea of Japan. Densities in preferred habitats of the EBS are as high as or higher than densities in other parts of their range.

Adults exhibit a benthic lifestyle and occupy separate winter, spawning and summertime feeding distributions on the eastern Bering Sea shelf.
From over-winter grounds near the shelf margins, adults begin a migration onto the inner shelf in April or early May each year for spawning and feeding. In recent years, the directed fishery has typically occurred from late winter through autumn, once spawning has been completed. Yellowfin sole are managed as a single stock in the BSAI management area as there is presently no evidence of stock structure. Yellowfin sole Essential Fish Habitat (EFH; waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity) have been described for the late juvenile and adult stage of its life cycle: EFH for late juvenile and adult yellowfin sole is the general distribution, located in the lower portion of the water column within nearshore bays and along the inner (0 to 50 m), middle (50 to 100 m), and outer (100 to 200 m) shelf throughout the BSAI wherever there are soft substrates consisting mainly of sand. The association of yellowfin sole with soft substrates has been well documented with fishery, survey, and research data. The areas of preferred substrate and depths are widely distributed from coastal areas to approximately the end of the Alaska Peninsula in the south, and running north-westerly nearly to St. Lawrence Island. Yellowfin sole are reported to be found in high densities in some nearshore coastal waters as well as further offshore, and these concentrations are outside the areas surveyed in research surveys, although there is some commercial take of these concentrations, at least in some years.
The previous MSC certification assessment reported growth curve parameters of the von Bertalanffy growth curve for yellowfin sole from 12 years of combined data have been estimated for the age range 3-16 years as follows: Linf (cm)= 35.8; K=0.147; t0=0.47 (Moody International 2010). Stock assessments since that publication report some variation in growth parameter, but no systematic trends are apparent, and the variation is well within historical ranges. Thus, the growth curve remains the primary basis for estimating age information, but their treatment in the assessment computations is becoming more sophisticated (see below). Like other flatfish, maturation seems to be size-dependent in yellowfin sole. Estimated age of 50% maturity is 10.5 years at average growth rates based on 1992-1993 survey data. Re-analysis from gonad collection of 2012 show similar results). In the case of most north Pacific flatfish species, including yellowfin sole, sexual maturity occurs well after the age of entry into the fishery. Yellowfin sole females are 82% selected to the fishery by age 10 whereas they have been found to be only 40% mature at this age. Annual natural mortality of adults has been estimated to be about 10% (M = 0.12).
As studies accumulate about the impact of oceanographic conditions of BSAI fish, a component of the variation in growth rate of several flatfish species, including yellowfin sole is attributed to variation in water temperature and oceanographic regime. As studies of these regime and regime-like variability in growth parameters continue, there may be opportunity in future to increase the ability to address variation in annual growth within the stock assessments.
Oceanographic conditions have been found to have large effects on recruitment rate for almost all the EBS flatfish where studies have been conducted. However, directed studies of oceanographic conditions on yellowfin sole where not found, and recruitment to yellowfin sole has been relatively stable for some years. Nevertheless both density dependent and independent effects were found to affect their distribution. However, given the ubiquity of such effects in EBS species and the documented effects of oceanographic conditions on growth and distribution, recruitment impacts should not be discounted, although at stock sizes and exploitation rates of recent decades, recruitment variation would not be a major short term factor in assessment or management.
With regard to diets, yellowfin sole appear to be typical of the generalist flatfish feeding on largely soft-bodies benthic infauna and epifauna. They are preyed by a range of large piscivorous fishes, including Pacific cod and large Alaska Pollock, but no predators have been reported as dependent on juvenile or adult yellowfin sole as a specialized prey.

Southern rock sole (Lepidopsetta bilineata). The Southern rock sole is a flatfish of the family Pleuronectidae. It is a demersal fish that lives on sand and gravel bottoms at depths of up to 575 m, though it is most commonly found between 0 and 183 m. Its native habitat is the temperate waters of the northern Pacific, from Baja California to Alaska, the Aleutian Islands and southeastern parts of the Bering Sea. It grows up to 60 cm in length and can weigh up to 1.8 kilograms, and has a maximum recorded lifespan of 22 years. Southern rock sole ranges from the southeast Bering Sea to Baja California. This species have an overlapping distribution in the Gulf of Alaska with northern rock sole. Southern rock sole spawns in areas where bottom temperatures averaged 6°C in June.

Rex sole (Glyptocephalus zachirus). The species is a right-eyed flatfish occurring from southern California to the Bering Sea and ranging from shallow water (<100m) to about 800 meters depth. They

are most abundant at depths between 100 and 200m and are found throughout the Gulf of Alaska (GOA), with the highest biomass found in the Central GOA.
Rex sole appear to exhibit latitudinal changes in growth rates and female size at maturity between stocks in the GOA and off the coast of Oregon. Size at sexual maturity was greater for fish in the GOA than in Oregon, as was size-at-age. However, these trends offset each other such that age-at-maturity was similar between the two regions.
Rex sole are batch spawners with a protracted spawning season in the GOA. The spawning season for rex sole spans at least 8 months, from October to May. Eggs are fertilized near the sea bed, become pelagic, and probably require a few weeks to hatch. Hatched eggs produce pelagic larvae that are about 6 mm in length and are thought to spend up to 9 months in a pelagic stage in the northern GOA before settling out to the bottom as 5 cm juveniles. Rex sole are found offshore in the GOA during the spawning season and larvae are broadly distributed over the slope and shelf. Rex sole are one of several GOA flatfish species with larvae that exhibit cross-shelf transport, moving to several nearshore nursery areas where they remain as juveniles. Several flatfish species in the Gulf of Alaska, including rex sole, Dover sole, Pacific halibut, and arrowtooth flounder have shown synchrony in recruitment patterns over time that have been linked to an environmental indicator related to sea surface height.
Rex sole are benthic feeders, preying primarily on amphipods, polychaetes, and some shrimp. In 1993 rex sole was split out of the deep-water management category because of concerns regarding the Pacific ocean perch bycatch in the rex sole target fishery. The stock within the GOA is managed as a unit stock but with area-specific ABC and TAC apportionments to avoid the potential for localized depletion. Little is known on the stock structure of this species. However, otoliths exhibit two distinct growth patterns and data shown in this assessment show that length older ages in the Eastern GOA is smaller than those for the Western and Central areas.

Greenland turbot (Reinhardtius hippoglossoides). This flatfish has a circumpolar distribution inhabiting the North Atlantic, Arctic and North Pacific Oceans. The American Fisheries Society uses "Greenland halibut" as the common name for Reinhardtius hippoglossoides instead of Greenland turbot. To avoid confusion with the Pacific halibut, Hippoglossus stenolepis, the common name Greenland turbot, which is also the "official" market name in the US and Canada, is retained.
In the Pacific Ocean, Greenland turbot have been found from the Sea of Japan to the waters off Baja California. Specimens have been found across the Arctic in both the Beaufort and Chukchi seas. This species primarily inhabits the deeper slope and shelf waters (between 100 m to 2000 m) in bottom temperatures ranging from -2°C to 5°C. The area of highest density of Greenland turbot in the Pacific Ocean is in the northern Bering Sea. Juveniles are believed to spend the first 3 or 4 years of their lives on the continental shelf and then move to the continental slope. Adult Greenland turbot distribution in the Bering Sea appears to be dependent on size and maturity as larger more mature fish migrate to deeper warmer waters. In the annual summer shelf trawl surveys conducted by the Alaska Fisheries Science Center (AFSC) the distribution by size shows a clear preference by the smaller fish for shallower (< 100 m) and colder shelf waters (< 0°C). The larger specimens were in higher concentrations in deeper (> 100 m), warmer waters (> 0°C). It appears that for years with above average bottom trawl bottom temperatures the larger turbot (> 20 cm) are found at shallower depths. Juveniles are generally absent in the Aleutian Islands regions, suggesting that the population in the Aleutians originates from the EBS or elsewhere. In this assessment, Greenland turbot found in the two regions are assumed to represent a single management stock. NMFS initiated a tagging study in 1997 to supplement earlier international programs. Results from conventional and archival tag return data suggest that individuals can range distances of several thousands of kilometers and spend summer periods in deep water in some years and in other years spend time on the shallower EBS shelf region. Greenland turbot are sexually dimorphic with females achieving a larger maximum size and having a faster growth rate. Data from the AFSC slope and shelf surveys were pooled to obtain weight at length and growth parameters for both male and female Greenland turbot. This sexually dimorphic growth is consistent with trends observed in the North Atlantic. Collections in the North Atlantic suggest that males may have higher mortality than females. Evidence from the Bering Sea shelf and slope surveys suggest males reach a maximum size much smaller than females, but that mortality may not be higher than in females. Prior to 1985 Greenland turbot and arrowtooth flounder were managed together. Since then, the Council has recognized the need for separate management quotas given large differences in the market value between these species. Furthermore, the abundance trends for these two species are clearly distinct.

3.3 Scientific stock assessment

BSAI arrowtooth flounder The Bering Sea and Aleutian Islands (BSAI) arrowtooth flounder (*Atheresthes stomias*) stock is managed in Tier 3a and is assessed on a biennial basis. Survey data for the BSAI comes from the BSAI shelf survey which takes place annually, the Aleutian Islands survey which is biennial, and the BSAI slope survey which is also typically biennial. In even years a full assessment of arrowtooth flounder (ATF) in the BSAI is conducted. On odd years, parameter values from the previous year's assessment model http://www.afsc.noaa.gov/REFM/Stocks/assessments.htm) and total catch information for the current and previous year are used to make projections and to recommend ABC and OFL for the following two years. A single species projection model was used to predict the status of the BSAI ATF stock for 2018 and 2019 and to calculate ABC and OFL for those years. The projection model incorporated parameter values from the 2016 assessment model as well as catch information from 2016 and 2017.

The estimate of total biomass in 2018 is higher than was estimated in the 2016 full assessment, 784,989 t vs. 772,153 t due to lower catch in 2017 than was predicted in 2016 (17,045 t was predicted in 2016 vs. 5,698 t extrapolated from partial catches in 2017). Possible reasons for lower catches are discussed below. Recommended ABC's for 2018 and 2019 are 65,929 t and 64,494 t, respectively, and the OFL's are 76,750 t and 67,553 t, based on the projection model results. The new ABC and OFL recommendations for 2018 are similar to those developed using the 2016 full assessment model for 2017 (65,371 t and 76,100 t). The stock is not overfished, and is not approaching a condition of being overfished. Reference values are presented in table 5.

Table 5. Summary results of BSAI arrowtooth flounder flounder (Atheresthes stomias). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf

Quantity	As estimated or *specified last* year for: 2017	2018	*As estimated or *recommended this* year for: 2018	2019
M (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 1+) biomass (t)	779,195	772,153	785,141	782,840
Projected Female spawning	485,802	464,066	490,663	472,562
$B_{100\%}$	530,135	530,135	530,135	530,135
$B_{40\%}$	212,054	212,054	212,054	212,054
$B_{35\%}$	185,547	185,547	185,547	185,547
F_{OFL}	0.151	0.151	0.151	0.151
$maxF_{ABC}$	0.129	0.129	0.129	0.129
F_{ABC}	0.129	0.129	0.129	0.129
OFL (t)	76,100	67,023	76,757	75,084
maxABC (t)	65,371	58,633	65,932	64,494
ABC (t)	65,371	58,633	65,932	64,494
Status	As determined *last* year for: 2015	2016	As determined *this* year for: 2016	2017
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Projections are based on estimated catches of 5,698 t for 2017 and 11,797 t for 2018.
**Natural mortality rate was fixed at 0.35 for males, 0.2 for females.

GOA arrowtooth flounder Arrowtooth flounder biomass estimates in the current model have changed relative to the projection model estimates in 2016 in the Gulf of Alaska. The model projection of spawning biomass for 2018, assuming fishing mortality equal to the recent 5-year average, was 873,789 t, 24% lower than the projected 2018 biomass from the 2016 assessment of 1,154,310 t. The 2018 ABC (estimated in 2017) using F40% was 170,510 t. The 2018 and 2019 ABCs using F40% were lower, 150,945 t and 145,234 t, The projected estimate of total biomass for 2018 was down by 32% from the 2016 assessment of 2,079,029 t, to 1,421,306 t. The 2018 and 2019 OFLs estimated using the projection model were 180,697 t and 173,872 t. The arrowtooth flounder stock in the Gulf of Alaska is not being subjected to overfishing and is not approaching a condition of being overfished. Reference values are presented in table 6.

Table 6. Summary results of GOA arrowtooth flounder flounder (Atheresthes stomias). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/GOAatf.pdf

Quantity	As estimated or *specified last* year for: 2017	2018	*As estimated or *recommended this* year for: 2018	2019
M (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 1+) biomass (t)	2,103,090	2,079,029	1,421,306	1,384,292
Projected Female spawning	1,174,400	1,154,310	873,789	835,009
$B_{100\%}$	992,272	992,272	924,644	924,644
$B_{40\%}$	396,909	396,909	369,858	369,858
$B_{35\%}$	347,295	347,295	323,625	323,625
F_{OFL}	0.204	0.204	0.238	0.238
$maxF_{ABC}$	0.171	0.171	0.196	0.196
F_{ABC}	0.171	0.171	0.196	0.196
OFL (t)	219,327	196,635	180,697	173,872
maxABC (t)	186,093	170,510	150,945	145,234
ABC (t)	186,093	170,510	150,945	145,234
Status	As determined *this* year for: 2015	2016	2016	2017
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

*Projections are based on estimated catches of 21,080 t for 2016 and 23,720 t for 2017.
**Natural mortality rate is 0.35 for males, 0.2 for males.

BSAI Kamchatka Flounder (*Atheresthes evermanni*) An age-structured assessment has been used to assess Kamchatka flounder in BSAI and it is a full update of the 2016 stock assessment. Structural changes were not made to the model. Model differences were due to changes in the data inputs (see summary below). Model 16.0 is the 2016 assessment model and the results are included for to show how differences in the data inputs changed the assessment results. Model 16.0a is the same as 16.0 and includes updated data through 2018 and new Aleutian Islands and fishery length composition estimates, and 16.0b is the same as 16.0a and includes an updated age-length transition matrix developed from the von Bertalanffy relationship where variance is age-dependent. The results from models 16.0a and 16.0b were similar. Under these models the stock would not be considered overfished as the 2018 SSB is above B35%. Also the stock is not approaching an overfished condition as the stock would be above B35% in 2019 and 2020.Based on model performance in both fit and the retrospective analysis model 16.0a is recommended for management purposes. Reference values are presented in table 7.

Table 7. Summary results of BSAI Kamchatka Flounder (Atheresthes evermanni). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf

	Tier 3 assessment model			
	As estimated last year for		As estimated this year for	
Quantity	2018	2019	2019	2020
M (natural mortality rate)	0.11	0.11	0.11	0.11
Tier	3	3	3	3
Projected total (age 2+) biomass (t)	189,868	199,223	**155,251**	156,450
Projected female spawning biomass				
Projected	63,718	67,390	**54,779**	56,675
$B_{100\%}$	126,954	126,954	**107,673**	107,673
$B_{40\%}$	50,782	50,782	**43,069**	43,069
$B_{35\%}$	44,434	44,434	**37,685**	37,685
F_{OFL}	0.075	0.075	**0.108**	0.108
$maxF_{ABC}$	0.064	0.064	**0.090**	0.090
F_{ABC}	0.064	0.064	**0.090**	0.090
OFL (t)	11,347	12,022	**10,965**	11,260
maxABC (t)	9,737	10,317	**9,260**	9,509
ABC (t)	9,737	10,317	**9,260**	9,509
	As determined *last* year for:		As determined *this* year for:	
Status	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

**Based on model 16.0a.*

BSAI Alaska Plaice (*Pleuronectes quadrituberculatus*) Alaska plaice are assessed on a biennial stock assessment schedule as part of the National Marine Fisheries Service assessment prioritization plan implemented in 2017. A statistical age-structured model is used as the primary assessment tool for the Bering Sea/Aleutian Islands Alaska plaice assessment, a Tier 3 stock. This assessment consists of a population model that uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels. The data sets used in this assessment include total catch biomass, fishery age compositions, trawl survey abundance estimates and trawl survey age compositions. In a partial assessment year, the full assessment model is not rerun but instead a Tier 3 projection model with an assumed future catch is run to estimate the stock level in future years. This incorporates the most current catch information without re-estimating model parameters and biological reference points. The Tier 3projection operates outside the full assessment model by projecting estimates of future female spawning biomass, age 6+ total biomass, ABC and OFL from the full model estimate of 2017 numbers-at-age and weight-at-age. For the 2019 fishery, the recommend harvest is the maximum allowable ABC of 143,100 t from the Tier 3 projection model. This ABC is 14% less than last year's ABC of 155,100 t. Reference values for BSAI Alaska plaice are summarized in the table 8. The stock is not being subject to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

Table 8. Summary results of BSAI Alaska Plaice (Pleuronectes quadrituberculatus). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf

Quantity	As estimated or *specified last* year for: 2018	2019	As estimated or *recommended this* year for: 2019	2020
M (natural mortality rate)	0.13	0.13	**0.13**	0.13
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	417,300	412,000	**400,700**	394,700
Female spawning biomass (t)	191,460	181,730	**186,100**	171,100
$B_{100\%}$	317,360	317,360	**317,360**	317,360
$B_{40\%}$	126,900	126,900	**126,900**	126,900
$B_{35\%}$	111,100	111,100	**111,100**	111,100
F_{OFL}	0.149	0.149	**0.149**	0.149
$maxF_{ABC}$	0.124	0.124	**0.124**	0.124
F_{ABC}	0.124	0.124	**0.124**	0.124
OFL (t)	41,170	38,800	**39,880**	37,860
maxABC (t)	34,590	32,700	**33,600**	31,900
Status	As determined *last* year for: 2016	2017	As determined *this* year for: 2017	2018
Overfishing	no	n/a	No	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

GOA Flathead Sole (*Hippoglossoides elassodon*) Flathead sole is assessed using an age-structured model and Tier 3 determination. Thus, the single species projection model was run using parameter values from the accepted 2017 flathead sole assessment model (Turnock et al. 2017), together with updated catch information for 2017-2018, to predict stock status for flathead sole in 2019 and 2020 and to make ABC recommendations for those years. Projections are conducted using numbers-at-age for flathead sole from age 3-21+ and historical recruitment of age 3 individuals is used to calculate OFL's and ABC's. The ABC for flathead sole is 36,782 t in 2019 and 38,273 t in 2020 and the OFL is 44,865 t in 2019 and 46,666 t in 2020. The new ABC recommendation and OFL for 2019 are similar to those developed in 2017 (36,746 t and 44,822 t; Turnock et al. 2017). The principal reference values are shown in table 9.

Table 9. Summary results of GOA Flathead Sole (Hippoglossoides elassodon). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019*	2020*
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	281,635	283,107	283,285	282,750
Projected Female spawning biomass (t)	85,765	89,118	89,205	92,655
$B_{100\%}$	91,551	91,551	91,551	91,551
$B_{40\%}$	36,620	36,620	36,620	36,620
$B_{35\%}$	32,043	32,043	32,043	32,043
F_{OFL}	0.36	0.36	0.36	0.36
$maxF_{ABC}$	0.28	0.28	0.28	0.28
F_{ABC}	0.28	0.28	0.28	0.28
OFL (t)	43,011	44,822	44,865	46,666
maxABC (t)	35,266	36,746	36,782	38,273
ABC (t)	35,266	36,746	36,782	38,273
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

*Projections are based on estimated catches of 2,063 t used in place of maximum permissible ABC for 2018 and 2,369 t used in place of maximum permissible ABC for 2019 and 2020. The 2018 projected catch was calculated as the current catch as of October 6, 2018 added to the average October 6 – December 31 catches over the 5 previous years. The 2019 and 2020 projected catch was calculated as the average catch over the previous 5 years.

BSAI Flathead Sole (*Hippoglossoides elassodon*) "Flathead sole" as currently managed by the North Pacific Fishery Management Council (NPFMC) in the Bering Sea and Aleutian Islands (BSAI) represents a two-species complex consisting of true flathead sole (*Hippoglossoides elassodon*) and its morphologically-similar congener Bering flounder (*H. robustus*). Based on changes in the directed fishing standards to allow increased retention of flatfish, in June 1994 the Council requested the BSAI Plan Team to assign a separate Acceptable Biological Catch (ABC) and Overfishing Limit (OFL) to "flathead sole" in the BSAI, rather than combining them into the "other flatfish" recommendations as in previous assessments. Subsequent to this request, stock assessments for "flathead sole" have been generated annually to provide updated recommendations for ABC and OFL.Flathead sole are distributed from northern California off Point Reyes northward along the west coast of North America and throughout Alaska (Hart 1973). In the northern part of its range, this species overlaps with its congener, Bering flounder, whose range extends north to the Chukchi Sea and into the western Bering Sea. Bering flounder typically represent less than 3% of the combined biomass of the two species in annual groundfish surveys conducted by the Alaska Fisheries Science Center (AFSC) in the eastern Bering Sea (EBS). The two species are very similar morphologically, but differ in demographic characteristics and spatial distribution. Differences between the two species in the EBS have been described by Walters and Wilderbuer (1997) and Stark (2011). Bering flounder exhibit slower growth and acquire energy more slowly when compared with flathead sole. Individual fish of the same size and sex can be 10 years different in age for the two species, while fish of the same age can differ by almost 10 cm

in size. These differences are most pronounced for intermediate-aged fish (5-25 years old) because asymptotic sizes, by sex, are similar for the two species. Thus, whereas age at 50% maturity is similar for both species (8.7 years for Bering flounder, 9.7 years for flathead sole), size at 50% maturity is

substantially smaller for Bering flounder than for flathead sole (23.8 cm vs. 32.0 cm, respectively; Stark, 2004 and Stark, 2011). Stark (2011) hypothesized that the difference in growth rates between the two species might be linked to temperature, because Bering flounder generally occupy colder water than flathead sole and growth rates are typically positively correlated with temperature. Walters and Wilderbuer (1997) illustrated the possible ramifications of combining demographic information from the two species. Although Bering flounder typically represent less than 3% of the combined survey biomass for the two species, lumping the two species increases the uncertainties associated with estimates of life-history and population parameters. Accurate identification of the two species occurs in the annual EBS trawl survey. The fisheries observer program also provides information on Bering flounder in haul and port sampling for fishery catch composition. Biological, fishery, and survey information for Bering flounder was discussed in Appendix C in Stockhausen et al., 2010. Bering flounder and flathead sole are combined under the heading "*Hippoglossoides* spp." and, where necessary, flathead sole (*H. elassodon*) is used as an indicator species for the complex. Where the fishery is discussed, the term "flathead sole" will generally refer to the two-species complex rather than to the individual species. The key results of the assessment, based on the author's preferred model (Model 18.2c), are compared to the key results of the accepted 2017 update assessment (McGilliard 2017) in table 10.

Table 10. Summary results of BSAI Flathead Sole (Hippoglossoides elassodon). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019*	2020*
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	762,513	777,961	673,718	686,431
Projected Female spawning biomass (t)	214,124	205,156	153,203	155,032
$B_{100\%}$	322,938	322,938	212,060	212,060
$B_{40\%}$	129,175	129,175	84,824	84,824
$B_{35\%}$	113,028	113,028	74,221	74,221
F_{OFL}	0.41	0.41	0.47	0.47
$maxF_{ABC}$	0.34	0.34	0.38	0.38
F_{ABC}	0.34	0.34	0.38	0.38
OFL (t)	79,862	78,036	80,918	83,190
maxABC (t)	66,773	65,227	66,625	68,448
ABC (t)	66,773	65,227	66,625	68,448
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* Projections are based on estimated catches of 11,305 t used in place of maximum permissible ABC for 2018 and 12,936 t used in place of maximum permissible ABC for 2019 and 2020. The final catch for 2018 was estimated by taking the average tons caught between October 6 and December 31 over the previous 5 years (2013-2017) and adding this average amount to the catch-to-date as of October 6, 2018. The 2019 and 2020 catch was estimated as the average of the total catch in each of the last 5 years (2013-2017).

GOA Northern and Southern rock sole (*Lepidopsetta polyxstra* and *bilineata*) The Gulf of Alaska (GOA) northern and southern rock sole assessment has been moved to a 4-year assessment cycle per the stock assessment prioritization schedule. During years when a full assessment is not completed a partial assessment will be done. 2018 marks a partial assessment year. The last full assessment was completed in 2017 and marked the first year of the new assessment schedule (Bryan 2017, available online at https://www.afsc.noaa.gov/REFM/Docs/2017/GOAnsrocksole.pdf). New inputs for 2018 projection model were an updated 2017 catch estimate of 1,059 t. Northern and southern rock sole are not reported separately in the commercial catch data. The 2017 catch estimate for northern and southern rock sole separately represents 50% of the total rock sole catch, which was 2,118 t. The 2018 total rock sole catch estimate was found by summing catch extracted from the AKFIN database on October 31, 2018 (1721 t) and the average of the catch caught between October 31st and the end of year (205 t). Therefore, the total catch estimate for 2018 was 1,923 t and the value used in the projection model was 963 t. The 2019 total rock sole catch estimate was 3,199 t and represented the average of the catch from 2013-2017. The catch value used in the projection model was 1600 t. The recommended maximum allowable ABC for northern rock sole is 17,331 t and for southern rock sole is 21,794 t from the updated projection model. This represents a 3% increase for northern rock sole and a 1% increase for southern rock sole from the 2018 ABCs. The 2019 ABCs are less than 1% larger than the projected 2019 ABC from last year's projection model. The following tables summarize the reference values and the recommended ABC and OFL values (Table 11 and 12). Overfishing is not occurring, the stock are not overfished, and they are not approaching an overfished condition. The northern rock sole exploitation rate has ranged from less than 0.01 to 0.04 between 1993 and 2017 2008. The southern rock sole exploitation rate has ranged between 0.005 and 0.02. Both have a generally declining trend since 2008.

Table 11. Summary results of GOA Northern rock sole (Lepidopsetta polyxstra). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnsrocksole.pdf

Quantity	As estimated or *specified last* year for: 2018	2019	As estimated or *recommended this* year for: 2019	2020
M (natural mortality rate; female, male)	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*	0.2, 0.253*
Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	90,794	93,374	93,791	94,110
Projected Female spawning biomass (t)	44,536	45,519	47,104	45,967
$B_{100\%}$	51,553	51,553	51,387	51,387
$B_{40\%}$	20,621	20,621	20,555	20,555
$B_{35\%}$	18,044	18,044	17,985	17,985
F_{OFL}	0.462	0.462	0.462	0.462
$maxF_{ABC}$	0.382	0.382	0.382	0.382
F_{ABC}	0.382	0.382	0.382	0.382
OFL (t)	19,960	20,477	20,582	20,836
maxABC (t)	16,802	17,243	17,331	17,548
ABC (t)	16,802	17,243	17,331	17,548
Status	As determined *last* year for: 2016	2017	As determined *this* year for: 2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

*Male natural mortality was estimate

Table 12. Summary results of GOA Southern rock sole (Lepidopsetta bilineata). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnsrocksole.pdf

Quantity	As estimated or *specified last* year for: 2018	2019	As estimated or *recommended this* year for: 2019	2020
M (natural mortality rate; female, male)	0.2, 0.262*	0.2, 0.262*	0.2, 0.262*	0.2, 0.262*
Tier				
Projected total (age 0+) biomass (t)	138,620	139,907	140,338	141,681
Projected Female spawning biomass (t)	71,913	69,178	71,433	69,295
$B_{100\%}$	93,583	93,583	93,518	93,518
$B_{40\%}$	37,433	37,433	37,407	37,407
$B_{35\%}$	32,754	32,754	32,731	32,731
F_{OFL}	0.326	0.326	0.326	0.326
$maxF_{ABC}$	0.271	0.271	0.271	0.271
F_{ABC}	0.271	0.271	0.271	0.271
OFL (t)	25,333	25,689	25,779	26,383
maxABC (t)	21,424	21,717	21,794	22,298
ABC (t)	21,424	21,717	21,794	22,298
Status	As determined *last* year for: 2016	2017	As determined *this* year for: 2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

*Male natural mortality was estimated

BSAI Northern rock sole (*Lepidopsetta polyxstra*) The 2018 bottom trawl survey point estimate is a 21% decrease from the 2017 estimate. These two estimates are the lowest in the past 25 years and have the effect of lowering the assessment model time series abundance estimates relative to the last full assessment conducted in 2016. The model results indicate that the stock condition has been at a high and stable level but in a slow decline for the past 9 years. The female spawning biomass is now at a

peak and is starting to decline as a result of the combination of strong recruitment from the 2001-2003 and 2005 year classes, which are presently at the age of maximum cohort biomass, and light fishery exploitation. Model 15.1 is the preferred model evaluated in this assessment. Models 18.1 through 18.3 represent Model runs made to examine alternate states of nature for contrast to the primary models results. Ensemble modeling was also investigated. The principal reference values are shown in table 13. The northern rock sole stock is not overfished or approaching overfishing.

Table 13. Summary results of BSAI Northern rock sole (Lepidopsetta polyxstra). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019	2020
M (natural mortality rate)	0.15	0.15	0.15	0.15
Tier	1a	1a	1a	1a
Projected total (age 6+)	923,200	852,000	828,000	1,001,400
Female spawning biomass (t)	472,200	413,300	417,800	338,300
Projected				
B_0	678,310		515,680	
B_{MSY}	257,000	257,000	186,000	186,000
F_{OFL}	0.16	0.16	0.147	0.147
$maxF_{ABC}$	0.155	0.155	0.144	0.144
F_{ABC}	0.155	0.155	0.144	0.144
OFL (t)	147,300	136,000	122,000	147,500
maxABC (t)	143,100	132,000	118,900	143,700
ABC (t)	143,100	132,000	118,900	143,700
Status	As determined *last* year for:		As determined *this* year	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

BSAI Yellowfin Sole (*Pleuronectes asper*, also known as *Limanda aspera*) The assessment updates last year's with results and management quantities that are lower than the 2017assessment primarily due to 1) the 2018 survey biomass point estimate is 32% lower than the 2017 estimate and 2) the assessment model estimated a slightly lower survey catchability. Yellowfin sole continue to be well-above BMSY and the annual harvest remains below the ABC level. The female spawning stock is in a slow downward trend. Management quantities are given below for the current base model (Model 14_1; Table 14) and a new base model (Model 18_1; Table 15). According to both models the BSAI Yellowfin sole stock is not overfished or approaching overfishing.

Table 14. Summary results of current base model (Model 14_1) for BSAI Yellowfin Sole (Limanda aspera). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019	2020
M (natural mortality rate)	0.12	0.12	0.12	0.12
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	2,553,100	2,460,700	2,388,000	2,331,500
Female spawning biomass (t)				
Projected	895,600	890,000	827,900	796,600
B_0	1,204,000		1,236,000	
B_{MSY}	456,000		451,600	
F_{OFL}	0.12	0.12	0.118	0.118
$maxF_{ABC}$	0.109	0.109	0.107	0.107
F_{ABC}	0.109	0.109	0.107	0.107
OFL (t)	306,700	295,600	281,800	275,100
maxABC (t)	277,500	267,500	255,100	249,100
ABC (t)	277,500	267,500	255,100	249,100
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Table 15. Summary results of New proposed base model (Model 18_1) for BSAI Yellowfin Sole (Limanda aspera). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019	2020
M (natural mortality rate)	0.12	0.12	0.12	0.12
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	2,553,100	2,460,700	2,462,400	2,411,700
Female spawning biomass (t)				
Projected	895,600	890,000	850,600	821,500
B_0	1,204,000		1,245,400	
B_{MSY}	456,000		460,800	
F_{OFL}	0.12	0.12	0.118	0.118
$maxF_{ABC}$	0.109	0.109	0.107	0.107
F_{ABC}	0.109	0.109	0.107	0.107
OFL (t)	306,700	295,600	290,000	284,000
maxABC (t)	277,500	267,500	263,200	257,800
ABC (t)	277,500	267,500	263,200	257,800
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

BSAI Southern rock sole (*Lepidopsetta bilineata*) Two species of rock sole are known to occur in the North Pacific Ocean, a northern rock sole (*L. polyxystra*) and a southern rock sole (*L. bilineata*) (Orr and Matarese 2000). These species have an overlapping distribution in the Gulf of Alaska, but the northern species comprise the majority of the Bering Sea and Aleutian Islands populations where they are managed as a single stock. Biomass estimates from the Bering Sea shelf surveys and Aleutian Islands surveys show an increasing trend since 2010 (Table 16).

Table 16. Southern rock sole biomass estimates (t) and CV from the Bering Sea shelf surveys and Aleutian Islands surveys.
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

	shelf survey		Aleutian Islands	
	biomass (t)	CV	biomass (t)	CV
1997	65	1	6257	0.23
1998	701	0.87		
1999	126	0.89		
2000	3	1	5560	0.35
2001	86	1		
2002	23	1	6684	0.21
2003	166	0.71		
2004	152	0.82	11962	0.11
2005	428	0.75		
2006	942	0.71	7026	0.25
2007	3401	0.7		
2008	1322	0.81		
2009	2465	0.99		
2010	209	1	7593	0.52
2011	800	0.63		
2012	746	0.91	8661	0.35
2013	613	0.71		
2014	730	1	10709	0.45
2015	2450	0.96		
2016	1174	0.93	7760	0.23
2017	10287	0.94		
2018	2795	1.0	10652	0.12

GOA Rex sole (*Glyptocephalus zachirus*) Rex sole is assessed using an age-structured model and Tier 3 determination within the context of a two-area model. The Western-Central GOA and Eastern GOA are modeled as separate areas with distinct growth patterns estimated by area. Thus, the single species projection model was run separately for the two areas using parameter values from the accepted 2017 rex sole assessment model (McGilliard and Palsson 2017), together with updated catch information for 2017-2018, to predict stock status for rex sole in 2019 and 2020 and to make ABC recommendations for those years. Projections are conducted using numbers-at-age for rex sole from age 3-20+ by area and historical recruitment of age 3 individuals by area to calculate OFL's and ABC's. Based on the updated projection model results, the recommended ABC's for 2019 and 2020 in the Western-Central GOA are 11,308 t and 11,327 t, and the OFL's are 13,755 t and 13,788 t. The new ABC recommendation and OFL for the Western-Central GOA in 2019 are similar to those developed in 2018 (11,145 t and 13,558 t). The recommended ABC's for 2019 and 2020 in the Eastern GOA are 3,384 t and 3,398 t, and the OFL's are 4,134 t and 4,154 t. The new ABC recommendation and OFL for the Eastern GOA in 2019 are exactly the same as those developed in 2018 because realized and projected catches as estimated last year and this year were less than 2 t. The principal reference values are shown in tables 17-19. The first table shows quantities for the entire GOA, the second table shows quantities for the Western-Central GOA, and the third table shows quantities for the Eastern GOA. The Western-Central and Eastern GOA are based on a Tier 3a approach, and the entire GOA table is simply the sum of the two areas.

Table 17. Summary results of GOA Rex sole (Glyptocephalus zachirus) in the entire Gulf of Alaska. https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf

Quantity	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019*	2020*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	97,982	97,967	98,818	99,383
Female spawning biomass (t)	45,750	43,575	44,072	43,392
$B_{100\%}$	See area-specific tables below		See area-specific tables below	
$B_{40\%}$				
$B_{35\%}$				
F_{OFL}				
$maxF_{ABC}$				
F_{ABC}				
OFL (t)	18,706	17,692	17,889	17,942
maxABC (t)	15,373	14,529	14,692	14,725
ABC (t)	15,373	14,529	14,692	14,725
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

Table 18. Summary results of GOA Rex sole (*Glyptocephalus zachirus*) in the Western-Central Gulf of Alaska. https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf

Quantity: (Western-Central GOA)	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019*	2020*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	76,644	76,631	77,483	77,939
Female spawning biomass (t)	36,374	34,569	35,066	34,484
$B_{100\%}$	48,138	48,138	48,138	48,138
$B_{40\%}$	19,255	19,255	19,255	19,255
$B_{35\%}$	16,848	16,848	16,848	16,848
F_{OFL}	0.29	0.29	0.29	0.29
$maxF_{ABC}$	0.23	0.23	0.23	0.23
F_{ABC}	0.23	0.23	0.23	0.23
OFL (t)	14,375	13,558	13,755	13,788
maxABC (t)	11,825	11,145	11,308	11,327
ABC (t)	11,825	11,145	11,308	11,327
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* Projections are based on the final catch of 2017 from the Western and Central GOA of 1,483 t and estimated catches of 1,673 t and 2,494 t that were used in place of maximum permissible ABC for 2018 and 2019, respectively. The 2018 projected catch was calculated as the current catch of GOA rex sole in the Western and Central GOA as of October 6, 2018 added to the average October 6 – December 31 GOA rex sole catches over the 5 previous years. The 2019-2020 projected catch was calculated as the average catch over the previous five years.

Table 19. Summary results of GOA Rex sole (Glyptocephalus zachirus) in the Eastern Gulf of Alaska. https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf

Quantity: (Eastern GOA)	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2018	2019	2019*	2020*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	21,338	21336	21,335	21,444
Female spawning biomass (t)	9,376	9,006	9,006	8,908
$B_{100\%}$	9,597	9,597	9,597	9,597
$B_{40\%}$	3,839	3,839	3,839	3,839
$B_{35\%}$	3,359	3,359	3,359	3,359
F_{OFL}	0.31	0.31	0.31	0.31
$maxF_{ABC}$	0.25	0.25	0.25	0.25
F_{ABC}	0.25	0.25	0.25	0.25
OFL (t)	4,331	4,134	4,134	4,154
maxABC (t)	3,548	3,384	3,384	3,398
ABC (t)	3,548	3,384	3,384	3,398
Status	As determined *last* year for:		As determined *this* year for:	
	2016	2017	2017	2018
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* Projections are based on the final catch of 2017 from the Eastern GOA of 1.8 t and estimated catches of 1.8 t and 1.2 t that were used in place of maximum permissible ABC for 2018 and 2019, respectively. The 2018 projected catch was calculated as the current catch of GOA rex sole in the Eastern GOA as of October 6, 2018. The 2019-202 projected catch was calculated as the average catch over the previous five years. In many years catches from the Eastern GOA are small and confidential.

BSAI Greenland turbot (*Reinhardtius hippoglossoides*) New data for the assessment of the stock included 2018 NMFS shelf bottom trawl survey and ABL longline survey estimates and size compositions. Age composition and size at age data from the 2017 NMFS shelf bottom trawl survey also became available and were used in this assessment. Fishery catch estimates were updated including projected values for 2018. Data on fishery size composition for 2018 were included. The base model has the same configuration as the 2016 assessment model (model 16.4 in Barbeaux et al. 2016, model 16.1), but the ABL longline survey catchability parameter was estimated. During the 2016 assessment cycle and again during the September Plan Team meeting in 2018, it was noted that good recruitment appeared to occur in years where the bottom temperatures were well below the mean. Therefore, a model linking an environmental index to recruitment through R0 was explored and evaluated for the November Plan Team meeting. This was model 16.6 in Barbeaux et al. 2016 and will be referred to as 16.1c throughout this report. An index of bottom temperatures where 0s indicated warm years and -1s indicated cold years. Cold years were defined as those with temperatures below 1 standard deviation from the 1982-2016 mean as calculated in Spencer (2006).Years prior to 1982 were set to -1 when the annual average PDO was negative, as bottom temperatures were not available. We fit a parameter that in effect changed R0 for years that were deemed "cold" from those that were not. The principal reference values are shown in table 20. The stock is not overfished or approaching overfishing.

Table 20. Summary results of BSAI Greenland turbot (Reinhardtius hippoglossoides). Source: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf

Quantity	As estimated or *specified last* year for: 2018	2019	As estimated or *recommended this* year* for: 2019	2020
M (natural mortality rate)	0.112	0.112	0.112	0.112
Tier	3a	3a	3a	3a
Projected total (age 1+)	126,417	127,021	105,930	98,876
Female spawning biomass	58,035	61,878	54,244	52,743
Projected				
$B_{100\%}$	103,097	103,097	90,534	90,534
$B_{40\%}$	41,239	41,239	36,213	36,213
$B_{35\%}$	36,084	36,084	31,687	31,687
F_{OFL}	0.22	0.22	0.21	0.21
$maxF_{ABC}$	0.18	0.18	0.18	0.18
F_{ABC}	0.18	0.18	0.18	0.18
OFL (t)	13,148	13,540	11,362	10,476
maxABC (t)	11,132	11,473	9,658	8,908
ABC (t)	11,132	11,473	9,658	8,908
Status	As determined *last* year for: 2016	2017	As determined *this* year for: 2017	2018
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

** Projections are based on model 16.1b and estimated catches of 3,758 t used in place of maximum permissible ABC for 2018. The final catch for 2018 was estimated as the product of the average proportion of the TAC captured over the previous 5 years (2013-2017) and the 2018 TAC.*

3.4 International fishery stock assessment guidance (where applicable)

Not applicable

3.5 Published stock assessments conducted by third party organizations (where available)

Not applicable

3.6 Management practices of the competent management authority

3.6.1 Principal Management Organisations

The National Marine Fisheries Service (NMFS)
NMFS (also known as NOAA fisheries) is responsible for the management, conservation, and protection of living marine resources within the US Exclusive Economic Zone (EEZ). The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nautical miles – nm), with responsibilities covering 842,000 nm^2 off Alaska. In addition to stock survey, stock assessment reports and biological studies related to the Pacific cod fisheries, NMFS is charged with carrying out the federal mandates of the U.S. Department of Commerce with regard to commercial fisheries such as approving and implementing Fisheries Management Plans (FMPs) and FMP amendments recommended by the North Pacific Fisheries Management Council (NPFMC). The NMFS's Office for Law Enforcement (OLE) partners the U.S. Coast Guard in the monitoring, control and enforcement of fisheries regulations.

The North Pacific Fishery Management Council (NPFMC)
The NPFMC is one of eight regional councils established by the Magnuson Fishery Conservation and Management Act as amended 2007 [also referred to as the Magnuson-Stevens Act (MSA)] to oversee management of the nation's fisheries. The NPFMC recommends regulations to govern the groundfish stocks, including flatfish, in the Alaska's EEZ. NPFMC management measures for Alaska flatfish include seasonal and spatial allocation of Total Allowable Catch (TAC), time and area restrictions (e.g. protected/conservation areas), full retention requirements (GOA) Prohibited Species Catch (PSC) Limits, reporting and observer requirements. The NPFMC is supported by the Advisory Panel (AP), the members of which represent major segments of the fishing industry; catching and processing, subsistence and commercial fishermen, observers, consumers, environmental / conservation, and sport fishermen. The Scientific and Statistical Committee (SSC) also supports the Council with advice on scientific and other technical matters. The Committee is composed of scientists in biology, economics, statistics, and social science.

Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)
ADFG is the state department responsible for managing fish resources within state waters (0 – 3 nm). The basis of natural resource management, including fish and fisheries is enshrined in the state constitution. The Department's Board of Fisheries (BOF) is established under Alaska Statute for the purposes of the conservation and development of the fisheries resources of the state. The seven-person Board is appointed by the state governor and confirmed by the legislature. The Board's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The Department is responsible for management of the fisheries based on the BOF decisions. Enforcement of state waters regulations is provided by the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT).

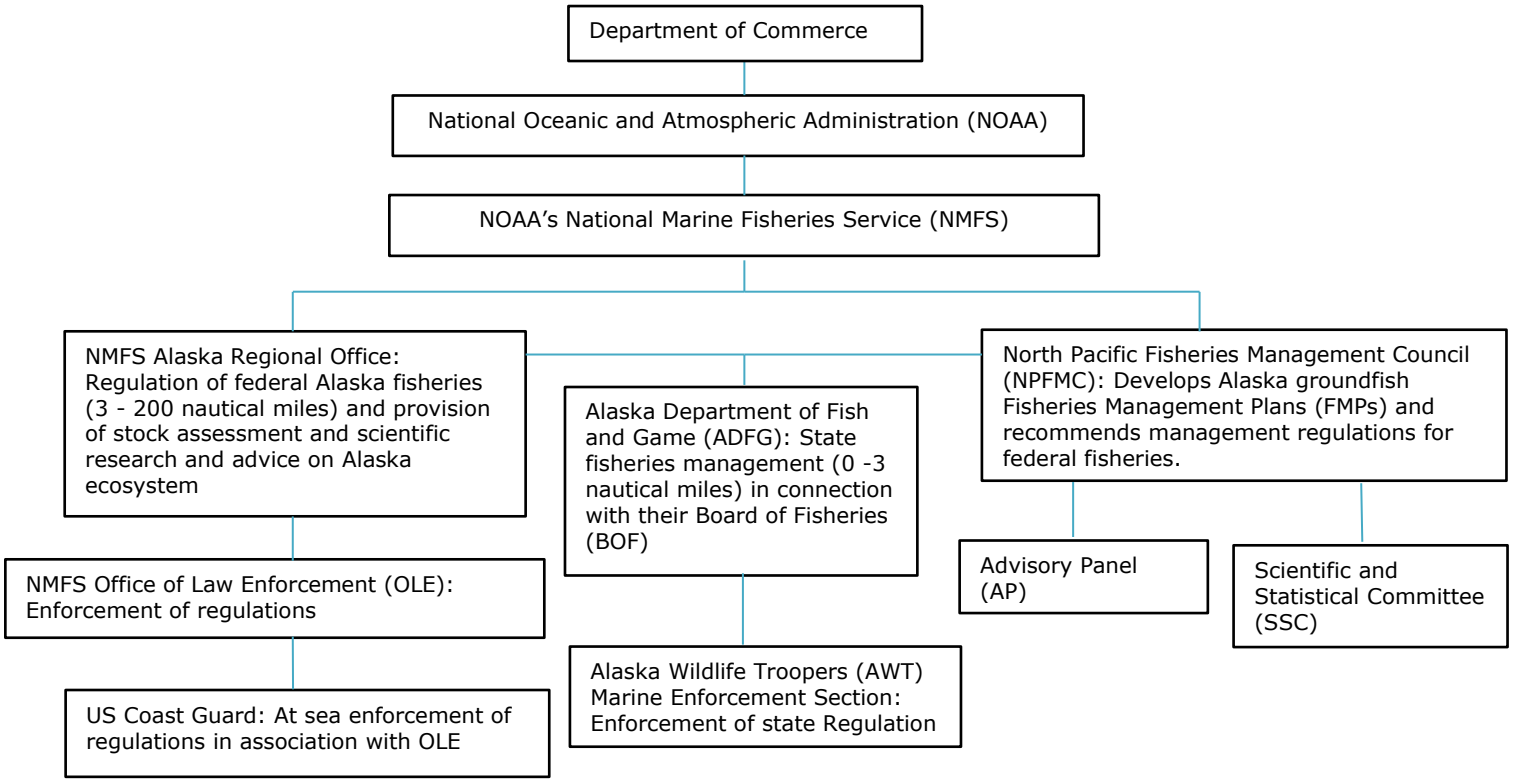


Figure 13. The organisational structure for the management of the Alaska groundfish fisheries (adapted from: Global Trust, 2011)

3.6.2 Established legislation

Federal
The principal legislative instrument for fisheries management in the US is the MSA. The MSA contains ten National Standards (NSs) which fishery managers must consider when preparing a Fishery Management Plan (FMP) or Amendment. These NSs are:

1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the U.S. fishing industry;
2. Conservation and management measures shall be based upon the best scientific information available;
3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination;
4. Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonable calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of privileges;
5. Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose;
6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches;
7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication;
8. Conservation and management measures shall, consistent with the conservation requirements of the Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse

economic impacts on such communities;
9. Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch; and,
10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

NMFS implements the MSA and the NSs. The procedures on how NMFS follows the NSs are published in the US Federal Register at 50 CFR Part 600 subpart D.

The MSA also establishes the NPFMC as one of eight regional councils to manage fisheries in the US EEZ.

State
State waters are fished under State of Alaska commercial fisheries regulations. The General Commercial Fisheries Regulations establishes the basic regulations, i.e. those that give the ADFG and BOF the powers to regulate and manage the state fishery resource and describe the extent of their regulatory powers. The Commercial Groundfish Fisheries Regulations, defines the statewide groundfish provisions. State-wide regulations 5 AAC 28.086 and 5 AAC 28.087 give the ADFG authority to manage parallel fisheries (those Council groundfish fisheries within state waters) and parallel fisheries with Stellar Sea Lion (SSL) restrictions, respectively, incorporating federal/Council regulations within state waters.

3.6.3 Governance procedure

The North Pacific Fisheries Management Council (NPFMC)
The NPFMC primarily manages groundfish in the BSAI and GoA, targeting pollock, Pacific cod, flatfish, mackerel, sablefish, and rockfish harvested by trawl, longline, jig, and pot gear. The NPFMC conducts public hearings so as to allow all interested persons an opportunity to be heard in the development of FMPs and amendments, and reviews and revises, as appropriate, the assessments and specifications with respect to the optimum yield from each fishery (16 U.S.C. 1852(h)). The NPFMC has developed a management policy and objectives to guide its development of management recommendations to the Secretary of Commerce. Other large Alaska fisheries for salmon, crab, and scallops are managed jointly with the State of Alaska. The NPFMC also works very closely with the ADFG and the BOF to coordinate management programs in federal and state waters. Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the NPFMC and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other.

The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process and the Council Operating Procedures. The following section draws upon these processes and procedures.

The North Pacific fisheries comprise numerous species managed under five FMPs, two of which include pollock: BSAI Groundfish FMP and GoA Groundfish FMP. The others are: BSAI King and Tanner Crab FMP; Alaska Scallop FMP; and, Alaska Salmon FMP.

The NPFMC has eleven voting members and four non-voting members. NPFMC members must balance competing interests while trying to make decisions for the overall benefit of the nation. NPFMC members are advised by the NPFMC advisory panels and committees, NPFMC staff, the public, states, academia, and NMFS. The states of Alaska, Washington, and Oregon are represented on the Council.

The eleven voting members include:
- The director of the Alaska Department of Fish and Game or a designee;
- The director of the Washington Department of Fish and Wildlife or a designee;
- The director of the Oregon Department of Fish and Wildlife or a designee;
- The Regional Administrator of the National Marine Fisheries Alaska Regional Office or a designee; and,
- Seven private citizens who are familiar with the fishing industry, marine conservation, or both. These citizens (5 members from Alaska and 2 from Washington) are appointed by the Secretary of Commerce from lists submitted by the Governors of Alaska and Washington.

There are also four non-voting members who assist the NPFMC in decision-making. They represent:

- The Pacific States Marine Fisheries Commission (data and research);
- The U.S. Fish and Wildlife Service (seabirds, ecosystems, otters and walrus);
- The U.S. Department of State (decisions that have international implications); and,
- The U.S. Coast Guard (enforcement and safety issues).

The NPFMC is supported by two formal advisory groups: The Scientific and Statistical Committee (SSC) and the Advisory Panel (AP). The SSC is composed of experts in biology, statistics, economics, sociology, and other relevant disciplines from the federal, state, and private scientific communities and other appropriate sources. Independent experts on the SSC cannot be employed by an interest group or advocacy group. The AP are recognized experts from the fishing industry and represent a variety of gear types, industry and related interests as well as a spread of geographic regions of Alaska and the Pacific Northwest. The NPFMC relies on the AP for advice on how various fishery management alternatives will affect the industry and local economies; on potential conflicts between user groups of a given fishery resource or area; and, on the extent to which the US will utilize resources managed by the NPFMC's FMPs. The AP consists of approximately 20 members, however, the NPFMC will not necessarily keep all seats filled.

The NPFMC appoints "Plan Teams" for each of the major FMPs. Members of each team are selected from those agencies and organizations having a role in the research and/or management of fisheries. The Plan Teams review stock assessment information and assist in the preparation of the annual Stock Assessment and Fishery Evaluation (SAFE) documents including formulation of recommendations on annual Acceptable Biological Catch (ABC) levels for groundfish, crab, and scallop species under the jurisdiction of the Council. The Plan Teams may also prepare and/or amend supporting analytical documents for the Council, SSC and AP; aggregate and evaluate public/industry proposals and comments; summarize and evaluate data related to the biological, economic and social conditions of the fishery; conduct and evaluate analyses pertaining to management of the fisheries; evaluate the effectiveness of management measures in achieving the plan's objectives; and recommend when and how management measures need to be changed.

The NPFMC may appoint standing and ad-hoc committees from among the voting and non-voting members and knowledgeable members of the public, as it deems necessary for the conduct of Council business. The NPFMC Chair may also appoint standing or ad-hoc Committees that include industry representatives or other participants to address specific management issues or programs.

Under the MSA, each Council must reflect the expertise and interests of its constituent States, with membership that is knowledgeable about conservation, management, commercial or recreational harvest, of the fishery resources within the council area. The Secretary of Commerce is charged with ensuring each council has membership that fairly represents the commercial and recreational fisheries under that Council's jurisdiction. Each year the Secretary submits a report on Council membership to the Senate Committee on Commerce, Science, and Transportation that list the fisheries under the jurisdiction of each Council and their characteristics, assesses Council membership in terms of the apportionment of the active participants in each Council's fisheries, and states a plan and schedule for actions to achieve a fair and balanced apportionment on each council.

The NPFMC normally meets five times each year. Each meeting normally lasts from six to seven days and begins on Wednesday of the meeting week. The NPFMC's SSC and AP generally meet concurrently with the NPFMC, starting two days prior to the NPFMC. All meetings are open to the public, except for a short, closed Council session in which the NPFMC deals with personnel, administrative, or litigation issues. Meeting locations rotate among member state cities. Advisory bodies also meet at various times between Council meetings.

Management measures developed by the NPFMC are recommended to the Secretary of Commerce through the NMFS. Management measures are implemented by NMFS Alaska Regional Office and enforced by the OLE and USCG.

The Council participates in international negotiations concerning any fishery matters under the purview of the Council. The Council also consults during preliminary discussions leading to US positions on international fishery matters, including the allocation of fishery resources to other nations within its area of authority.

Each regular Council meeting and, any emergency meeting, is open to the public. Interested persons

may present oral or written statements regarding the matters on the agenda at meetings, within reasonable limits established by the Chair. Current Council policy on oral testimony limits individuals to three minutes, and organizations to six minutes, per agenda item. All written information submitted to the Council by an interested person shall include a statement of the source and date of such information. Any oral or written statement shall include a brief description of the background and interests of the person in the subject of the oral or written statement (NPFMC 2009).

Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. For those proposals, the Council chooses to pursue, it directs NMFS and/or Council staff to prepare an analysis considering a range of alternatives. The Council reviews the analysis and selects a range of alternatives within which a preliminary preferred alternative may be identified. The analysis is then made available for public review, and the Council makes a final decision at the next meeting. After considering Council recommendations and public comments, NMFS publishes the adopted regulations. For non-routine and annual management decisions, NMFS publishes a Federal Register notice and provides a public comment period before finalizing the recommendations (NPFMC 2009).

The Council may hold public hearings in order to provide the opportunity for all interested individuals to be heard with respect to the development of fishery management plans or amendments, and with respect to the administration and implementation of other relevant features of the Act. Notice of each hearing must be received by NMFS for publication in the Federal Register at least 23 calendar days prior to the proposed hearing. The Council will also issue notices to announce the time, location, and agenda for each hearing in a manner sufficient to assure all interested parties are aware of the opportunity to make their views known. If it is determined a hearing is appropriate, the Council Chair will designate at least one voting member of the Council to officiate. An accurate record of the participants and their views will be made available to the Council at the appropriate Council meeting and maintained as part of the Council's administrative record.

The procedure for changing Federal fishing regulations follows a standardized process, set by a combination of laws, regulations, operational guidelines, policies, as well as adjustments and adaptations developed by the Council intended to increase efficiency, provide public participation, and produce quality outcomes (NPFMC 2009; 2014). All documents are posted on the website in advance of the meeting, and public comment is taken by the Council and advisory bodies before any decisions are made.

Concerns and proposals for change are brought to the Council's attention by the public through the industry advisory panel or other committee, or directly to the Council via written or verbal public comment during the 'Staff Tasking' agenda item at each Council meeting. Figure 14 describes the process for regulatory change.

A discussion paper is frequently prepared by staff as a first step to flesh out the scope of the problem identified and discuss issues that may be of concern in the development of alternatives. For very complex issues, several discussion papers may be necessary to explore the full scope of an issue before reasonable alternatives can be developed. For relatively simple changes, where the problem and alternatives are self-evident, a discussion paper may not be necessary, and the issue can go straight to analysis, even without developing an official problem statement and range of alternatives. The AP (and other committees if appropriate) provides recommendations to the Council at this stage as to whether the issue should proceed further in the process, if an expanded discussion paper is needed, or if the issue is ready for analysis (and recommends alternatives to be evaluated).

The Council usually adopts a problem statement (or thoroughly describes the problem) and identifies alternatives to be considered, and then staff prepare a draft analysis that integrates analytical requirements of applicable laws and executive orders. The analysis is released for review about 2 weeks before the meeting. The analysis is reviewed by the SSC for scientific merit, and by the AP to make recommendations regarding any missing information and the suite of alternatives and options evaluated. If the SSC has deemed the analysis inadequate and not ready for public review, or if the Council determines that additional alternatives or other substantial changes to the analysis are required, another initial review may be scheduled before the issue is scheduled for final action. If the analysis is to be released, the Council may designate a preliminary preferred alternative to focus comments on their indicated course of action.

After initial review, staff revise the analysis based on SSC, AP, and Council comments, and the analysis

is posted on the Council website about 3 to 4 weeks before the next meeting. The AP makes a recommendation to the Council regarding a preferred alternative. The Council makes a final decision by roll call vote on the motion.

The NMFS region prepares draft regulations based on Council action, and once cleared by the region and OMB, a proposed rule is published in the Federal Register. The public is provided time to comment on the proposed rule. Final Rule. NMFS region staff summarizes comments, and may make adjustments to the rule based on these comments. The response to comments, the revised final rule, and final approval decision is published in the Federal Register.

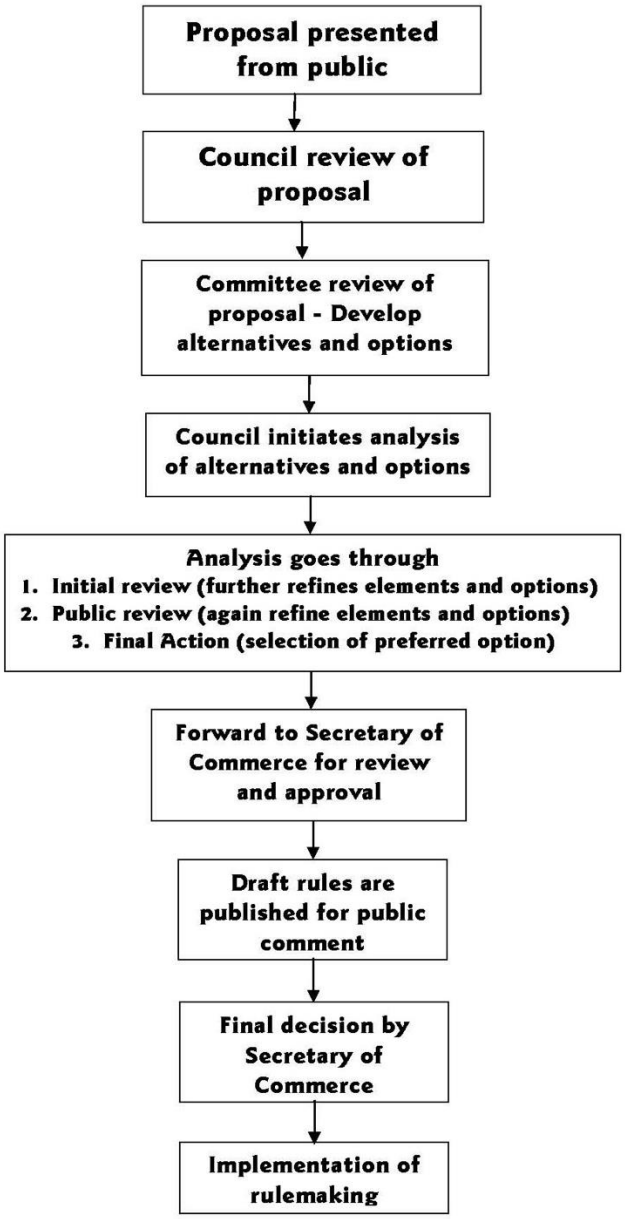


Figure 14. A flow-diagram showing the process for regulatory change at the NPFMC

Alaska Board of Fisheries (BOF)
The BOF consists of seven members serving three-year terms. Members are appointed by the Governor and confirmed by the Legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership.

The BOF's main role is to conserve and develop the fishery resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The Board is charged with making allocative decisions, and the ADFG is responsible for management based on those decisions.

The BOF meets four to six times per year in communities around the state to consider proposed changes to fisheries regulations around the state. The board uses the biological and socioeconomic information provided by then ADFG, public comment received from people inside and outside of the state, and guidance from the Alaska Department of Public Safety and Alaska Department of Law when creating regulations that are sound and enforceable.

The BOF has the authority to adopt regulations described in AS 16.05.251 including: establishing open and closed seasons and areas for taking fish; setting quotas, bag limits, harvest levels and limitations for taking fish; and establishing the methods and means for the taking of fish. The regulations the BOF has authority over are 5 AAC Chapters 1- 77.

The BOF conducts regular reviews of groundfish fisheries within state waters of Alaska. The Board's review of FMPs, amendments and other regulatory changes include input from ADFG staff, Regional ADFG advisory committees, non-ADFG scientists, industry, environmental non-governmental organisations (ENGOs), stakeholders and the general public.

ADFG staff participates in the NPFMC Plan Team process soliciting peer reviews of stock assessments, and its meetings consider outside views regarding its analyses. As a participant in the Plan Team process, a panel of biologists, from various state and federal agencies and recognized as having expertise in the field of groundfish population dynamics are consulted on an annual basis to review the most recent groundfish survey information from the NMFS. If new data points for biomass estimates suggest a higher or lower ABC, then the outside experts have equal input with assessment authors relative to adjusting these parameters.

Legislative committees have conducted oversight and legislative hearings regarding the BOF's actions in a region's fisheries. The BOF and ADFG frequently turn to outside sources for technical advice, particularly regarding scientific matters and monitoring issues. If there are socio-economic or other ecosystem concerns expressed, the BOF can adjust time or area openings commensurate with the adjusted ABC. When the Plan Team recommends these adjusted ABCs to the NPFMC, and the BOF makes regulatory adjustments based on the adjusted ABCs, the process again gets external review and discussion from commercial fishing groups, sport fishing groups, tourism representatives, etc. This process of external review is repeated in the BOF meeting schedule every 3 years.

3.6.4 Reporting activities

The NPFMC and BOF management arrangements and decision-making processes are organised in a very transparent manner. The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites including agenda of meetings, discussion papers, newsletter, minutes and records of decisions. The Council and the BOF actively encourage stakeholder participation, and all Council and BOF deliberations are conducted in open, public sessions. Furthermore, considerable information on the fisheries, Working Groups/Committees, research, habitat protection, protected species, current issues, catch share, bycatch controls, regulations and more are available on the websites.

3.6.5 Surveillance and enforcement activities

Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE and the USCG (17th District USCG). The USCG also undertake inspections of fishing vessels and enforce mandatory safety of life and property at sea requirements for the fishing fleets. The AWT fulfills the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

OLE protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679]) and international agreements, e.g. combating Illegal,

Unreported, Unregulated (IUU) fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia.

The OLE in Alaska focuses on outreach and education programs to help the fishing industry understand the rationale for regulations and prevent or minimize infractions. The OLE enforcement staffing levels increased in 2017; sixteen special agents and enforcement officers now operate in the Alaska region. The NMFS Alaska Region OLE reports few major compliance issues.

The OLE publishes a national annual report and the Alaska region submits six monthly reports to the NPFMC (as an example see OLE 2018 - Report for the period 1st October 2017 – 31st March 2018: for all fisheries, there were: 91 written warnings, 218 summary settlements and 1 criminal case. The report does not distinguish which fishery the offences related to.

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's Office of General Counsel (OGC) for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment. The MSA has an enforcement policy section (50 CFR 600.740) that details these "remedies for violations".

The USCG is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District[6] covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of responsibility within the USCG.

If the USCG detects a fisheries infringement they gather evidence and hand over the investigation to the OLE. The USCG makes an annual report to the NPFMC on resources applied to fishery enforcement in the previous year, the number of boardings/inspections, the number of violations, lives lost at sea, safety issues, and any changes in regulations. The most recent report April – May 2017, indicates a low number of infractions: from a total of 93 boardings, all but one were related to safety equipment deficiencies.

The main enforcement issue for the flatfish fishery is related to halibut bycatch, however, voluntary compliance, i.e. recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue. The USCG use a software package (FishTactic) to assess risk of infringements and is used to assist the deployment of vessels and aircraft and target enforcement effort.

The NPFMC Groundfish and Halibut Observer Program (The Observer Program) is an important component of the monitoring of the Alaska groundfish fisheries. It is industry-funded and provides a monitoring and data collection function that uses onboard observers and electronic monitoring (EM). On August 8, 2017 NMFS published a final rule to integrate EM into the North Pacific Observer Program (Ganz et al. 2018).

The program is the main data gathering program for all biological and fishery data that feed into flatfish stock assessments and management. While observers are not directly part of the federal MCS program they are required to report infringements. OLE and USCG officers conduct de-briefing interviews with observers, checking on vessels fishing practices and the conduct of the crew. Observers will often report potential infringements to the vessel captains, thereby contributing to self-regulation and corrective action.

The Observer Program places all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two observer coverage categories: 1) full observer coverage, or, 2) partial observer coverage. Vessels and processors in the full coverage category have at least one observer present during all fishing or processing activity. Vessels and processors in the partial coverage category are assigned observer or EM based on the sampling plan described in the Annual Deployment Plan (ADP). The selection rates as described in the 2018 ADP and programmed into the Observer Declare and Deploy System (ODDS).

[6] http://www.pacificarea.uscg.mil/Our-Organization/District-17/

Observer coverage in the BSAI groundfish fisheries by catcher/processors, and catcher vessels delivering to motherships is 100%.

EM deployment in 2019 continues to be funded through a combination of federal funding and other sources such as from the National Fish and wildlife Foundation. NMFS placed 168 vessels in the EM selection pool (AFSC 2019).

The primary responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska state waters lies with the Alaska Department of Public Safety, through its Division of Alaska Wildlife Troopers[7] (AWT) (the division also enforces non-fisheries related regulations passed by the Board of Game). Biologists and other staff of the ADFG sometimes participate in enforcement activities and assist the Wildlife Troopers as needed. Some ADFG field staff have enforcement training and have powers of arrest. The AWT attend the BOF and have an important input in the development of state regulations and legislation.

For fisheries in state waters, landings, buying and production data for groundfish are recorded on ADFG fish tickets or through the eLandings system (internet-based electronic filing), and the Commercial Operators Annual report, as required by Alaska Statute (Section 16.05.690 Record of Purchases[8]) and the Alaska Administrative Code (5 AAC 39.130[9] Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements).

The NPFMC have an established Enforcement Committee[10] charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea. The Committee is made up of governmental agencies (including OLE, USCG, ADFG, AWT) and organizations having expertise relating to the enforcement and monitoring of North Pacific groundfish and crab fisheries. Meetings are held on a regular basis, typically in conjunction with regular Council meetings and, are open to the public.

Halibut PSC Reduction

Since the implementation of Amendment 80, the Alaska groundfish sector and the NPFMC have been working toward reducing the catch of halibut by the sector. The Alaska Groundfish Cooperative entered into a "Halibut Agreement" in 2016 to ensure a sector-wide accountability for halibut avoidance. The agreement consists of three components:

- Best Practices – The plan defines best operational practices for halibut avoidance for the Amendment 80 sector, including: monitoring halibut bycatch; communication protocols; excluder use and development; and halibut avoidance through changing a variety of fishing parameters, including location, target, depth, tow speed, and other factors.
- Halibut Avoidance Plan – The plan defines performance standards to incentivise all vessels in the fleet (through financial penalty) to achieve acceptable levels of halibut use in the fisheries. The program is intended to ensure that all vessels maintain minimum halibut rates annually using both annual and quarterly performance standards with a specific component to assess performance in the fourth quarter, when halibut rates have historically increased to the highest levels for the year.
- Deck sorting – The sector has spent several years developing a deck sorting program, which allows vessels to deck sort halibut to return halibut to the water quickly, thereby reducing halibut mortality. The sector is currently engaged in its fifth exempted fishing permit (EFP), allowing for continued development of deck sorting protocols that can be incorporated into a regulatory package in the future. Under these EFPs, the codend is pulled forward of the aft live tank hatches to allow space for sorting and is gradually emptied onto the deck. Crewmembers carefully remove halibut while moving the other fish into the tanks. The halibut are slid or carried to a station/table where the observer on duty is positioned. The observer's table typically leads to a chute used to channel halibut off the vessel after counting and sampling. All observer tables must be pre-approved by NMFS prior to deck sorting and video monitoring is used in all locations where crew activities involving sorting and handling of halibut occur.

[7] http://dps.alaska.gov/AWT/
[8] http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section690.htm
[9] https://www.adfg.alaska.gov/static/license/fishing/pdfs/5aac39.pdf
[10] https://www.npfmc.org/committees/enforcement-committee/

The 2018 EFP had the highest level of participation to date. A total of 21 vessels (including 2 vessels outside the Amendment 80 sector) participated, compared to nine in 2015, 12 in 2016, and 17 in 2017. The 2018 EFP also expanded to allow deck sorting of catch in the Gulf of Alaska. A large majority of flatfish catch was taken in the EFP. Vessels also increasingly used deck sorting in the Atka mackerel and Pacific Ocean perch fisheries. In sum, over 260,000 MT of groundfish were harvested in the 2018 EFP. The average halibut DMR in the 2018 EFP was approximately 49%, compared to the default DMR of 84% assigned to trawl Catcher Processor vessels this year.

NMFS is developing a proposed regulatory amendment to implement voluntary halibut deck sorting on trawl catcher processors when operating in non-pollock groundfish fisheries off Alaska. The deck sorting analysis is being completed by NMFS and is in a draft Regulatory Impact Review stage (NPFMC Meeting, Kodiak, June 2018).

3.7 A list of key stakeholders in the fishery and their special interests, where relevant

Considerable numbers of stakeholders participate in the Council and BOF process. A definitive list of stakeholders is not available but minutes of Council and BOF meetings as well as their various advisory committees and working groups are available on their respective websites.

3.8 External factors (such as environmental issues) that may affect the fishery and its management

The effects of environmental variation on production of flatfish in the BSAI and GOA have been studied extensively in terms of physical oceanography, ecosystem variability, and fish production. NMFS and the regional offices coordinate the production of a vast amount of new environmental and other information expected to improve groundfish fishery management in Alaska. Several ecosystem-wide oceanographic phenomena have been identified. The Pacific Decadal Oscillation (PDO), with decadal changes in 'warm' and 'cold' phases has been correlated with a number of factors, including sea level pressure, precipitation, and salmon landing in the Pacific Ocean (https://www.nwfsc.noaa.gov/research/divisions/fe/estuarine/oeip/ca-pdo.cfm).

The flatfish species show interannual variability in recruitment that may be related to El Niño Southern Oscillation (ENSO) driven climate variability. Years of strong onshore transport, typical of warm years in the BS, often corresponds with strong recruitment. The extent and timing of the presence of sea ice in the BS also determines the area where cold bottom water temperatures will persist throughout the following spring and summer. This EBS area of cold water, known as the cold pool, varies with the annual extent and duration of the ice pack and can influence fish distributions.

Current conditions are of an unusually warm phase. Sea surface temperatures as much as 3° C (about 5.4° F) higher than average, lasting for months, and appears on large-scale temperature maps as a red-orange mass of warm water many hundreds of miles across (aka 'the blob'); with a significant area of warm water dominating the GOA and a more recent expanse of exceptionally warm water in the BS. This appears different to normal patterns of ocean conditions such as the ENSO or PDO (Figure 15).

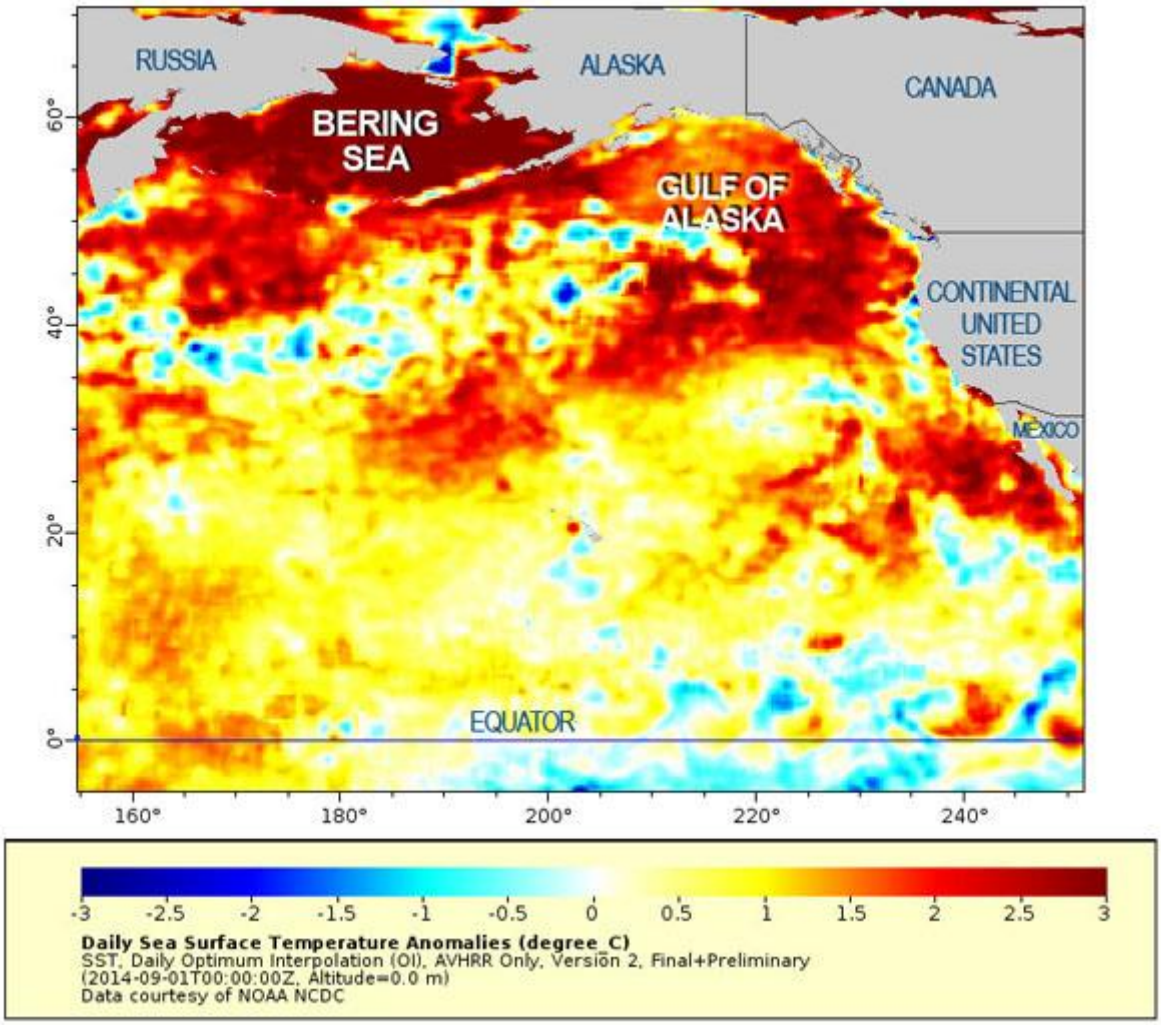


Figure 15. Daily Sea Surface Temperature Anomalies (degree C). Unusually warm temperatures dominate three areas of the North Pacific: the BS, GOA, and an area off Southern California. The darker the red, the further above average the sea surface temperature. Source: https://www.nwfsc.noaa.gov/news/features/food_chain/

An unusual physical characteristic of the BS is the annual ice cover. In summer, the ice edge retreats into the Chukchi and Beaufort Seas whereas, in winter, typically much of the shelf is covered. The sea ice affects exchanges with the atmosphere and inhibits the transfer of freshwater and heat. The creation and melting of the sea ice alter the horizontal and vertical density gradients influencing the mixing and transport of nutrients and organisms within the euphotic zone. The ice edge also serves as both source and sink of freshwater that can affect productivity. Sea ice is also important in influencing bottom temperatures. Thus, the extent of sea ice is related to the distribution and abundance of temperature-sensitive bottom-dwelling species. In recent years, there has been an extreme decrease in sea ice, which has likely had an effect on several species' survivability and reproductive success (Siddon and Zador 2018).

4 THE ASSESSMENT PROCESS

4.1 Original Assessment and Previous surveillance audits

The Alaska Flatfish Complex fishery was first certified under the requirements of the Alaska Responsible Fisheries Management standard v1.2 on 5th of December 2013. The initial certification and two first annual surveillance audits were carried out by the certification body Global Trust (GT).

18 November 2016, the certificate for this fishery was transferred from GT to the DNV GL. The third and the fourth surveillance audit was carried out by the DNV GL. During the fourth surveillance audit, the fishery was transferred under the RFM standard v1.3 and certificate validity was extended from the original expiry date of 4 December 2018 until 4th of December 2019. The permission for certificate extension was granted by ASMI.

4.2 Stakeholder input

The re-assessment audit for this fishery was publicly announced on 16th of May 2019 and stakeholders were invited to register their interest to participate in the assessment of this fishery. No registration requests were received by the assessment team during this consultation opportunity.
The re-assessment audit was performed as an on-site audit in Seatlle, USA. The re-assessment activities were carried out by DNV GL team leader Anna Kiseleva and Fisheries experts Giuseppe Scarcella, Jodi Bostrom and Paul Knapman during 17 -21 June 2019. The assessment team gathered input from the various stakeholders, including: NPFMC, NMFS (including NMFS Habitat Division), Alaska Fisheries Science Centre, At Sea Processors Association, Alaska Fisheries Development Group, US Coast Guard and Alaska Department of Fish and Game. Information gathered is presented in this report and in the enclosed scoring tables (see Chapter 5 below).

ASSESSMENT OUTCOME / SCORING OF THE FUNDAMENTAL CLAUSES

A. The Fisheries Management System

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

FAO CCRF (1995) 7.1.3/7.1.4/7.1.9/7.3.1/7.3.2/7.3.4/7.6.8/7.7.1/10.3.1
FAO Eco (2009) 28
FAO Eco (2011) 35, 37.3

1.1 There shall be an effective legal and administrative framework established at local and national level appropriate for fishery resource conservation and management. The management system and the fishery operate in compliance with the requirements of local, national and international laws and regulations, including the requirements of any regional fisheries management agreement.

FAO CCRF (1995) 7.7.1
FAO Eco (2009) 28
FAO Eco (2011) 35

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The legal and administrative framework is **not** effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery **do not** operate in compliance with relevant fishery management requirements. **Lacking in all parameters.**	The legal and administrative framework is **insufficiently** effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate **insufficiently** in compliance with relevant fishery management requirements. **Lacking in two parameters.**	The legal and administrative framework is **moderately** effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate **only moderately** in compliance with relevant fishery management requirements. **Lacking in one parameter.**	Effective legal and administrative framework established at the local and national level is appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate in compliance with the requirements of local, national and international laws and regulations, including the requirements of any regional fisheries management agreement. **Fulfils all parameters.**

Evaluation Parameters

Process: Management agencies are physically and legally established at local and national level.

Current status: The output of the management organization(s) is in line with fishery resource management needs. Examples may include rule making, scientific research, stock and ecosystem assessments, implementation of rules and regulations, and enforcement activities.

Appropriateness/Effectiveness: The management framework is appropriate for managing the resource. For example, the larger the exploitation, vulnerability, or risks of a fish stock, the more work and precision shall be focused in managing the resource. This shall be done in compliance with legislative and regulatory requirements at the local, national and international level, including the requirements of any regional fisheries management agreement. The management system shall not be subject to continual unresolved or repeated disputes or political instability.

Evidence Basis: Evaluate availability, quality, and adequacy of the evidence. Examples may include fishery management plans or other relevant information.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
The Magnuson-Stevens Fishery Conservation and Management Act[11] (Magnuson-Stevens Act or MSA) is the primary law governing marine fisheries management in US federal waters. The MSA, sets ten National Standards (NS) for fishery conservation and management (16 U.S.C. § 1851).

The National Marine Fisheries Service (NMFS) is an office of the National Oceanic and Atmospheric Administration (NOAA)within the Department of Commerce. NMFS may also be referred to as NOAA Fisheries[12].

For the Alaska region, NMFS have offices in Juneau, Anchorage, Dutch Harbour and Kodiak. They also have the following research laboratories and facilities: Alaska Fisheries Science Centre (AFSC), AFSC Auke Bay Laboratories (Juneau), AFSC Kodiak Laboratory, Ted Stevens Marine Research Institute (Juneau), Subport Dock Facility (Juneau), Little Port Walter Marine Station, St. George Island Field Station and St Paul Island Field Station. NMFS enforcement offices are in Juneau (Alaska Headquarters), Anchorage, Dutch Harbour, Kodiak, Homer, Ketchikan, Petersburg, Seward and Sitka.

Stock status is reviewed annually or biennially depending on the species/stock. Scientists at the AFSC conduct research and stock assessments and produce annual Stock Assessment and Fishery Evaluation (SAFE) reports for the federally managed BSAI and GOA stocks. There are 11 SAFE reports for the Alaskan flatfish considered here (BSAI Alaska plaice, BSAI arrowtooth flounder, BSAI flathead sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI northern rock sole, BSAI yellowfin sole, GOA arrowtooth flounder, GOA flathead sole, GOA northern and southern rock sole and GOA rex sole). These SAFE reports summarize the best-available science, including the fishery dependent and independent data, document stock status and significant trends or changes in the resource, marine ecosystems and fishery over time. The reports also assess the relative success of existing state and Federal fishery management programs and, based on stock status indicators, provide recommendations for annual quotas and other fishery management measures.

The North Pacific Fisheries Management Council[13] (NPFMC) is one of eight regional councils established by the MSA to manage fisheries in the US EEZ. The NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, fishery management plans (FMP) and any necessary amendments for each fishery under its authority that requires conservation and management actions. The NPFMC primarily manages groundfish in the BSAI[14] and GoA[15], targeting Pacific cod, pollock, flatfish, Atka mackerel, sablefish, and rockfish species. The NPFMC offices are in Anchorage.

The majority of the Alaska flatfish complex is harvested in the federal BSAI and GOA fisheries, and is therefore studied, managed, and enforced under the federal FMPs. The FMPs were implemented in 1979 and 1981, respectively. Since that time, the BSAI FMP has been amended over 70 times, and the GOA FMP has been amended over 60 times.

The Alaska Department of Fish and Game (ADFG)[16] is the state department responsible for managing fish resources within state waters (0 – 3 nautical miles (nm)). The basis of natural resource management, including fish and fisheries, is enshrined in Article VIII of the state constitution[17]. The Department's Board of Fisheries[18] (BOF) is established under Alaska Statute 16.05.221[19] for the purposes of the conservation and development of the fisheries resources of the state. This involves setting seasons, bag limits, methods and means for the state's subsistence, commercial, sport, guided sport, and personal use fisheries, and it also involves setting policy and direction for the management of the state's fishery resources. The board is charged with making allocative decisions, and the department is responsible for management based on those decisions.

The BOF has the authority to adopt regulations described in Alaska Statute 16.05.251[20] including: establishing open and closed seasons and areas for taking fish; setting quotas, bag limits, harvest levels

[11] https://www.fisheries.noaa.gov/topic/laws-policies
[12] https://www.fisheries.noaa.gov/about-us
[13] https://www.npfmc.org
[14] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[15] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[16] https://www.adfg.alaska.gov/index.cfm?adfg=fishing.main
[17] https://ballotpedia.org/Article_VIII,_Alaska_Constitution
[18] https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
[19] http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section221.htm
[20] http://www.touchngo.com/lglcntr/akstats/statutes/title16/chapter05/section251.htm

and limitations for taking fish; and establishing the methods and means for the taking of fish. The regulations the BOF has authority over are Title 5 Alaska Administrative Code (AAC) Chapters 1-77[21].

The ADFG consists of the Office of the Commissioner, six divisions, a Boards Support Section, and two associate entities. The six divisions are Commercial Fisheries, Sport Fish, Wildlife Conservation, Habitat, Subsistence, and Administrative Services. The two associated entities are: the Commercial fisheries Entry Commission[22] and the Exxon Valdez Oil Spill Trustee Council[23]

ADFG has 35 offices[24] throughout Alaska. The Headquarters are in Juneau.

The ADFG manages minimal flatfish fisheries in state waters (in the Eastern Gulf of Alaska, Prince William Sound and Cook Inlet), either as bycatch in other fisheries or by special permit. Most flatfish fisheries in state waters are managed concurrent to the federal BSAI or GOA fishery, and are referred to as "parallel fisheries". The parallel fishery is managed by adopting most NMFS rules and management actions, including seasons, and catch in this fishery is counted towards federal quotas.

The US Coast Guard (USCG)[25], NMFS Office of Law Enforcement (OLE)[26] and Alaska Wildlife Troopers (AWT)[27] (a Division of the Alaska Department of Public Safety) conduct at-sea and shore-based inspections. The USCG is the primary agency for at-sea fisheries enforcement. The USCG aims and objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The Alaska region OLE[28] protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries of the EEZ of Alaska. AWT is primarily responsible for enforcing fish and wildlife-related statutes and regulations through the state of Alaska.

The NPFMC Groundfish and Halibut Observer Program[29] (The Observer Program) is an important component of the monitoring of the BSAI and GOA groundfish fisheries. The program is the main data gathering program for biological and fishery data that feed into stock assessment and management.

The NPMC Enforcement Committee[30] is charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea[31]. The Committee is made up of governmental agencies (including OLE, USCG, ADFG, AWT)

With respect to ecosystem monitoring and research a considerable amount of monitoring of the coastal environment in Alaska is performed and supported by multiple federal and state agencies, e.g. NMFS, AFSC, ADFG, institutions of higher learning, e.g. the University of Alaska Fairbanks Institute of Marine Science[32] and organisations that support and facilitate marine research. An example of an on-going and significant monitoring and research initiative is the development of predictive models of the consequences of climate change on ecosystems through monitoring changes in coastal and marine ecosystems, conducting research on climate-ecosystem linkages, and incorporating climate information into physical-biological models. AFSC has established the Ecosystem Monitoring and Assessment Program (EMA), with an overall goal to improve and reduce uncertainty in stock assessment models of commercially important fish species through the collection of observations of fish and oceanography.

Evidence basis:
Comprehensive FMPs for the groundfish fisheries in the BSAI[33] and GoA are reviewed and updated annually.

Management regulations and measures are in place, enforced by federal and state agencies and departments and easily accessible to stakeholders[34] [35].

[21] http://www.touchngo.com/lglcntr/akstats/aac/title05.htm
[22] https://www.cfec.state.ak.us
[23] http://www.evostc.state.ak.us
[24] http://www.adfg.alaska.gov/index.cfm?adfg=contacts.main
[25] https://www.uscg.mil/d17/
[26] https://www.fisheries.noaa.gov/about/office-law-enforcement
[27] http://dps.alaska.gov/AWT/
[28] https://www.fisheries.noaa.gov/contact-directory/noaa-enforcement-field-offices
[29] https://alaskafisheries.noaa.gov/fisheries/observer-program
[30] https://www.npfmc.org/committees/enforcement-committee/
[31] https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf
[32] http://www.uaf.edu/cfos/research/institute-of-marine-scien/
[33] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Research and monitoring of stock status is very comprehensive and detailed information on Alaska groundfish stock assessments is readily available[36].

Ecosystem research, monitoring and modelling is being conducted and related to implications to fish stocks and the marine environment[37]

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☒
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☒

References:

Magnusson Stevens Act, 2007. https://www.fisheries.noaa.gov/topic/laws-policies

NOAA Fisheries https://www.fisheries.noaa.gov/about-us

North Pacific Fisheries Management Council https://www.npfmc.org

North Pacific Fisheries Management Council, BSAI Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

North Pacific Fisheries Management Council, GoA Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

The Alaska Department of Fish and Game (ADFG) https://www.adfg.alaska.gov/index.cfm?adfg=fishing.main

Article VIII of the Alaska State Constitution https://ballotpedia.org/Article_VIII,_Alaska_Constitution

Board of Fisheries https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main

Alaska Statute 16.05.221 http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section221.htm

Alaska Statute 16.05.251 http://www.touchngo.com/lglcntr/akstats/statutes/title16/chapter05/section251.htm

The Commercial Fisheries Entry Commission https://www.cfec.state.ak.us

Exxon Valdez Oil Spill Trustee Council http://www.evostc.state.ak.us

Title 5 Alaska Administrative Code Chapters 1-77 http://www.touchngo.com/lglcntr/akstats/aac/title05.htm

ADFG offices http://www.adfg.alaska.gov/index.cfm?adfg=contacts.main

The US Coast Guard (USCG) https://www.uscg.mil/d17/

NMFS Office of Law Enforcement (OLE) https://www.fisheries.noaa.gov/about/office-law-enforcement

Alaska Wildlife Troopers (AWT) http://dps.alaska.gov/AWT/

Alaska region OLE https://www.fisheries.noaa.gov/contact-directory/noaa-enforcement-field-offices

The NPFMC Groundfish and Halibut Observer Program https://alaskafisheries.noaa.gov/fisheries/observer-program

The NPMC Enforcement Committee https://www.npfmc.org/committees/enforcement-committee/

The NPMC Enforcement Committee – Terms of Reference https://www.npfmc.org/wp-

[34] https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-fisheries-management
[35] https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial
[36] https://www.fisheries.noaa.gov/alaska/population-assessments/north-pacific-groundfish-stock-assessment-and-fishery-evaluation
[37] https://www.fisheries.noaa.gov/alaska/ecosystems/alaska-ecosystem-models

content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

the University of Alaska Fairbanks Institute of Marine Science http://www.uaf.edu/cfos/research/institute-of-marine-scien/

NMFS Management regulations and measures https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-fisheries-management

ADFG commercial fisheries regulations and measure https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial

Alaska groundfish stock assessments https://www.fisheries.noaa.gov/alaska/population-assessments/north-pacific-groundfish-stock-assessment-and-fishery-evaluation

Ecosystem research, monitoring and modelling https://www.fisheries.noaa.gov/alaska/ecosystems/alaska-ecosystem-models

Non-Conformance Number (if relevant):

1.2 Management measures shall consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock.

FAO ECO (2009) 30.3
FAO ECO (2011) 37.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Management measures do not consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. **Lacking in all parameters.**	Management measures **insufficiently consider** 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock**. Lacking in two parameters.**	Management measures **moderately consider** 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock**. Lacking in one parameter.**	Management measures **consider** 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. **Fulfils all parameters.**

Evaluation Parameters

Note on consideration of biological unity and other biological characteristics. Biological unity and biological characteristics shall be interpreted as relating to the stability or resilience of the stock – i.e. its ability to recover from or resist a shock or disturbance, such as the impact of a fishery. The management system must consider the relative ability of the stock to recover from or resist potential negative impacts. Characteristics considered shall include growth, fecundity, reproduction, lifespan, spawning cycle, population dynamics, impact of gear type, and essential habitat(s) needs and availability. Where life cycle and other biological characteristics are unknown, the management system shall ensure these uncertainties are factored into assessment and managing practices, as per the precautionary approach.

Current Status/Appropriateness: If a biological stock unit extends over the jurisdiction of two or more countries to any extent (either by distribution or migration), then exploitation by all parties shall be considered when defining exploitation levels and determining stock health to avoid overfishing/depletion of the resource. The scoring of this parameter shall consider that significant migration may take a species outside the jurisdiction of the managing agency (e.g. for significant feeding or ontogenic migration).

Effectiveness: Managers should conduct an assessment of stock structure and composition as these relate to stock resilience over its entire distribution area. The underlying objective is to preserve genetic variability between and within species, and avoid localized depletions (overall affecting the stock contributing to its resilience and stability). This assessment shall consider, when appropriate, demographic independence of populations or stocks (i.e., if a component stock of a species is demographically independent from another because it is genetically different, has significant difference in age-structure, or if there is insignificant exchange among groups due to distance, environmental barriers, or other reasons).

Effectiveness: The species may spend a portion of its life (migration for feeding, growth or reproduction) in both fresh and saltwater, in international waters or in another country's jurisdiction, and may suffer mortality or other pressures. These must be accounted for when assessing stock health.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include the presence of genetic studies, age-structure data, stock assessments or other relevant information confirming the biological unit of the stock.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Current Status/Appropriateness:
There are 11 SAFE reports for the Alaskan flatfish considered here (BSAI Alaska plaice, BSAI arrowtooth flounder, BSAI flathead sole, BSAI Greenland turbot, BSAI Kamchatka flounder, BSAI northern rock sole, BSAI yellowfin sole, GOA arrowtooth flounder, GOA flathead sole, GOA northern and southern rock sole and GOA rex sole). The GOA and BSAI flatfish stocks are both considered and managed as different stocks and separate from other Pacific stocks further south along the west coast of North America and West across Russia and Asia. In terms of both the fisheries and the groundfish resources, the BSAI and the GOA form distinct management areas.

All fishery removals and mortality of the target stock(s) are considered by management. For both the BSAI and the GOA flatfish stocks (see BSAI and GOA individual flatfish species SAFEs), the management organizations collect the necessary information on removals and mortality (including natural mortality) of the target stock, as well as data on bycatch and discards. Strictly enforced daily landing reports, at sea and shore-based fishery enforcement, fishery observers and an extensive mandatory and voluntary logbook program verify and ground-truth total mortality estimates.

Effectiveness:
The assessment models used for the flatfish stocks take into account sources of fishing mortality and are based on complete catch reporting systems including extensive observer data. Catches from fisheries occurring in state-managed waters are included in the appropriate assessments. All retained catch and discards of flatfish are included in the total catch amounts input into the models. The assessments take into account various relevant aspects of the flatfish species biology. Both BSAI and GOA SAFE reports give extensive histories of the models used in the assessments.

Evidence Basis:
The NMFS/AFSC website has detailed information on flatfish research and stock assessment. The SAFE reports are compiled by the BSAI and GOA Groundfish Plan Teams, which are appointed by the NPFMC. As outlined in the current NPFMC Groundfish FMPs, scientists from the AFSC, ADFG, other agencies, and universities prepare are involved in preparing the SAFE reports. The SAFE documents contain extensive details on the catch and other data time series used in the stock assessments.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Alaska Flatfish Stock Assessment Reports https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments

NMFS Management regulations and measures https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-fisheries-management

ADFG commercial fisheries regulations and measure https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial

Groundfish Plan Teams https://www.npfmc.org/fishery-management-plan-team/goa-bsai-groundfish-plan-team/

North Pacific Fisheries Management Council, BSAI Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

North Pacific Fisheries Management Council, GoA Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Non-Conformance Number (if relevant):

1.2.1 Previously agreed management measures established and applied in the same region shall be taken into account by management.

FAO CCRF (1995) 7.3.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Previously agreed management measures established and applied in the same region are **not** considered. **Lacking in all parameters.**	Previously agreed management measures established and applied in the same region are **insufficiently** considered. **Lacking in two parameters.**	Previously agreed management measures established and applied in the same region are **moderately** considered. **Lacking in one parameter.**	Previously agreed management measures established and applied in the same region are taken into account by management. **Fulfils all parameters.**

Evaluation Parameters

Note: Taken into account means "included and accounted in the basis of management decisions". "Previously agreed measures" includes local or national laws or regulations, and also any management measures put into place by RFMOs. Previous decisions can be reneged, altered and updated or maintained intact but must be included in the decision making process. If previously agreed measures are reneged, altered or updated, there shall be a scientific basis for the changes. Not taken into account may refer to management measures that are ignored although may be still legally binding in the fishery.

Process: There is a process or system that allows the continuity and updating of previously agreed and implemented management measures. Examples may include a specific review process or management plan where these measures can be clearly identified and continued implementation and updating can be carried out.

Current Status/Appropriateness/Effectiveness: Previously agreed-upon management measures established and applied in the same region are included and part of current management decisions. Examples may include international or other agreements not honored by the management system or a management agency. The management system is effectively continuing implementation of agreed management measures.

Evidence Basis: Documentary evidence is available supporting the above.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:

The NPFMC commits to: periodically review all critical components of the FMPs and maintain a continuing review of the fisheries managed under their FMPs; annually review objectives in the management policy statement; and, conduct a complete review of Essential Fish Habitat (EFH) once every 5 years and, in between, will solicit proposals on Habitat Areas of Particular Concern and/or conservation and enhancement measures to minimize potential adverse effects from fishing[38].

[38] https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska

The NPFMC and BOF hold public meetings (the Council meets five times each year[39], usually in February, April, June, October and December; the BOF meetings generally occur from October through March, four to six times per year[40]). These meetings take place in various locations throughout Alaska. The process allows for continuous review and improvement (where needed) of fishery management measures where all fishery stakeholders routinely participate, interact and input within the management process of the groundfish fisheries. In this way, previously agreed measures are reviewed.

Current Status/Appropriateness/Effectiveness:
The Alaska fishery management systems (NMFS/NPFMC and ADFG/BOF) routinely takes into account all previously-agreed management measures. Many examples exist that show the continued implementation of previously agreed regulations for Alaska flatfish management within the Alaska EEZ and state waters. For example, prohibited catch species (PSC) management measures to minimise the bycatch of halibut in the federal groundfish trawl fisheries are regularly reviewed[41] [42].

Evidence Basis:
The FMPs state that, "Objectives identified in the management policy statement will be reviewed annually by the Council. The Council will also review, modify, eliminate, or consider new issues as appropriate, to best carry out the goals and objectives of the management policy." (Section 3.10.2 of the FMPS)". An example of a review of previously-agreed management measures in relation to halibut bycatch can be found on the Council website https://www.npfmc.org/goa-halibut-bycatch/ ; https://www.npfmc.org/bsai-halibut-bycatch/.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Essential Fish Habitat (EFH) https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska

North Pacific Fisheries Management Council (NPFMC) meetings https://meetings.npfmc.org

Board of Fisheries (BOF) meeting schedule 2019/20
https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2019-2020/2019_2020_schedule.pdf

BSAI and GOA Halibut bycatch management in the groundfish fisheries, https://www.npfmc.org/goa-halibut-bycatch/ ; https://www.npfmc.org/bsai-halibut-bycatch/

Non-Conformance Number (if relevant):

Not Applicable – as none of the stocks are considered to be a transboundary, straddling, highly migratory or high seas stock

1.3 Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the applicant management organizations concerned shall cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.

Low Confidence Rating	Medium Confidence Rating	Medium Confidence Rating	High Confidence Rating (Full Conformance)

[39] https://meetings.npfmc.org
[40] https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2019-2020/2019_2020_schedule.pdf
[41] https://www.npfmc.org/bsai-halibut-bycatch/
[42] https://www.npfmc.org/goa-halibut-bycatch/

(Critical NC)	(Major NC)	(Minor NC)	
There is **no** cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question. **Lacking in all parameters.**	There is **insufficient** cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question. **Lacking in two parameters.**	There is **moderate** cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question. **Lacking in one parameter.**	Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the applicant management organizations concerned cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question. **Fulfils all parameters.**

Evaluation Parameters

Note: This clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Where sub-stocks are referred to as part of an overall stock there shall be sufficient information on biology, distribution, and life cycle that demonstrates the degree of association or disassociation, and basis for the management approach taken, to prevent recruitment failure of the stock or other negative impacts that are likely to be irreversible or very slowly reversible.

Process: There is a mechanism in place by which the applicant organization(s) cooperates for the management of the transboundary stock. This mechanism has the sustainable international exploitation of the stock as its main objective.

Current Status/Appropriateness/Effectiveness: There is evidence that the mechanism described in the process parameter is effective at ensuring the stock is sustainably exploited. This can take the form of evidence that the stock is not overfished or subject to overfishing across the entirety of the range of the biological stock.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include proof of formal agreements, records of meetings and decisions.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not Applicable – as none of the stocks are considered to be a transboundary, straddling, highly migratory or high seas stock

1.3.1 Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks, shall be compatible. Compatibility shall be achieved in a manner consistent with the rights, competences and interests of the States concerned.

FAO CCRF (1995) 7.1.3, 7.1.4, 7.1.5, 7.3.2, 10.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** compatibility of management measures for the stock in question. **Lacking in all parameters.**	There is **insufficient** compatibility of management measures for the stock in question. **Lacking in two parameters.**	There is **moderate** compatibility of management measures for the stock in question. **Lacking in one parameter.**	Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks, are compatible. Compatibility is achieved in a manner consistent with the rights, competences and interests of the States concerned. **Fulfils all parameters.**

Evaluation Parameters

Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Compatibility of management measures does not mean identical management measures but the approach shall be consistent with respect to the overall management and conservation goals of the shared or straddling stock.

Process: Identification of common objectives for maintenance of stock biomass.

Current Status/Appropriateness/Effectiveness: Implementation of measures fit to achieve the common objectives mentioned above (i.e., similar harvest rates based on stock status, common rebuilding objectives for depleted stocks).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include proof of formal agreements, records of meetings and decisions, stock assessment and other reports.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not Applicable – as none of the stocks are considered to be a transboundary, straddling, highliy migratory or high seas stock

1.4 A State not member/participant of a sub-regional or regional fisheries management organization shall cooperate, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization/arrangement.

FAO CCRF 7.1.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The non-member or participant State is **not** giving effect to any relevant measures adopted by such organization or arrangement. **Lacking in all parameters.**	The non-member or participant State is **insufficiently** giving effect to any relevant measures adopted by such organization or arrangement. **Lacking in two parameters.**	The non-member or participant State is **moderately** giving effect to any relevant measures adopted by such organization or arrangement. **Lacking in one parameter.**	The State non-member or participant of a sub-regional or regional fisheries management organization cooperates, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization or arrangement. **Fulfils all parameters.**

Evaluation Parameters
Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2.
Process: There is ongoing cooperation in stock assessment, data sharing, and other activities.
Current Status/Appropriateness/Effectiveness: Relevant measures are implemented by non-member country.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports detailing results of common surveys or acceptable harvest rates.

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not Applicable – as none of the stocks are considered to be a transboundary, straddling, highliy migratory or high seas stock

1.4.1 States seeking to take any action through a non-fishery organization which may affect the conservation and management measures taken by a competent sub-regional or regional fisheries management organization or arrangement shall consult with the latter, in advance to the extent practicable, and take its views into account.

FAO CCRF 7.3.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no prior** consultation with the fisheries management organization / arrangement. **Lacking in all parameters.**	There is **insufficient** prior consultation with the fisheries management organization / arrangement. **Lacking in two parameters.**	There is **moderate** prior consultation with the fisheries management organization / arrangement. **Lacking in one parameter.**	The State seeking to take any action through a non-fishery organization which may affect the conservation and management measures taken by a competent sub-regional or regional fisheries management organization or arrangement consults with the latter, in advance to the extent practicable, and take its views into account. **Fulfils all parameters.**

Evaluation Parameters
Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2.
Process: There is a history of prior consultation.
Current Status/Appropriateness/Effectiveness: The views of the managing fishery organization are taken into account.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports detailing action taken by the state in question.

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not Applicable – as none of the stocks are considered to be a transboundary, straddling, highly migratory or high seas stock

1.5 The Applicant fishery's management system shall actively foster cooperation between States with regard to 1) information gathering and exchange, 2) fisheries research, 3) fisheries management, and 4) fisheries development.

***FAO CCRF* 7.3.4**

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The Applicant fishery's management system does **not** actively foster cooperation between states. **Lacking in all parameters.**	The Applicant fishery's management system fosters **insufficient** cooperation between states with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. **Lacking in two parameters.**	The Applicant fishery's management system fosters **moderate** cooperation between states with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. **Lacking in one parameter.**	The Applicant fishery's management system **fosters active international cooperation** on fishery matters with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. **Fulfils all parameters.**

Evaluation Parameters
Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2.
Process: The extent to which a formal process or system is available.
Current Status/Appropriateness/Effectiveness: Level of activity, application and level of engagement.
Evidence Basis: Outputs from activity (e.g., reports, minutes, common or collective themes).

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

1.6 States and sub-regional or regional fisheries management organizations and arrangements, as appropriate, shall agree on the means by which the activities of such organizations and arrangements will be financed, bearing in mind, *inter alia*, the relative benefits derived from the fishery and the differing capacities of countries to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements shall aim to recover the costs of fisheries conservation, management and research.

FAO CCRF 7.7.4

Low Confidence	**Medium Confidence**	**Medium Confidence**	**High Confidence**

Rating (Critical NC)	Rating (Major NC)	Rating (Minor NC)	Rating (Full Conformance)
The State and sub-regional or regional fisheries management organizations and arrangements, as appropriate do **not** agree on the means by which the activities of such organizations and arrangements are financed. **Lacking in all parameters.**	The State and sub-regional or regional fisheries management organizations and arrangements, as appropriate**, insufficiently** agree on the means by which the activities of such organizations and arrangements are financed. **Lacking in two parameters.**	The State and sub-regional or regional fisheries management organizations and arrangements, as appropriate**, moderately** agree on the means by which the activities of such organizations and arrangements are financed. **Lacking in one parameter.**	Agreement on the means by which the activities of such organizations and arrangements are financed. Where appropriate, and when possible, such organizations and arrangements aim to recover the costs of fisheries conservation, management and research. **Fulfils all parameters.**

Evaluation Parameters
Process: There is an agreed-upon system to finance the fishery management organizations and arrangements.
Current Status/Appropriateness/Effectiveness: The fishery management organizations and arrangements are currently financed using a cost recovery or other system.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include data showing the expenditure and cost recovery derived from fisheries management.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
There is an agreed-upon system to finance the fishery management organizations and arrangements. In general, the costs of fisheries management and conservation are funded through Congressional and state appropriations that follow the federal and state budget cycles.

The federal budget cycle[43] can be summarised in the following steps:

1. Office of Management and Budget (OMB)[44] issues budget guidance NMFS submits its budget
2. Department of Commerce (DOC) and NOAA issue budget guidance
3. NMFS submits its budget to NOAA
4. NOAA submits it budget to DOC
5. DOC submits its budget to OMB
6. President's budget delivered to Congress
7. NOAA and DOC discuss the proposed budget with Congress
8. Deliberations by congressional appropriations committees
9. Budget execution
10. Spending and performance information sent to OMB – back to step 1

The state budget cycle[45] can be summarised in the following steps:

1. State agencies, e.g. ADFG, prepare and send their budgets to the Governor's Office of Budget Review.
2. The Governor's Office of Budget Review checks agency requests and prepares recommendations to the Governor.
3. The Governor reviews, sets budget amounts and submits the appropriation bill and budget documents to the State.
4. The House and Senate Rules Committees introduce companion bills (similar or identical bills) for the House and Senate Finance Committees to review.
5. Subcommittees work on the budgets for each department and submit recommendations to

[43] https://www.corporateservices.noaa.gov/nbo/
[44] https://www.whitehouse.gov/omb/
[45] http://akleg.gov/docs/pdf/budgproc.pdf

the full Finance Committees.

6. The full House Finance Committee finalizes the budget for each Department and moves a Committee Substitute bill out of committee.
7. The bill goes to the floor of the House in second reading and can be amended. Then the bill is moved to third reading, voted on, and sent to the Senate.
8. The Senate Finance Committee completes their work and sends their own Committee Substitute to the floor of the Senate, where it can be amended and then voted on.
9. The Senate version is sent back to the House for concurrence. Typically, the House does not concur, but asks the Senate to recede from their amendments.
10. Typically, the Senate does not recede, and a conference committee is appointed.
11. The Conference Committee works out a compromise version of the budget.
12. The House and Senate approve the Conference Committee Substitute and send it to the Governor.
13. The Governor reviews the bill and may exercise his line item veto power.
14. The bill becomes law and is effective with the beginning of the fiscal year on July 1.

Wherever possible, in addition to appropriations, NMFS and ADFG look to help recover costs where they can.

Current Status/ Appropriateness/Effectiveness:
Perhaps the best example of cost recovery is the current groundfish observer program[46] which is funded through an industry fee equal to 1.25% of the retained value of groundfish and halibut in fisheries subject to partial observer coverage. Processors and registered buyers are billed in January for observer fees based on the landings and value in the previous calendar year. The fee is split evenly between the vessel owner/operator and processor or registered buyer.

Section 304(d) of the MSA authorizes and requires the collection of cost recovery fees for limited access privilege programs and the Community Development Quota (CDQ) Program[47]. Cost recovery fees recover the actual costs directly related to the management, data collection, and enforcement of the programs. Section 304(d) of the MSA mandates that cost recovery fees not exceed 3% of the annual ex-vessel value of fish harvested by a program subject to a cost recovery fee, and that the fee be collected either at the time of landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

It should be noted that, cost recovery fees do not increase agency budgets or expenditures, they simply offset funds that would otherwise have been appropriated, the only exception is when ADFG are subject to expenditures for which there is no direct appropriation.

Evidence Basis:
Estimates of the costs for federal and state management, research and enforcement of the groundfish stocks in the BSAI and GOA are reported in the BSAI and GOA Groundfish FMPs (section 6.2.1)[64,65]. Owing to the multifunctional role that many of the management organisations have, obtaining a precise figure for the expenditure on specific fisheries in the BSAI and GOA is not possible, however, estimates are provided for the cost of fishery management by the government agencies, e.g.

	$ million			
Agency	**Overall Alaska region expenditure**	**Groundfish Fisheries**	**BSAI**	**GOA**
North Pacific Fisheries Management Council (NPFMC)	3.0	2.4	0.8	1.6
National Marine Fisheries Service (NMFS):				
- Sustainable Fisheries Division	3.6	2.9	0.9	2.0
- Protected Resources Division	2.2	0.8	No estimate	
- Habitat conservation Division	1.6	0.4	0.2	0.2
- Restricted Access Management	1.9	0.4	0.3	0.1
- Other NMFS Regional Alaska units	6.2	3.5	1.0	2.5
- Alaska Fisheries Science Centre	40.9	28.2	11.9	16.3

[46] https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program
[47] https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska

NOAA Office of General Council	2.0			
NOAA Office of Law Enforcement	5.0	2.4	1.8	0.6
US Coast Guard – 17th District		<40.2	<13.9	<26.3
Alaska Department of Fish & Game (ADFG)		>2.5		

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

The federal budget cycle https://www.corporateservices.noaa.gov/nbo/

Office of Management and Budget (OMB) https://www.whitehouse.gov/omb/

Alaska state budget cycle http://akleg.gov/docs/pdf/budgproc.pdf

North Pacific Groundfish Observer Program https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program

Community Development Quota (CDQ) Program https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska

NPFMC BSAI Groundfish FMP https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC GOA Groundfish FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Non-Conformance Number (if relevant):

Not applicable - The fishery takes place within the EEZ

1.6.1 Without prejudice to relevant international agreements, States shall encourage banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures.

FAO CCRF 7.8.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The State **does** encourage banks and financial institutions to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership.	The State **insufficiently** encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership.	The State only **moderately** encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership.	The State encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management

Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	measures. **Fulfils all parameters.**

Evaluation Parameters
Note: The fishery for the stock under consideration occurs outside the exclusive economic zone (EEZ), there is evidence for presence of flags of convenience, and for IUU fishing. Not Applicable otherwise.
Process: There is a system that encourages banks to require vessels to be flagged outside the jurisdiction of interest.
Current Status/Appropriateness/Effectiveness: There is regulation that directs for vessels to be flagged outside the state's jurisdiction. The fishery for the stock under consideration occurs outside EEZ, and there are flags of convenience operations present, or evidence of illegal, unreported, and unregulated fishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include data showing fishery operation by vessels flying a flag different from that of the state where fishing geographically occurs.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Conclusion

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

1.7 Procedures shall be in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information.

- Review procedures shall be established within the management system.
- A mechanism for revision of management measures shall exist**.**

FAO CCRF 7.6.8

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** procedures in place to review the efficiency of current conservation and management measures. **Lacking in all parameters.**	There are **insufficiently** effective procedures in place to review the efficiency of current conservation and management measures. **Lacking in two parameters.**	There are **moderately** effective procedures in place to review the efficiency of current conservation and management measures. **Lacking in one parameter.**	Procedures are in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a procedure to review management measures. The procedure includes the use of outcome indicators against which the success of management measures in achieving specific management objectives is measured. The procedure covers all management measures, including those

relating to the sustainable exploitation of the target stock, the mitigation of negative impacts on non-target species through bycatch, discarding, and indirect effects, and the protection of ETP species and the physical environment.
Current Status/Appropriateness/Effectiveness: If, as a result of the review process, it is determined that management measures are not achieving the specific management objectives they are designed to achieve, they are revised and updated as appropriate.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include data showing recent regulation revisions.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
There are procedures at multiple levels to review management measures.

The principle legislative instrument – the MSA - that established the management framework, is reviewed by Congress every five years and is periodically revised and reauthorized.

The adaptive management approach taken in the Alaska flatfish fisheries requires regular and periodic review. Component parts of the FMPs are regularly reviewed, including outcome indicators, and various levels of Environmental Impact Statements (EIS) are undertaken when the FMPs are amended in order to review the environmental and socio-economic consequences, as well as assess the effectiveness of the changes, e.g. To incorporate the regulatory guidelines for review and revision of essential fish habitat (EFH) components, the Council conduct a review of all the EFH components of each FMP once every 5 years; SAFE reports are reviewed and updated annually and made available on-line

Stakeholders are actively encouraged to participate in Council and BOF meetings and, in so doing, opportunity to review management measures is provided.

Current Status/Appropriateness/Effectiveness:
As a result of the adaptive management approach, if it is determined that management measures are not working, or, not working as effectively as they might be, the management system facilitates their revision. As a result, Amendments to the FMPs and changes in state regulations are introduced.

Evidence basis:
Section 3.10 of the FMPs details the NPFMC review of the FMPs, including, the procedure for evaluation and the schedule for review. The FMP states that the Council will maintain a continuing review of the fisheries managed under the FMPs through the following methods:

1. Maintain close liaison with the management agencies involved, usually the ADFG and NMFS, to monitor the development of the fisheries and the activity in the fisheries.
2. Promote research to increase their knowledge of the fishery and the resource, either through Council funding or by recommending research projects to other agencies.
3. Conduct public hearings at appropriate times and in appropriate locations to hear testimony on the effectiveness of the management plans and requests for changes.
4. Consider all information gained from the above activities and develop, if necessary, amendments to the FMP. The Council will also hold public hearings on proposed amendments prior to forwarding them to the Secretary for possible adoption.

With respect to the schedule for review, the Council commits to maintaining a continuing review of the fisheries managed under the FMPs, and periodic reviews of all critical components of the FMP. This includes annually reviewing the objectives in the management policy statement and, once every 5 years, reviewing and amending, as appropriate, the Essential Fish Habitat (EFH) components of the FMPs.

Council meetings are open, and public testimony – both written and oral – is taken on every issue prior to deliberations and final decisions. Public comments are also taken at all Advisory Panel and Scientific and Statistical Committee meetings. Written comments can be submitted. Any letters that are submitted are put in the Council notebooks. New issues to the Council, are usually addressed at the end of the meeting under an agenda item called "Staff Tasking." The public are given a chance to comment on these items during an open forum[48].

[48] https://www.npfmc.org/how-do-i-get-involved/

The BOF also provides opportunity for input through public notification and their website[49] of upcoming meetings and opportunities to input into the management process.

Stock status is reviewed annually or biennially depending on the species/stock. Scientists at the AFSC conduct research and stock assessments and produce annual SAFE reports for the federally managed BSAI and GOA stocks. These SAFE reports summarize the best-available science, including the fishery dependent and independent data, document stock status and significant trends or changes in the resource, marine ecosystems and fishery over time. The reports also assess the relative success of existing state and Federal fishery management programs and, based on stock status indicators, provide recommendations for annual quotas and other fishery management measures.

The stock assessments are peer reviewed by experts and recommendations are made to improve the assessments. An additional level of peer review by external experts is conducted periodically.

The MSA requires the NPFMC to minimise bycatch while also allowing for optimum yield in the fisheries. The Council has implemented and continues to refine measures to reduce bycatch of prohibited species, such as Pacific halibut, Chinook and chum salmon, and some species of crab in the Federal fisheries.

The National Environmental Policy Act (NEPA) [50] requires agencies to prepare an Environmental Impact Statement (EIS) on proposals for legislation and other major Federal actions that may significantly affect the quality of the human environment (40 CFR 1502.3[51]). EISs are also prepared: (1) when the proposed action is novel; (2) when there is controversy in the underlying science used to understand the impacts of the alternatives; or, (3) when the potential impacts are unknown. All of the NPFMC proposed regulations and the FMPs include NEPA considerations[52]. These serve as a review of the consequence of any significant management action or measure.

The BSAI and GOA FMPs were implemented in 1979 and 1981, respectively. Since that time, the BSAI FMP has been amended over 70 times, and the GOA FMP has been amended over 60 times. Each FMP amendment was supported by the required level of analysis under NEPA. In 2004, an Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (PSEIS) was undertaken. This was a major review and analysis of the effect of the groundfish fisheries on the North Pacific Ecosystem and provided the NPFMC, NMFS, ADFG and stakeholders with information to further inform decision-making as to the consequences of the FMPs. In 2015, the NPFMC produced a PSEIS Supplemental Information Report[53] which updated the 2004 PSEIS.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPFMC BSAI Groundfish FMP https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC GOA Groundfish FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

North Pacific Groundfish Stock Assessment and Fishery Evaluation Reports
https://www.afsc.noaa.gov/Publications/assessments.htm

How to get involved in the MPFMC process https://www.npfmc.org/how-do-i-get-involved/

ADFG Board of Fisheries Process https://www.adfg.alaska.gov/index.cfm?adfg=process.main

[49] http://www.adfg.alaska.gov/index.cfm?adfg=process.comments
[50] https://www.epa.gov/nepa
[51] https://www.law.cornell.edu/cfr/text/40/1502.3
[52] https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-fisheries-programmatic-supplemental-environmental-impact
[53] https://www.npfmc.org/wp-content/PDFdocuments/fmp/Final_SIR_2015.pdf

Submitting comments to the Board of Fisheries process
http://www.adfg.alaska.gov/index.cfm?adfg=process.comments

National Environmental Protection Act (NEPA) https://www.epa.gov/nepa

National Environmental Protection Act. Code of Federal Regulations (CFR). Title 40. Protection of Environment; Environmental Impact Statements (40 CFR 1502.3)
https://www.law.cornell.edu/cfr/text/40/1502.3

Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement and Supplemental Information Report 2015. https://www.npfmc.org/wp-content/PDFdocuments/fmp/Final_SIR_2015.pdf

Non-Conformance Number (if relevant):

1.8 The management arrangements and decision making processes for the fishery shall be organized in a transparent manner.
- Management arrangements,
- Decision making.

FAO CCRF 7.1.9

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** transparency in management arrangements and decision making processes. **Lacking in all parameters.**	There is **insufficient** transparency in management arrangements and decision making processes. **Lacking in two parameters.**	There is **moderate** transparency in management arrangements and decision making processes. **Lacking in one parameter.**	The management arrangements and decision making processes for the fishery are organized in a transparent manner. **Fulfils all parameters.**

Evaluation Parameters
Current Status: There is transparency in management arrangements.
Effectiveness: There is transparency in decision making processes.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include records of the management arrangements and decision making processes.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Current Status:
Management arrangements for the Alaska flatfish fisheries are easily accessible on the, NMFS[54], and ADFG [55] websites and from NMFS and ADFG offices as well as local offices of the Office of Law Enforcement (OLE)[56] and Alaska State Wildlife troopers (AWT)[57].

Effectiveness:
The NPFMC imposes transparency so that all Council member's discussions are open to the public. No more than a predetermined number of Council members can meet together unless the meeting is an open public meeting. Each Council decision is made by recorded vote in a public forum after public comment. Final decisions then go to the Secretary of Commerce for a second review, public comment, and final approval. Decisions must conform with the MSA, the NEPA, Endangered Species Act (ESA)[58], Marine Mammal Protection Act (MMPA)[59] and other applicable law including several executive orders.

[54] https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska
[55] http://www.adfg.alaska.gov/index.cfm?adfg=regulations.main
[56] https://www.fisheries.noaa.gov/topic/enforcement
[57] https://dps.alaska.gov/AWT/Home
[58] https://www.fws.gov/endangered/laws-policies/
[59] https://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/marine-mammal-protection-act.html

The BOF also holds multiple public meetings each year at various locations throughout Alaska and establishes similar decision-making processes, with each BOF decision being recorded in a public forum after public comments.

Evidence Basis:
The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all Council and BOF deliberations are conducted in open, public session. Anyone may submit regulatory proposals, and all such proposals are given due consideration by both the NPFMC and the BOF.

The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process[60] and the Council Statement of Organisation Practices and Procedures[61].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Regulations, Acts, Treaties, and Agreements for Federal Fisheries in Alaska
https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska

ADFG Fisheries Regulations http://www.adfg.alaska.gov/index.cfm?adfg=regulations.main

NOAA Fisheries Enforcement https://www.fisheries.noaa.gov/topic/enforcement

Alaska State Wildlife troopers (AWT) https://dps.alaska.gov/AWT/Home

Endangered Species Act (ESA) https://www.fws.gov/endangered/laws-policies/

Marine Mammal Protection Act (MMPA) https://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/marine-mammal-protection-act.html

NPFMC guide for navigating the Council process
https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

Council Statement of Organisation Practices and Procedures https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/SOPPs_NPFMC_April2012_v2.pdf

Non-Conformance Number (if relevant):

Not applicable – The Alaska flatfish fisheries do not occur on the high seas

1.9 Management organizations not party to the Agreement to promote compliance with international conservation and management measures by vessels fishing in the high seas shall be encouraged to accept the Agreement and to adopt laws and regulations consistent with the provisions of the Agreement.

FAO CCRF 8.2.6

Low Confidence Rating	Medium Confidence Rating	Medium Confidence Rating	High Confidence Rating (Full Conformance)

[60] https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf
[61] https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/SOPPs_NPFMC_April2012_v2.pdf

(Critical NC)	(Major NC)	(Minor NC)	
There is **no** accepted Agreement and consistent laws and regulations. **Lacking in all parameters.**	The management system has accepted the Agreement but with **insufficient** adoption of consistent laws and regulations. **Lacking in two parameters.**	The management system has accepted the Agreement but with **moderate** adoption of consistent laws and regulations. **Lacking in one parameter.**	The Fishery Management organization is party to the Agreement to promote compliance with international conservation and management measures by vessels fishing in the high seas or has adopted laws and regulations consistent with the provisions of the Agreement. **Fulfils all parameters.**

Evaluation Parameters
Not Applicable if the fishery does not occur in high seas.
Process: The Agreement is accepted and relevant regulation adopted.
Current Status/Appropriateness/Effectiveness: These laws are regulating high seas fishing activity. Describe how they accomplish this.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on the management of high seas fishing activities.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 10.1.1/10.1.2/10.1.4/10.2.1/10.2.2/10.2.4

2.1 An appropriate policy, legal and institutional framework shall be adopted in order to achieve sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development. In setting policies for the management of coastal areas, 4) States shall take due account of the risks and uncertainties involved.

FAO CCRF (1995) 10.1.1, 10.1.3, 10.2.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
An appropriate policy, legal and institutional frameworks is **not** adopted in order to achieve sustainable and integrated use of living marine resources**,**	Policy, legal and institutional frameworks have been adopted but are **insufficient** to achieve sustainable and integrated use of living	Policy, legal and institutional frameworks have been adopted but are **moderately** achieving sustainable and integrated use of living	An appropriate policy, legal and institutional framework has been adopted in order to achieve sustainable and integrated use of living marine resources, taking

taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in all parameters.**	marine resources**,** taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in two parameters.**	marine resources**,** taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in one parameter.**	into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development. In setting policies for the management of coastal areas, States 4) take due account of the risks and uncertainties involved. **Fulfils all parameters.**

Evaluation Parameters

Process: A mechanism exists by which the integrated management of multiple coastal area uses is conducted, the possible uses of coastal resources are assessed, and access to them is governed. Accordingly, policies for the management of the coastal area are set.

Current Status/Appropriateness/Effectiveness: The coastal management framework includes explicit consideration of the fragility of coastal ecosystems, the finite nature of coastal resources, and the needs of coastal communities, and accounts for the rights and customary practices of coastal communities. These policies take due account of risks and uncertainties.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include coastal management plans or other policy documents and frameworks for resource/coastal management.

Process

The Coastal Zone Management Act 1972 (as amended)[62] (CZMA) (16 U.S.C. 1451 et seq.) was designed to encourage and assist states in developing coastal management programs, to coordinate state activities, and to safeguard regional and national interests in the coastal zone. The Alaska Coastal Management Program (ACMP) was approved by NOAA in 1979 as a voluntary state partner in the National Coastal Management Program. However, in 2011 Alaska withdrew from the program. As a result, coastal zone management matters are addressed at a federal level in accordance with the policies set forth in NEPA.

To implement NEPA's policies, Congress prescribed a procedure, commonly referred to as "the NEPA process" or "the environmental impact assessment process."[63] The NEPA process provides public information and opportunity for public involvement at both the state and federal levels. When a company applies for a permit (e.g. a building application that will impact coastal) the agency that is being asked to issue the permit must evaluate the environmental effects of the permit decision under NEPA.

The NMFS, NPFMC and ADFG have processes, committees and groups that allow potential coastal zone developments and issues to be brought to formal review and engagement such as the NPFMC or the BOF meetings.

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

[62] https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg1280.pdf
[63] https://www.epa.gov/nepa/national-environmental-policy-act-review-process

programs including the U.S. Forest Service, U.S. Fish and Wildlife Service, NMFS Pacific Marine Environmental Lab (PMEL), NOAA's Office for Coastal Management, the Alaska Department of Environmental Conservation (ADEC) Division of Water, ADFG Habitat Division, the AFSC's "Ecosystem Monitoring and Assessment Program", The NMFS' Habitat Conservation Division (HCD) and their Essential Fish Habitats (EFH) monitoring and protection program, the U.S. Coast Guard, the NMFS Alaska Regional Office's Restricted Access Management Program (RAM), Alaska Coastal and Estuarine Land Conservation Program, 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.

Current Status/Appropriateness/Effectiveness:
In managing the Alaska groundfish fisheries, NMFS, in conjunction with the NPFMC and ADFG, participate in coastal area management-related issues through processes established by the NEPA. NEPA requires that all federal agencies' funding or permitting decisions be made with full consideration of the impact to the natural and human environment. An environmental review process is required that includes a risk evaluation and evaluation of alternatives including a, "no action" alternative.

The NPFMC and the BOF system was designed so that fisheries management decisions were made at the regional level to allow input from affected stakeholders. NPFMC meetings are open, and public testimony is taken on issues prior to deliberations and final decisions. In so doing, the management organizations within Alaska and their management processes consider the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development[64,65].

ADFG participates in land use review processes that include land use planning, permit and lease reviews for activities on State lands and waters, and reviewing land disposals that may affect fish and wildlife and public use of these resources. ADFG staff also review proposed land development activities on federal lands under the Alaska National Interest Lands Conservation Act (ANILCA) on actions under the Alaska Native Claims Settlement Act (ANCSA).

Evidence Basis:
NOAA has set out their policy and procedures for compliance with NEPA[66] which explicitly sets out NEPA procedures in relations to fisheries. The NMFS Alaska region website also includes all the on-going EFH consultations in relation to coastal development proposals[67].

As well as the NPFMC and BOF meeting process allowing for coastal zone management and any community concerns or needs to be formally aired within a public forum. The NMFS and ADFG websites[68] also provide information on their input into planning processes.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

The Coastal Zone Management Act 1972 (as amended) https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg1280.pdf

NPFMC Summary Reports https://www.npfmc.org/summary-reports/

NEPA Process https://www.epa.gov/nepa/national-environmental-policy-act-review-process

NPFMC - Celebrating 40 Years of Sustainable Fisheries https://www.npfmc.org/wp-content/PDFdocuments/resources/MSA40Booklet.pdf

[64] https://www.npfmc.org/summary-reports/
[65] https://www.npfmc.org/wp-content/PDFdocuments/resources/MSA40Booklet.pdf
[66] https://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-01132017.pdf
[67] https://alaskafisheries.noaa.gov/habitat-consultations/search?search_api_views_fulltext=
[68] http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions

NOAA - Conserving Habitat in the Alaska Region https://www.fisheries.noaa.gov/alaska/habitat-conservation/conserving-habitat-alaska-region?search_api_views_fulltext

NOAA Companion Manual Policy and Procedures for Compliance with the national Environmental Policy Act and Related Authorities https://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-01132017.pdf

NMFS Alaska Region Habitat Consultation https://alaskafisheries.noaa.gov/habitat-consultations/search?search_api_views_fulltext=

ADFG Special Area Management planning
http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions

Non-Conformance Number (if relevant):

2.1.1 States shall establish mechanisms for cooperation and coordination among national authorities involved in planning, development, conservation and management of coastal areas.

FAO CCRF 10.4.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** cooperation/coordination with adjacent jurisdictions involved in planning, development, conservation and management of coastal areas. **Lacking in all parameters.**	There is **insufficient** cooperation/coordination with adjacent jurisdictions involved in planning, development, conservation and management of coastal areas. **Lacking in two parameters.**	There is **moderate** cooperation/coordination with adjacent jurisdictions involved in planning, development, conservation and management of coastal areas. **Lacking in one parameter.**	The State establishes mechanisms for cooperation and coordination among national authorities involved in planning, development, conservation and management of coastal areas. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism to allow cooperation between neighboring countries to improve coastal resource management.
Current Status/Appropriateness/Effectiveness: There are records of cooperation. Examples may include fishery, aquaculture, or other agreements or records from international fora.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports or data on the international cooperation/information exchange in these events.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process, Current Status/Appropriateness/Effectiveness, Evidence Basis
The only other coastal state in the Bering Sea is Russia. Given the distance between the more populated regions of each country is vast, the need for a mechanism to allow for cooperation between neighbouring countries to improve coastal resource management is not applicable in this instance.

Canada abuts the US border to the south and shares fisheries resources. The US and Canada have a very strong working relationship at both the national and regional levels. In cases involving boundary disputes and treaties governing fishery access, the USCG, NOAA and Canadian Department of Fisheries and Oceans (DFO) along with Canadian Coast Guard (CCG) counterparts have effectively coordinated living marine resource enforcement efforts despite occasional related political and economic tensions.

There are established agreements and shared management and working practices, e.g. International

Pacific Halibut Commission[69], Pacific Salmon Treaty[70], Agreement between the US and Canada on enforcement[71].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

International Pacific Halibut Commission http://www.iphc.int

Pacific Salmon Treaty http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/

Agreement between the US and Canada on enforcement
http://www.nmfs.noaa.gov/ia/agreements/LMR%20report/us_canada_fisheries_enforcement.pdf

Non-Conformance Number (if relevant):

2.1.2 States shall ensure that the authority or authorities representing the fisheries sector in the coastal management process have the appropriate technical capacities and financial resources.

FAO CCRF (1995) 10.4.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** access to appropriate technical capacities and financial resources. **Lacking in all parameters.**	There is **insufficient** access to appropriate technical capacities and financial resources. **Lacking in two parameters.**	There is **moderate** access to appropriate technical capacities and financial resources. **Lacking in one parameter.**	The State ensures that the authority or authorities representing the fisheries sector in the coastal management process have the appropriate technical capacities and financial resources. **Fulfils all parameters.**

Evaluation Parameters
Process: There are appropriate technical capacities and financial resources.
Current Status/Appropriateness/Effectiveness: It can be determined with confidence that there are appropriate technical capacities and financial resources.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports or data overall operating staff and financial resources/budgets available.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
The technical capacities of the federal and state agencies involved in the management of the Alaska flatfish fisheries are significant, amongst others, they can boast internationally recognized scientists, seasoned fishery managers and policy makers and highly professional and trained enforcement officers.

Current Status/Appropriateness/Effectiveness:
During the site visit, no indication was given regarding a lack of resources or technical capacity within the agencies responsible for managing the fisheries. Given the positive state of the fishery resource and the science and management system in place through NMFS, NPFMC and ADFG the assessment team is confident that there are appropriate technical and financial resources in place.

Evidence Basis:

[69] http://www.iphc.int
[70] http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/
[71] http://www.nmfs.noaa.gov/ia/agreements/LMR%20report/us_canada_fisheries_enforcement.pdf

The federal and state financial resources are outlined under clause 1.6 above.

NMFS and AFDG staffing complement are available on their respective websites[72,73].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NOAA Alaska Regional office https://www.fisheries.noaa.gov/about/alaska-regional-office

ADFG Organisational Structure http://www.adfg.alaska.gov/index.cfm?adfg=about.structure

Non-Conformance Number (if relevant):

2.2 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**.** The public shall also be kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected.

FAO CCRF (1995) 10.1.2, 10.2.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** consultation with the fishery sector and fishing communities, and **no** attempts to create public awareness. **Lacking in all parameters.**	There is **insufficient** consultation with the fishery sector and fishing communities, and insufficient attempts to create public awareness. **Lacking in two parameters.**	There is **moderate** consultation with the fishery sector and fishing communities, and moderate attempts to create public awareness. **Lacking in one parameter.**	Representatives of the fisheries sector and fishing communities are consulted in the decision making processes involved in other activities related to coastal area management planning and development**.** The public is also kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected. **Fulfils all parameters.**

Evaluation Parameters
Process: Describe how fishery related information is disseminated and the process in place to consult with fishery sector and fishing communities.
Current Status/Appropriateness/Effectiveness: There are records of consultations with fishing communities and the fisheries sector. Attempts have been made to create public awareness on the need for protection and management of coastal resources, and those affected by the management process have been made aware of its provision.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include public records of consultation activities and other available documentation, published on the internet or distributed at public meetings.

[72] https://www.fisheries.noaa.gov/about/alaska-regional-office
[73] http://www.adfg.alaska.gov/index.cfm?adfg=about.structure

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes[74]. These include consultation and 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. To implement NEPA's policies, Congress prescribed a procedure, commonly referred to as "the NEPA process" or "the environmental impact assessment process"[75]. The NEPA processes provide public information and opportunity for stakeholder involvement at both the state and federal levels. In this way, any application for a permit to undertake an activity or development in the coastal region, requires the agency that is being asked to issue the permit to evaluate the environmental effects of the permit and follow the NEPA process.

As a result, representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and in other activities related to coastal area management planning and development. This happens through the NPFMC and BOF meeting process, NEPA processes and proceedings, as well as through public review processes organised by NMFS. Please refer to previous Clauses (2.1, 1.7, 1.8) for further information and references.

Current Status/Appropriateness/Effectiveness:
All the fishery agencies have processes, committees and groups that allow coastal zone resource management issues to be brought to formal review and engagement. As well as the NPFMC and BOF public meetings being key forums for consulting and creating awareness of issues to do with coastal resource management and their potential impact on fish stocks and socio-economic interests, the Council has established a rural community engagement outreach committee[76] to better inform coastal residents heavily reliant on subsistence fisheries and other marine resources, on the work of the Council, current and future issues and how they may get involved and contribute to the decision-making process. At the State level, land use and access planning is considered to be a collaborative and adaptive process by which land managers, biologists, members of the public, and local stakeholder groups work together to produce State Area and Management Plans[77] that guide and inform the day-to-day decisions that impact the use and development of Alaska's land and water resources.

Evidence Basis:
The NPFMC and BOF websites actively encourage and demonstrate participation by stakeholders at their respective public meetings and cover a wide range of topics regarding the use, development and management of coastal resources. Furthermore, the Council and ADFG are statutorily obliged to establish or participate in more regional or local fora in order to engage stakeholders and encourage their contribution to the decision-making process [78,79,80].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NEPA Directives https://www.fisheries.noaa.gov/national/laws-and-policies/national-environmental-policy-act-directives

NEPA Process https://www.epa.gov/nepa/national-environmental-policy-act-review-process

[74] https://www.fisheries.noaa.gov/national/laws-and-policies/national-environmental-policy-act-directives
[75] https://www.epa.gov/nepa/national-environmental-policy-act-review-process
[76] https://www.npfmc.org/outreach/
[77] http://dnr.alaska.gov/mlw/planning/
[78] https://www.npfmc.org/upcoming-council-meetings/
[79] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
[80] http://www.adfg.alaska.gov/index.cfm?adfg=access.planning

Community Engagement Outreach Committee https://www.npfmc.org/outreach/ Alaska State Area and Management Plans http://dnr.alaska.gov/mlw/planning/ MPFMC Meeting Schedule https://www.npfmc.org/upcoming-council-meetings/ ADFG BOF Meeting Schedule http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main Alaska State Land Use and Access Planning http://www.adfg.alaska.gov/index.cfm?adfg=access.planning
Non-Conformance Number (if relevant):

2.3 Fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g. aquaculture, tourism, energy) shall be adopted and fishing shall be regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Procedures and mechanisms shall be established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.

FAO CCRF (1995) 7.6.5, 10.1.4, 10.15

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Practices for the avoidance of conflict between fishers and other coastal users have **not** been adopted and fishing gear **is not** regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms **are not** established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users. **Lacking in all parameters.**	Practices have been adopted but are largely **ineffective** to avoid conflict between fishers and other coastal users, and fishing gear **is insufficiently** regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms **are insufficiently** established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users. **Lacking in two parameters.**	Practices have been adopted but are **moderately effective** in avoiding conflict between fishers and other coastal users, and fishing gear **is moderately** regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms **are moderately** established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users. **Lacking in one parameter.**	Fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g. aquaculture, tourism, energy) are adopted and fishing is regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Procedures and mechanisms are established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users. **Fulfils all parameters.**

Evaluation Parameters
Process: These practices have been adopted, and there is a process to regulate fishing gear, methods and vessels so as to avoid risk of conflict If conflict arise, there is process that allows to settle conflicts between fishery users and other users.
Current Status/Appropriateness/Effectiveness: Describe these practices and their effectiveness within the fishery sector, and between fishers and other coastal users.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws and regulations or other documents.

Evaluation (per parameter):

Process
The federal and state management processes provide multiple options for stakeholder engagement and participation in decision making. These processes are considered to minimise conflict and contribute to resolving disputes.

All regulations and management measures are discussed at Council and BOF meetings. The Council and the BOF offer a public forum for stakeholder involvement. Stakeholders are actively encouraged to participate and contribute to existing agenda items or offer up new items for public discussion and management consideration.

Potential conflict between fishermen and other coastal users at the federal level are usually discussed and resolved through the NEPA Process and, at the State level, through the BOF public meeting process or regional committee established as part of the State's land use and access planning processes (see 2.2).

The NPFMC has also established a community engagement outreach committee to better inform coastal residents heavily reliant on subsistence fisheries and other marine resources, on the issues and actions of the Council and how they may get involved.

Current Status/Appropriateness/Effectiveness:
A suite of management measures are in place for the groundfish fisheries, that may contribute to minimizing conflict with other sectors or coastal users, for example, area restrictions are in place, e.g. around Stellar sea lion (SSL) rookeries; coordinated season timing is used to spread out fishing effort over the year thereby helping to minimise gear conflicts, and allow participation by all elements of the groundfish fleet; the flatfish fishery is subject to prohibited species catch (PSC) limits.

Evidence basis:
The FMPs highlight the different management approaches taken in the groundfish fisheries and, in some instances recognize they may reduce gear conflicts, e.g. coordinated season timing. Amendments have been introduced as a direct result of conflicts between different sectors or communities dependent on PSC species such as halibut, e.g. Amendments 111[81]. Amendments are all extensively discussed within the Council before being implemented and reviewed on a regular basis.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NEPA Process https://www.epa.gov/nepa/national-environmental-policy-act-review-process

Community Engagement Outreach Committee https://www.npfmc.org/outreach/

Alaska State Area and Management Plans http://dnr.alaska.gov/mlw/planning/

NPFMC BSAI Groundfish FMP https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC GOA Groundfish FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Amendment 111 to the BSAI Groundfish FMP https://www.fisheries.noaa.gov/action/amendment-111-fmp-groundfish-bering-sea-and-aleutian-islands-management-area

Non-Conformance Number (if relevant):

[81] https://www.fisheries.noaa.gov/action/amendment-111-fmp-groundfish-bering-sea-and-aleutian-islands-management-area

2.4 States and sub-regional or regional fisheries management organizations and arrangements shall give due publicity to conservation and management measures and ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures shall be explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures.

FAO CCRF (1995) 7.1.10

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Dissemination of information does not exist. **Lacking in all parameters.**	There is **insufficiently** effective information dissemination to allow application and in support of implementation of such measures. **Lacking in two parameters.**	There is **moderately** effective information dissemination to allow application and in support of implementation of such measures. **Lacking in one parameter.**	The State and sub-regional or regional fisheries management organizations and arrangements give due publicity to conservation and management measures and ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures are explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for fishery related information to be disseminated.
Current Status/Appropriateness/Effectiveness: There is a record of the disseminated information, and is it disseminated effectively, and the basis and purposes of such regulation explained to users.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include records of such management measures published in the internet or distributed at public meetings.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process
There is a process that allows for fishery related information to be disseminated. Representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and in other activities related to coastal area management planning and development. This happens through the NPFMC and BOF meeting process, NEPA processes and proceedings, as well as through public review processes organised by NMFS. Please refer to previous Clauses (2.1, 1.7, 1.8) for further information and references.

Current Status/Appropriateness/Effectiveness, Evidence basis:
The agencies public meetings provide an opportunity for publicising new regulations and management measures. For stakeholders that may not regularly participate in these public meetings, notice is posted on the NPFMC and BOF websites. For more remote areas, radio updates are provided, e.g. notice of fishery closure. In addition to local radio, printed news releases and Emergency Orders (available at local harbourmaster's offices, marine supply outlets, etc) are also important sources of public information. OLE and AWT enforcement officers ensure as many fishermen and their representatives are informed of any changes in regulations.

Evidence Basis:
The MSA requires Councils to hold public meetings within their respective regions to discuss the development and amendment of FMPs. These meetings are publicised by the NPFMC and stakeholders

actively encouraged to participate changes and allow input from stakeholders.[82]

The BOF website publishes information on forth-coming BOF meetings including the "Proposal Book"[83] which details proposed ADFG or stakeholder requested changes that might lead to regulatory change. Stakeholders are actively encouraged to participate at the meetings and submit proposal prior to the meetings.

The OLE and AWT put an emphasis on outreach efforts and educating and informing stakeholders of new regulatory changes and other important fishery related matters[84].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPFMC process https://www.npfmc.org/how-do-i-get-involved/

ADFG Proposal Book http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook

NOAA Fisheries office of Law Enforcement, Alaska Enforcement Division, report to the International Pacific Halibut Commission https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-ar16.pdf

Non-Conformance Number (if relevant):

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.

FAO CCRF 10.2.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** assessment of socio-economic and cultural value to assist decision making on resource allocation and use. **Lacking in all parameters.**	There is **insufficient** assessment of socio-economic and cultural value to assist decision making on resource allocation and use. **Lacking in two parameters.**	There is **moderate** assessment of socio-economic and cultural value to assist decision making on resource allocation and use. **Lacking in one parameter.**	The economic, social and cultural value of coastal resources is assessed in order to assist decision-making on their allocation and use. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system that allows for socio-economic value assessments and cultural value assessments to be carried out.
Current Status/Appropriateness/Effectiveness: There are socio-economic value assessments and cultural value assessments, both of which are effectively assisting decision making on resource allocation and use.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on social/cultural/economic value of the resource.

Evaluation (per parameter)/: General description of evidence in order to score the clause

[82] https://www.npfmc.org/how-do-i-get-involved/
[83] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook
[84] https://iphc.int/uploads/pdf/am/2018am/iphc-2018-am094-ar16.pdf

Process:
The Community Development Quota (CDQ) Program[85] 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 purpose of the CDQ Program is: (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. The program involves eligible communities who have formed six regional organizations, referred to as CDQ groups. There are 65 communities within a fifty-mile radius of the Bering Sea coastline who participate in the program. The CDQ program allocates a percentage of the BSAI quotas to CDQ groups.

Current Status/Appropriateness/Effectiveness:
The program is reviewed every ten years. The last review of the CDQ program was 2012. Analysis by the State of Alaska in 2013[86], determined that each CDQ entity had maintained or improved performance against its objectives.

Evidence basis:
As indicated above the CDQ program provides an example of how the management system takes account of the allocation and use of coastal resources with respect to their economic, social and cultural value.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Community Development Quota (CDQ) Program https://alaskafisheries.noaa.gov/fisheries/cdq

State of Alaska review of the CDQ Program
https://www.commerce.alaska.gov/web/dbs/cdqinformation.aspx

Non-Conformance Number (if relevant):

2.6 States shall cooperate at the sub-regional level in order to improve coastal area management, and in accordance with capacities, measures shall be taken to establish or promote systems for research and monitoring of the coastal environment, in order to improve coastal area management, and promote multidisciplinary research in support and improvement of coastal area management using physical, chemical, biological, economic, social, legal and institutional aspects.

FAO CCRF (1995) 10.2.4, 10.2.5, 10.3.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems to	There is **insufficient** cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems	There is **moderate** cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems	There is cooperation at the sub-regional level in order to improve coastal area management, and in accordance with capacities, measures are taken to establish or

[85] https://alaskafisheries.noaa.gov/fisheries/cdq
[86] https://www.commerce.alaska.gov/web/dbs/cdqinformation.aspx

monitor coastal environment using multidisciplinary research. **Lacking in all parameters.**	to monitor coastal environment using multidisciplinary research. **Lacking in two parameters.**	to monitor coastal environment using multidisciplinary research. **Lacking in one parameter.**	promote systems for research and monitoring of the coastal environment, in order to improve coastal area management, and promote multidisciplinary research in support and improvement of coastal area management using physical, chemical, biological, economic, social, legal and institutional aspects. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system at the sub regional level that allows research and monitoring of the coastal environment and multidisciplinary research in support of coastal area management is promoted.
Current Status/Appropriateness/Effectiveness: Systems of monitoring and research have taken into account physical, chemical, biological, economic, social, legal, and institutional aspects to support coastal area management.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on the status of the coastal area using the various aspects listed above.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process:
A considerable amount of monitoring of the coastal environment in Alaska is performed and supported by multiple federal and state agencies, e.g. NMFS, AFSC, ADFG, institutions of higher learning, e.g. the University of Alaska Fairbanks Institute of Marine Science[87] and organisations that support and facilitate marine research, e.g. North Pacific Research Board[88]

Current Status/Appropriateness/Effectiveness:
The NOAA Fisheries Strategic Plan[89] calls for predictive models of the consequences of climate change on ecosystems through monitoring changes in coastal and marine ecosystems, conducting research on climate-ecosystem linkages, and incorporating climate information into physical-biological models. As a result, AFSC has established the Ecosystem Monitoring and Assessment Program[90] (EMA), with an overall goal to improve and reduce uncertainty in stock assessment models of commercially important fish species through the collection of observations of fish and oceanography. These fish and oceanographic observations are used to connect climate change and variability in large marine ecosystems to early marine survival of commercially important fish species in the GOA, EBS, AI and Arctic. The goal for this assessment is to develop models relating these fisheries-oceanographic indices to productivity of commercially important fish species (such as Pacific cod, pollock, herring, flatfish and western Alaska salmon) in the southeastern Bering Sea. The program is supported through partnerships in regional research programs such as the North Pacific Research Board, North Pacific Anadromous Fish Commission's Bering Aleutian Salmon International Survey (BASIS), the Bering Sea Fisherman's Association, the Alaska Sustainable Salmon Fund, and the Arctic Yukon Kuskokwim Sustainable Salmon Fund and the Alaska Ocean Observation System.

NMFS, Alaska Region, Fisheries' Habitat Conservation Division[91] (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on Essential Fish Habitat (EFH) and living marine resources in Alaska. This work includes conducting and/or reviewing environmental analyses for a large variety of activities ranging from commercial fishing to coastal development to large transportation and energy projects. HCD identifies technically and economically feasible alternatives and offers realistic

[87] http://www.uaf.edu/cfos/research/institute-of-marine-scien/
[88] http://www.nprb.org
[89] https://www.fisheries.noaa.gov/resource/document/noaa-fisheries-priorities-and-annual-guidance-2018
[90] https://www.afsc.noaa.gov/ABL/EMA/EMA_default.php
[91] https://alaskafisheries.noaa.gov/habitat

recommendations for the conservation of valuable living marine resources. HCD focuses on activities in habitats used by federally managed fish species located offshore, nearshore, in estuaries, and in freshwater areas important to anadromous salmon.

NOAAs Pacific Marine Environmental Laboratory[92] (PMEL) undertakes marine ecosystem research focusing on measuring, understanding, and predicting impacts of natural physical, chemical, biological, geological, and anthropogenic processes on the oceanic web of life. A sub-set of their work known as "Oceans and Coastal Processes Research" includes an understanding of ocean physics and interactions between the ocean, the seafloor and atmosphere.

The North Pacific Research Board (NPRB) was established in 2001. The Board is authorized to recommend marine research to the Secretary of Commerce to be funded through a competitive grant program using part of the interest earned from the Environmental Improvement and Restoration Fund (EIRF) The EIRF was part of a large settlement by the U.S. Supreme Court pertaining to a land dispute in the Arctic known as Dinkum Sands. The enabling legislation requires the funds to be used to conduct research on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean.

As a result the NPRB have helped fund two major projects in the Alaska region: The Bering Sea Project[93], is a partnership between the NPRB and the National Science Foundation[94], which seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than 50 scientists from 11 institutions are taking part in the $17.6 million.

The Gulf of Alaska Ecosystem Study, examines the physical and biological mechanisms that determine the survival of juvenile groundfish in the Gulf of Alaska. Field work was conducted through 2010-14 and a synthesis is underway producing products that apply the results to fisheries management.

The University of Alaska Fairbanks, Institute of Marine Science (IMS) conducts research within the Alaska region through a range of fisheries and ocean science disciplines[95], including marine, estuarine and freshwater ecosystems and their related human dimensions.

Evidence Basis:
The results, or, progress of on-going research identified for each of the government bodies or research and academic institutes above can be found at the website links provided.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

University of Alaska Fairbanks Institute of Marine Science http://www.uaf.edu/cfos/research/institute-of-marine-scien/

North Pacific Research Board http://www.nprb.org

NOAA Fisheries Priorities and Annual Guidance for 2018

https://www.fisheries.noaa.gov/resource/document/noaa-fisheries-priorities-and-annual-guidance-2018

Ecosystem Monitoring and Assessment Program https://www.afsc.noaa.gov/ABL/EMA/EMA_default.php

Alaska Region, Fisheries' Habitat Conservation Division https://alaskafisheries.noaa.gov/habitat

NOAAs Pacific Marine Environmental Laboratory (PMEL) https://www.pmel.noaa.gov

North Pacific Research Board - The Bering Sea Project. http://www.nprb.org/bering-sea-project/about-

[92] https://www.pmel.noaa.gov
[93] http://www.nprb.org/bering-sea-project/about-the-project/
[94] https://www.nsf.gov
[95] http://www.uaf.edu/cfos/research/institute-of-marine-scien/reasearch-projects/

the-project/ National Science Foundation https://www.nsf.gov The University of Alaska Fairbanks, Institute of Marine Science (IMS) http://www.uaf.edu/cfos/research/institute-of-marine-scien/reasearch-projects/
Non-Conformance Number (if relevant):

Not Applicable – artificial reefs and fish aggregation devices are not used in the Alaska flatfish fisheries.

2.7 States shall, within the framework of coastal area management plan, establish management systems for artificial reefs and fish aggregation devices. Such management systems shall require approval for the construction and deployment of such reefs and devices and shall take into account the interests of fishers, including artisanal and subsistence fishers.

FAO CCRF (1995) 8.11.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** management plans for artificial reefs or fish aggregation devices integrated within the framework of coastal area management plans taking into account the interest of fishers, including artisanal and subsistence fishers, and requiring approval for the construction and deployment of such reefs and devices.	There are **insufficiently** effective management plans for artificial reefs or fish aggregation devices integrated within the framework of coastal area management plans taking into account the interest of fishers, including artisanal and subsistence fishers and requiring approval for the construction and deployment of such reefs and devices.	There are **moderately** effective management plans for artificial reefs or fish aggregation devices integrated within the framework of coastal area management plans taking into account the interest of fishers, including artisanal and subsistence fishers and requiring approval for the construction and deployment of such reefs and devices.	The state, within the framework of coastal area management plan, has established management systems for artificial reefs and fish aggregation devices. Such management systems require approval for the construction and deployment of such reefs and devices and take into account the interests of fishers, including artisanal and subsistence fishers.
Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	**Fulfils all parameters.**

Evaluation Parameters

Note: The use of artificial structures may be appropriate for some stocks but not necessary for all. This clause may therefore not be applicable if such structures are not practical or appropriate for stocks. The use of artificial structures should be considered appropriate if one or more of the species under assessment has benefitted from the use of artificial structures in other fisheries, or if species with similar biological characteristics have benefitted from the use of artificial structures in other fisheries.

Process: There is a mechanism in place for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. Management plans for artificial reefs or fish aggregation devices integrated within the framework of coastal area management plans take into account the interest of fishers.

Current Status/Appropriateness/Effectiveness: Management plans for artificial reefs or fish aggregation devices have been effectively integrated within the framework of coastal area management plans, and these plans effectively take into account the interest of fishers, including artisanal and subsistence fishers.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, plans, data and reports.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐
References:				
Non-Conformance Number (if relevant):				

2.8 In the case of activities that may have an adverse transboundary environmental effect on coastal areas, States shall:
a) Provide timely information and if possible, prior notification to potentially affected States.
b) Consult with those States as early as possible.

FAO CCRF (1995) 10.3.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** provision of timely information or prior notification. **Lacking in all parameters.**	There is **insufficient** provision of timely information or prior notification. **Lacking in two parameters.**	There is **moderate** provision of timely information or prior notification. **Lacking in one parameter.**	In the case of activities that may have an adverse transboundary environmental effect on coastal areas, the state provides timely information and if possible, prior notification to potentially affected States. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system to allow early information sharing with affected neighboring countries in case of transboundary environmental effects that may affect them.
Current Status/Appropriateness/Effectiveness: There are current agreements for or past records of such occurrences. Examples may include oil spills, and aquaculture farms escapes among others.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports or data on the international cooperation in these events.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process
The risk of oil pollution[96] is an example of potential transboundary environmental effects on the coastal area. Coordination and development of memoranda of cooperation and a Pacific States / British Columbia Oil Spill Task Force[97] to deal with oil and other pollution incidents are examples of facilitating pollution preparedness, prevention and response.

Current Status/Appropriateness/Effectiveness:
The State of Alaska is represented in the Oil Spill Task Force by the Department of Environmental Conservation. Its Division of Spill Prevention and Response[98] (SPAR) prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. Given their experience with the Exxon Valdez oil tanker disaster in 1989, Alaskans have made significant progress in the safe handling, storage, and transportation of oil and chemicals and the cleanup of historical contamination.

[96] https://www.fisheries.noaa.gov/alaska/habitat-conservation/analyzing-risk-improve-oil-spill-planning-and-response
[97] http://oilspilltaskforce.org
[98] https://dec.alaska.gov/spar/

Evidence basis:
Pacific States / British Columbia Oil Spill Task Force produce annual reports[99] which include, prevention, preparedness, response and communication updates as well as jurisdictional reviews of the US member states and British Columbia.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Analaysing risk to improve oil spill planning and response
https://www.fisheries.noaa.gov/alaska/habitat-conservation/analyzing-risk-improve-oil-spill-planning-and-response

Pacific States / British Columbia Oil Spill Task Force http://oilspilltaskforce.org

Pacific States / British Columbia Oil Spill Task Force produce annual reports
http://oilspilltaskforce.org/documents/annual-reports/

State of Alaska, Oil Spill Task Force https://dec.alaska.gov/spar/

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.3.3/7.2.2
FAO ECO (2009) 28.1, 28.2
FAO ECO (2011) 35.1, 35.2

3.1 Long term management objectives shall be translated into a plan or other management document (taking into account uncertainty and imprecision) and be subscribed to by all interested parties.

FAO CCRF (1995) 7.3.3
FAO ECO (2009) 28.1
FAO ECO (2011) 35.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** long term management objectives translated into a plan or other management document. **Lacking in all parameters.**	There are **insufficiently** clear long term management objectives translated into a plan or other management document that take into account best available scientific evidence and are consistent with the sustainable use of the resource, and subscribed to by important fishery	There are **moderately** clear long term management objectives translated into a plan or other management document that take into account best available scientific evidence and are consistent with the sustainable use of the resource, and subscribed to by	Scientifically based long term management objectives consistent with the sustainable use of the resource are translated into a plan or other management document which is subscribed to by all interested parties. **Fulfils all parameters.**

[99] http://oilspilltaskforce.org/documents/annual-reports/

	stakeholders. **Lacking in two parameters.**	important fishery stakeholders. **Lacking in one parameter.**	

Evaluation Parameters
Process: Management objectives based on the best available scientific evidence (which can include traditional knowledge, if verifiable) have been translated into a fishery management plan or similar document.
Current Status/Appropriateness/Effectiveness: The objectives described by the management plan are consistent with the sustainable use of the resource, and are subscribed to by all relevant fishery stakeholders.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plan/framework or legal rules.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process / Evidence Basis:
Under the MSA, the NPFMC is required to prepare and submit a FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs have to be consistent with ten national standards for fishery conservation and management (16 USC § 1851)[100].

Current Status/Appropriateness/Effectiveness
The NPFMC has in place groundfish FMPs in the BSAI and GoA that include the flatfish fisheries. Within these FMPs there are nine management and policy objectives, that are reviewed annually. These objectives are:

1. Prevent Overfishing:
   - Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.
   - Continue to use the 2 million t optimum yield cap for the BSAI groundfish fisheries.
   - Provide for adaptive management by continuing to specify optimum yield as a range.
   - Provide for periodic reviews of the adequacy of F_{40}% and adopt improvements, as appropriate.
   - Continue to improve the management of species through species categories.

2. Promote Sustainable Fisheries and Communities:
   - Promote conservation while providing for optimum yield in terms of the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence, and commercial fishing participants and fishing communities.
   - Promote management measures that, while meeting conservation objectives are also designed to avoid significant disruption of existing social and economic structures.
   - Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.
   - Promote increased safety at sea.

3. Preserve Food Web:
   - Develop indices of ecosystem health as targets for management.
   - Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.
   - Continue to protect the integrity of the food web through limits on harvest of forage species.
   - Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.
4. Manage Incidental Catch and Reduce Bycatch and Waste:
   - Continue and improve current incidental catch and bycatch management program.
   - Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
   - Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.

[100] https://www.law.cornell.edu/uscode/text/16/1851

- Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
- Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.
- Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species.
- Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.
- Reduce waste to biologically and socially acceptable levels.

5. Avoid Impacts to Seabirds and Marine Mammals:
   - Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.
   - Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.
   - Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
   - Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

6. Reduce and Avoid Impacts to Habitat:
   - Review and evaluate efficacy of existing habitat protection measures for managed species.
   - Identify and designate essential fish habitat and habitat areas of particular concern pursuant to MSA rules, and mitigate fishery impacts as necessary and practicable to continue the sustainability of managed species.
   - Develop a Marine Protected Area (MPA) policy in coordination with national and state policies.
   - Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.
   - Develop goals, objectives and criteria to evaluate the efficacy and suitable design of MPAs and no-take marine reserves as tools to maintain abundance, diversity, and productivity.
   - Implement marine protected areas if and where appropriate.

7. Promote Equitable and Efficient Use of Fishery Resources:
   - Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
   - Maintain the license limitation program, modified as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licenses and extending programs such as community or rights-based management to some or all groundfish fisheries.
   - Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.
   - Develop management measures that, when practicable, consider the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities.

8. Increase Alaska Native Consultation:
   - Continue to incorporate local and traditional knowledge in fishery management.
   - Consider ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
   - Increase Alaska Native participation and consultation in fishery management.

9. Improve Data Quality, Monitoring and Enforcement:
   - Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
   - Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.
   - Improve community and regional economic impact costs and benefits through increased data reporting requirements.
   - Increase the quality of monitoring and enforcement data through improved technology. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and

compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.
- Cooperate with research institutions such as the North Pacific Research Board in identifying research needs to address pressing fishery issues.
- Promote enhanced enforceability.
- Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Alaska Department of Fish and Game, and Alaska Fish and Wildlife Protection, the U.S. Coast Guard, NMFS Enforcement, International Pacific Halibut Commission, Federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

Flatfish fisheries in state waters are managed concurrent to the federal BSAI or GOA fishery, and are referred to as "parallel fisheries". Parallel fisheries are managed by adopting NMFS rules and management actions, including seasons, and catch is counted towards federal quotas. Therefore, these fisheries are considered to operate under the federal management objectives.

Evidence basis:
In combination, the requirement for the NPFMC FMPs with the national standards, and, the adoption of their management and policy objectives, the federally managed Alaska flatfish fisheries clearly have long-term management objectives that are consistent with the sustainable use of the resource, and are subscribed to by all relevant fishery stakeholders.

Conclusion:

Evidence Rating:	Low ☐	Medium ☑		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☑	None ☑

References:

Magnuson Stevens Act US Code – Title 16: Conservation – National Standard for Fishery Conservation and Management https://www.law.cornell.edu/uscode/text/16/1851

Non-Conformance Number (if relevant):

3.2 Management measures shall provide, inter alia, that:
3.2.1 Excess fishing capacity shall be avoided and exploitation of the stocks remains economically viable.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** avoidance of excess fishing capacity. **Lacking in all parameters.**	There is **insufficient** avoidance of excess fishing capacity. **Lacking in two parameters.**	There is **moderate** avoidance of excess fishing capacity. **Lacking in one parameter.**	Excess fishing capacity is avoided and exploitation of the stocks remains economically viable. **Fulfils all parameters.**

Evaluation Parameters
Process: There are management measures in place to limit and/or reduce the total fishing capacity of the Unit of Certification. This shall include the existence of specific fishing capacity objective(s), which themselves are based on the best available scientific understanding of the level of fishing pressure appropriate to ensure the long-term sustainability of the fishery.
Current Status/Appropriateness/Effectiveness: The fishing capacity of the Unit of Certification is

at or below the level of the specific fishing capacity objective(s).
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery reports on harvest recommendation and harvest or fleet reports.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process
In 1995, the NPFMC adopted the Alaska Licence Limitation Program[101] (LLP). The intent of the program has been to use fishing track record to rationalise the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licences.

As of, 2000 a Federal LLP licence is required for vessels participating in directed fishing for LLP groundfish species in the BSAI, GOA or fishing in any BSAI LLP crab fisheries. A vessel must be named on an original LLP license that is onboard the vessel. The LLP license requirement is in addition to all other permits or licences required by federal regulations. The LLP is a Federal program and LLP licences are not required for participation in fisheries that occur in the waters of the State of Alaska.

The Restricted Access Management (RAM) Program has prepared lists of LLP groundfish and crab licenses. LLP licenses are initially issued to persons, based on the activities of original qualifying vessels.

There are four exceptions to the LLP license requirement:

1. Vessels that do not exceed 26 feet in Length Overall (LOA) in the GOA;
2. Vessels that do not exceed 32 feet LOA in the BSAI;
3. Vessels that do not exceed 60 feet LOA and that are using jig gear (but no more than 5 jig machines, one line per machine, and 15 hooks per line) are exempt from the LLP requirements in the BSAI; and,
4. Certain vessels constructed for, and used exclusively in, Community Development Quota fisheries.

The Amendment 80 program, implemented in 2008, allocates several BSAI non-pollock trawl groundfish species among trawl fishery sectors and facilitates the formation of harvesting cooperatives in the non-American Fisheries Act (AFA) trawl catcher processor sector (the pollock fleet). The Amendment 80 program was designed to meet the broad goals of: (1) improving retention and utilization of fishery resources by the non-AFA trawl catcher processor fleet; (2) allocating fishery resources among BSAI trawl harvesters in consideration of historic and present harvest patterns and future harvest needs; (3) establishing a limited access privilege program[102] (LAPP) for the non-AFA trawl catcher processors and authorizing the allocation of groundfish species to harvesting cooperatives to encourage fishing practices with lower discard rates and to improve the opportunity for increasing the value of harvest species while lowering costs; and (4) limiting the ability of non-AFA trawl catcher processors to expand their harvest capacity into other fisheries not managed under a limited access privilege program.

This latter goal has been achieved in the GOA by sector wide harvest limits, commonly known as "sideboards", that limit the catch of pollock, Pacific cod, northern rockfish, Pacific ocean perch, and pelagic shelf rockfish, as well as halibut PSC based on harvest patterns during 1998 through 2004. Halibut PSC sideboard limits were designed to limit effort by GOA flatfish qualified Amendment 80 vessels in the GOA flatfish fisheries.

Current Status/Appropriateness/Effectiveness:
Groundfish licenses are currently required to participate in the BSAI groundfish fisheries in Federal waters. Groundfish licenses contain endorsements that define what the vessel using the license is allowed to do. An area endorsement defines the geographic location the license allows a vessel to fish. Under the groundfish LLP, separate BS and AI area endorsements were earned and issued based on historic fishing patterns. Licenses may contain endorsements for both areas (BS and AI), or one of the two areas. Gear endorsements define what type of gear may be used: non-trawl, trawl, or both.

The Gulf of Alaska groundfish fisheries are among the few remaining limited access (not rationalised) fisheries in Alaska, however, as indicated above the harvesting capacity is limited by the bycatch of other named species.

[101] https://alaskafisheries.noaa.gov/fisheries/llp
[102] https://www.fisheries.noaa.gov/resource/document/design-and-use-limited-access-privilege-programs

Evidence Basis:
The NPFMC website includes a page[103] describing the development and evolution of the Amendment 80 groundfish trawl fishery and a management page dedicated to the Amendment 80 program[104].

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Alaska Licence Limitation Program (LLP) https://alaskafisheries.noaa.gov/fisheries/llp

Limited Access Privilege Program (LAPP) https://www.fisheries.noaa.gov/resource/document/design-and-use-limited-access-privilege-programs

Amendment 80 groundfish trawl fishery https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/bering-sea-and-aleutian-islands-amendment-80-groundfish-trawl-fishery

Non-Conformance Number (if relevant):

3.2.2 The economic conditions under which fishing industries operate shall promote responsible fisheries.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is an **absence** of favorable economic conditions that promote responsible fishing. **Lacking in all parameters.**	There is an **insufficient** presence of favorable economic conditions that promote responsible fishing. **Lacking in two parameters.**	There is a **moderate** presence of favorable economic conditions that promote responsible fishing. **Lacking in one parameter.**	The economic conditions under which fishing industries operate promote responsible fisheries. **Fulfils all parameters.**

Evaluation Parameters
Process: Where best available scientific evidence determines that it is necessary, there are management measures in place to ensure the economic conditions under which the fishery operates promote responsible fisheries.
Current Status/Appropriateness/Effectiveness: There is evidence for the general economic value of the resource and its benefit to fishermen. There is enforcement data that supports the occurrence of responsible fishing practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include economic reports or enforcement data.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process
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 precautionary approach (OFL, ABC, TAC, OY) to manage the federal groundfish fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem

[103] https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/bering-sea-and-aleutian-islands-amendment-80-groundfish-trawl-fishery
[104] https://www.fisheries.noaa.gov/tags/amendment-80-program-alaska

considerations (e.g. the OY limits). The fisheries management system is supported by strong science and the biomass of all flatfish stocks has been maintained well above the limit reference points, and thus management measures are effective in avoiding overfishing and maintain an abundance of fish that make fishing economically viable and help promote responsible fishing. Objectives for the BSAI and GOA are set out in the FMPs and include the need to consider socio-economic considerations.

Current Status/Appropriateness/Effectiveness and Evidence Basis:
Enforcement reports indicate high compliance in the flatfish fisheries (see Clause 10).

Estimates of ex-vessel value by area, gear, type of vessel, and species, are included in the annual Economic Status appendix to the SAFE reports[105]. With respect to flatfish species, the values are broken down by species or "other flatfish" in the BSAI, in the GOA they are broken down by the main species and flatfish complexes (shallow and deep):

BSAI	Retained catch	Ex vessel value ($ million)
Yellowfin	128,600	50.1
Rock sole	33,900	14.51
Flathead sole	8,100	3.95
Arrowtooth	5,600	3.87
Kamchatka	4,200	3.41
Turbot	2,700	2.77
Other flatfish (includes Alaska plaice	2,900	Not available
GOA		
Arrowtooth	24,900	5.95
Flathead	1,900	0.57
Rex sole	1,200	0.63
Shallow flatfish	2,000	0.72
Deep flatfish	100	0.02

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Annual Economic Status appendix to the SAFE reports
https://www.fisheries.noaa.gov/resource/data/2017-economic-status-groundfish-fisheries-alaska

Non-Conformance Number (if relevant):

3.2.3 The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries shall be taken into account.

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is **no** accounting of interests of fishers including those engaged in subsistence, small-scale and artisanal	There is **insufficient** accounting of interests of fishers including those engaged in subsistence, small-	There is **moderate** accounting of interests of fishers including those engaged in subsistence, small-	The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries are taken into

[105] https://www.fisheries.noaa.gov/resource/data/2017-economic-status-groundfish-fisheries-alaska

fisheries. **Lacking in all parameters.**	scale and artisanal fisheries. **Lacking in two parameters.**	scale and artisanal fisheries. **Lacking in one parameter.**	account. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system or process in place that identifies the interests of small scale fishers, either through stakeholder engagement or social research, in a way which permits the utilization of the information during the management measure development process.
Current Status/Appropriateness/Effectiveness: There is evidence that the interest of small scale fishers are effectively taken into account during the development of management measures, and there is no evidence that small-scale fisheries are severely adversely impacted by any management measures currently in place.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include dedicated quotas, public meeting records, laws and regulations.

Evaluation (per parameter)/: General description of evidence in order to score the clause

Process
The interest of subsistence, small-scale and artisanal fisheries are explicitly taken into account within the FMPs and, with respect to the BSAI and GoA flatfish fisheries, action has been taken to minimise the bycatch of species, in particular, halibut, as a direct consequence of its importance for subsistence and artisanal fisheries (see clause 2.3 above).

Current Status/Appropriateness/Effectiveness:
The GOA and BSAI FMPs describe management measures designed to consider the interests of subsistence, small-scale, and artisanal fisheries. Specific FMP management objectives and sub-objectives include: the promotion of sustainable fisheries and communities, the promotion of equitable and efficient use of fishery resources and increase Alaska native consultation.

The fishery dependence of coastal and western Alaska communities was addressed through the creation of the pollock, sablefish, and halibut community development quota (CDQ) programs for the BSAI in the early to mid-1990s and the expansion of those programs into the multispecies CDQ Program with the addition of all other groundfish species by 1999. The CDQ Program has provided the following for the CDQ communities: 1) additional employment in the harvesting and processing sectors of the groundfish fisheries; 2) training; and 3) income generated by fishing the CDQ allocations. In many cases, CDQ royalties have been used to increase the ability of the residents of the CDQ communities to participate in the regional commercial fisheries, or the CDQ has been fished by residents themselves.

In addition to this, the Council takes into account the interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries, during management of the flatfish fisheries in the BSAI and the GOA, e.g. by using Prohibited Species Catch (PSC) limits.

Evidence basis:
The FMPs provide information on subsistence fisheries in the BSAI and GOA and how they are taken into account within the management process.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NPFMC BSAI Groundfish FMP https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC GOA Groundfish FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Community Development Quota (CDQ) Program https://www.fisheries.noaa.gov/alaska/commercial-

fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska
Non-Conformance Number (if relevant):

3.2.4 Biodiversity of aquatic habitats and ecosystems shall be conserved and endangered species shall be protected. Where relevant, there shall be pertinent objectives, and as necessary, management measures.			
Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** conservation of aquatic habitats and ecosystems' biodiversity and endangered species protection, and where relevant, pertinent objectives, and as necessary, management measures. **Lacking in all parameters.**	There is **insufficient** conservation of aquatic habitats and ecosystems' biodiversity and endangered species protection, and where relevant, pertinent objectives, and as necessary, management measures. **Lacking in two parameters.**	There is **moderate** conservation of aquatic habitats and ecosystems' biodiversity and endangered species protection, and where relevant, pertinent objectives, and as necessary, management measures. **Lacking in one parameter.**	Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected. Where relevant, there are pertinent objectives, and as necessary, management measures. **Fulfils all parameters.**

Evaluation Parameters
Process: There are management measures in place specifically designed to ensure that the biodiversity of aquatic habitats and ecosystems are conserved, and endangered species are protected. This shall reflect the existence of specific management objectives and measures which are based on the best available scientific evidence.
Current Status/Appropriateness/Effectiveness: The management measures currently in place have been successful in meeting the management objectives. There is no evidence that the fishery is currently having a significant adverse impact on aquatic habitats or ecosystems, and it is not putting any ETP species at risk of extinction.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws and regulations, fisheries management plans and species status reports.

Evaluation:

Process:
There is a process in place for the development of management objectives to ensure that endangered species are protected from adverse impacts from interactions with the unit of certification are set out in Clause 12.12 below. Measures to preserve the biodiversity of ecosystems (notably Habitat Areas of Particular Concern) are considered under Clauses 3.2.5, 12.9, and 12.13.

The processes in place address the designation of species and the development of objectives and measures under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) for various species (e.g., salmon, Steller sea lions). Section 3.6.5 sets out the basis of the observer program and the levels of precision available. This program forms the basis of data collection directly relevant to these fisheries under assessment and provides comprehensive and high-quality data commensurate to the scale and intensity of the fleet component (noting that observer coverage varies between catcher processor and catcher vessels, gear type, and federal and state fisheries). The observer program is ongoing and provides ongoing updated data on all major aspects of the fisheries, including interactions with endangered and prohibited species.

The ESA was established in 1973 and carries out the provisions in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The ESA aims to conserve endangered and threatened fish, wildlife, and plant species and is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's NMFS. With regard to fishing activities, the USFWS allows a certain level of "incidental take" (IT) of a listed species in cases where "an

action may adversely affect a species but not jeopardize its continued existence" (USFWS 2017).

CITES is a multilateral treaty established to protect endangered plants and animals. It was drafted at a meeting of members of the International Union for Conservation of Nature (IUCN) and became effective in 1975. It aims to ensure that the international trade of wild animals and plants does not threaten the survival of these species, and it extends varying degrees of protection to more than 35,000 animal and plant species. Each CITES-protected species is assigned an appendix, which specifics the extent of the threat and the trade controls applied to that species. CITES Appendix I, the highest level, includes the species that are threatened with extinction and are, or may be, affected by trade.

The MMPA was enacted in 1972 in response to increasing concerns that human activity was causing significant declines in some marine mammal populations. All marine mammals in U.S. waters are protected by the MMPA, which is implemented by NMFS, USFWS, and the Marine Mammal Commission. NMFS performs various conservation and management actions, including:

- Development and implementation of conservation plans for depleted species
- Development and implementation of take-reduction plans to minimize commercial fishing bycatch
- Coordination of the Marine Mammal Health and Stranding Response Program and investigation of unusual mortality events
- Collaboration with other nations to ensure that international trade does not threaten marine mammals
- Investigation and prosecution of MMPA violations

Specific monitoring of endangered species is carried out throughout the EBS, AI, and GOA as appropriate. Marine mammals are monitored according to requirements within the MMPA. Interactions between marine mammals and commercial fisheries are addressed in stock assessments with regional scientific review groups to advise and report on the status of marine mammal stocks within Alaskan waters. These assessments include descriptions of the stock's geographic range, minimum population estimates, current population trends, current and maximum net productivity rates, optimum sustainable population levels, allowable removal levels, and estimates of annual human-caused mortality and serious injury through interactions with commercial fisheries (and subsistence hunters). These data are used to evaluate the progress of each fishery toward achieving the MMPA's goal of zero fishery-related mortality and serious injury of marine mammals. Surveys including aerial counts of adults and pups and satellite tagging studies are done regularly.

Additionally, the USFWS compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process). Salmon are monitored through assessments carried out by relevant departments of Fish and Game (notably the Alaska Department of Fish and Game).

Current Status/Appropriateness/Effectiveness:
The effectiveness of management objectives and accompanying measures in the groundfish fisheries is considered appropriate and effective in ensuring that endangered species are protected from adverse impacts resulting from interactions with the unit of certification.

Objectives set out in the BSAI and GOA FMPs are:

- Continue to cooperate with USFWS to protect ESA-listed species, and if appropriate and practicable, other seabird species.
- Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions (*Eumetopias jubatus*).
- Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
- Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries (LOF) according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤1% of the marine mammal's potential biological removal (PBR) level and total fishery-related mortality <10% of PBR. Any fishery in Category III is considered to have achieved the target level of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that is >1% but is <50% of the stock's PBR level, if total

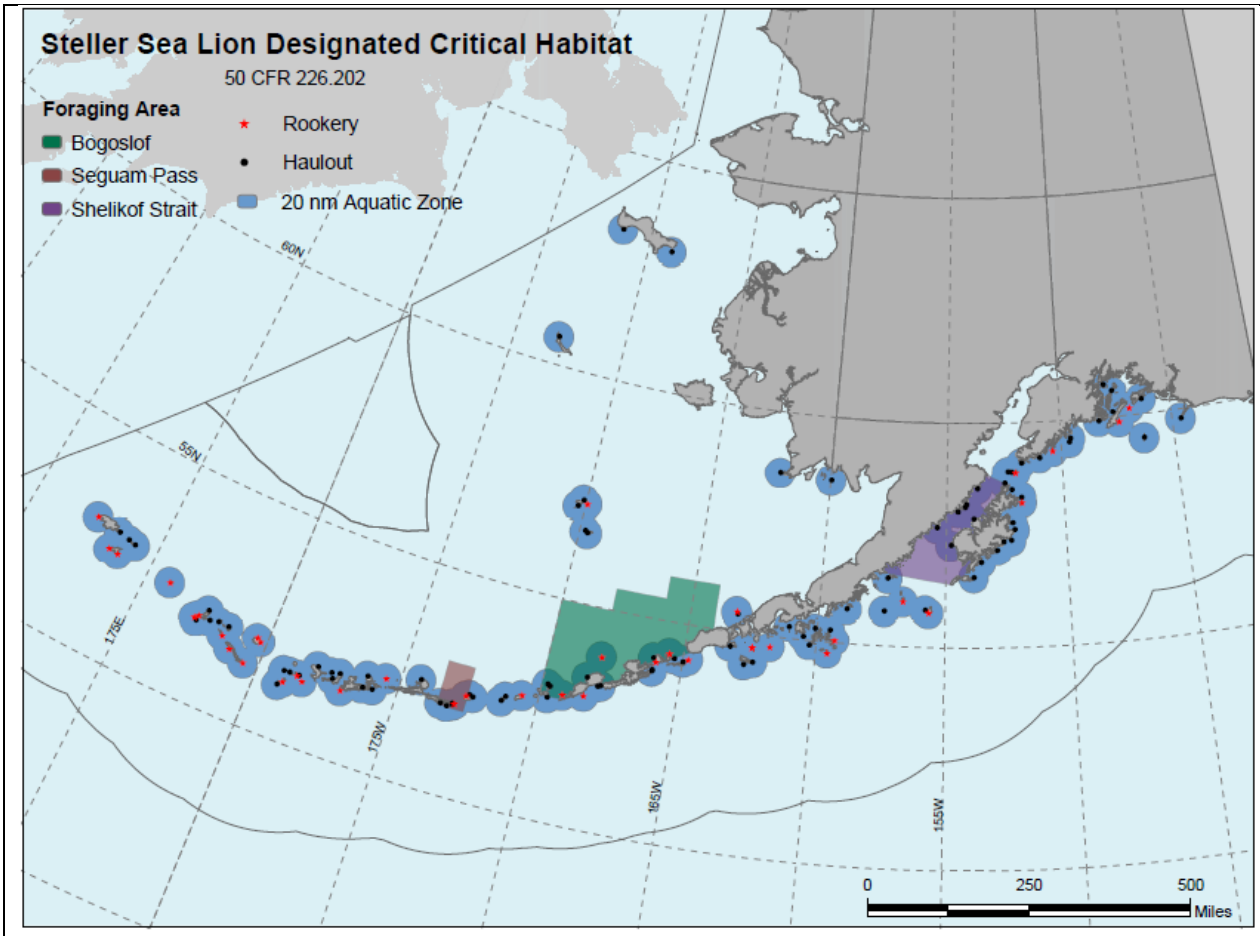
fishery related mortality is ≥10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥50% of PRB. The BSAI flatfish trawl fishery is a Category II; the GOA flatfish trawl and BSAI Greenland turbot longline fisheries are Category III. Observer program data provide annual estimates of takes of endangered species – fish, seabirds, and marine mammals in the BSAI and GOA flatfish fisheries.

BSAI flatfish trawl fishery: The following species are listed on the LOF as relevant to this fishery:

- Bearded seal (Alaska)
- Gray whale (eastern North Pacific)
- Harbor porpoise (Bering Sea)
- Harbor seal (Bering Sea)
- Humpback whale (western North Pacific)
- Killer whale (Alaska resident)
- Killer whale (GOA, AI, and BS transient)
- Northern fur seal (eastern Pacific)
- Ribbon seal (Alaska)
- Ringed seal (Alaska)
- Spotted seal (Alaska)
- Steller sea lion (western US)
- Walrus (Alaska)

Marine mammals are rarely taken incidentally in the BSAI flatfish trawl fishery. Of these species, four are also ESA-listed species: bearded seal and ringed seal are both threatened, and humpback whale and Steller sea lion are both endangered. The gray whale and humpback whale are also listed in CITES Appendix I. From the species listed above, only 1 bearded seal, 2 northern fur seals, 1 ringed seal, 1 spotted seal, and 3 Steller sea lions were seriously injured or killed by the BSAI flatfish fishery in 2015 (the most recent year for data). All of these catch numbers are significantly less than the species' PBRs. Additionally, certain mitigation measures are in place to limit interactions (e.g., closed areas for Steller sea lion breeding).

Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. For marine mammals whose foraging and prey preferences overlap with the fishery, fishery removals could potentially adversely affect the amount or distribution of prey. Accordingly, habitat essential to endangered species is identified according to regulatory requirements (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated critical habitat for Steller sea lions in the Aleutian Islands and Gulf of Alaska included 3 nm no-entry zones around rookeries and haulouts, prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.



The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries. This fishery catches northern fulmars, gulls, kittiwakes, Laysan albatross, and shearwaters, most of which are not endangered, threatened, or protected. Additionally, the catch numbers of these species in this fishery are minimal.

Three ESA-threatened salmon stocks that migrate to Alaskan waters include Lower Columbia River Chinook salmon, upper Willamette River Chinook salmon, and Lower Columbia River Chinook, spring. About 90% of the Chinook salmon bycatch is taken in the pollock fishery and available data indicate that salmon bycatch in the BSAI flatfish fishery does not pose a threat to ESA-listed salmon populations in the Pacific Northwest.

<u>GOA flatfish trawl fishery:</u>
The following species are listed on the LOF as relevant to this fishery:

- Harbor seal (Alaska)
- Northern elephant seal (North Pacific)
- Steller sea lion (western US)

Marine mammals are rarely taken incidentally in the GOA flatfish trawl fishery. The northern elephant seal is the only LOF-listed species caught by the fishery, and according to catch data, none were caught in 2015 (the most recent year for data). The Steller sea lion is not listed on the LOF for the GOA but is an ESA-listed species, and according to catch data, the fishery did catch one in 2015. None of these species is listed in CITES Appendix 1. These catch numbers are significantly less than the species' PBRs. A number of management actions were implemented by NMFS and NPFMC to promote the recovery of Steller sea lions, including the restriction of trawling within areas of critical habitat (see figure above). Recent surveys indicate that in the GOA pup and non-pup numbers have increased, showing positive population trends.

For seabirds, this fishery catches northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the BSAI flatfish fishery, the GOA flatfish fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

BSAI Greenland turbot longline fishery:
The killer whale (Alaska resident) is the only species listed on the LOF as relevant to this fishery. While the killer whale is protected by the MMPA, it is not listed on the ESA or CITES Appendix I. Marine mammals are rarely taken incidentally in this fishery. According to the most recent data (2015), the fishery caught one killer whale that year, which is significantly less than the species PBR.

The only seabird caught by this fishery in substantive numbers is the northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the other fisheries, this fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

Evidence Basis:
FMPs and protected species management plans are all widely available through NMFS and NPFMC websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Helker et al. 2017: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019b: https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables
NMFS 2019c: https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
NMFS 2019d: https://www.fisheries.noaa.gov/resource/document/seabird-bycatch-estimates-alaska-groundfish-fisheries-2018
NMFS 2017a: https://www.afsc.noaa.gov/publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
USFWS 2017: https://www.fws.gov/midwest/endangered/section7/section7.html

Non-Conformance Number (if relevant):

3.2.5 There shall be management objectives seeking to avoid, minimize or mitigate impacts of the unit of certification on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** management objectives for avoidance, minimization or	There are **insufficiently** clear objectives for avoidance,	There are **moderately clear** objectives for avoidance, minimization or	There are management objectives seeking to avoid, minimize or mitigate impacts of the

mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration" **Lacking in all parameters.**	minimization or mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration" **Lacking in two parameters.**	mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration" **Lacking in one parameter.**	unit of certification on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place by which the habitats essential to the stock under consideration and the potential impacts of the fishery (i.e. employing bottom contact gear) upon them are identified. This or a similar mechanism shall also be in place to identify habitats which are highly vulnerable to fishery activities by the Unit of Certification. The information provided by these mechanisms shall be used to produce specific management objectives related to avoiding significant negative impacts on habitats. When identifying highly vulnerable habitats, there value to ETP species shall be also considered, with habitats essential to ETP species being categorized accordingly. Note that this clause shall consider Alaska specific designation of important and essential fish habitats categorized as such at the State and federal level.

Current Status/Appropriateness/Effectiveness: There is evidence that the objectives described above are in place, and that effective management measures relative to those have been implemented.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, fishery management plans, data and reports.

Evaluation

Process:

The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to "prevent, mitigate or minimise, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to habitat areas of particular concern (HAPC). Each NPFMC FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

The latest EFH review developed a hierarchical impact assessment methodology to operationalise the "more than minimal and not temporary" criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below its limit reference point. For stocks at this level, mitigation measures would be required if the stock assessment author determines that there is a plausible connection to reductions in EFH. The next question is whether the "core EFH area" (CEA; defined as the 50% quantile of EFH) is disturbed by fishing. If so, then stock assessment authors must determine whether critical life-history characteristics of the stock are correlated with the proportion of CEA affected. If correlations suggest a plausible stock effect, plan teams and SSC will consider appropriate mitigation measures to recommend to NPFMC.

HAPCs are designated following a nomination process according to NPFMC priorities. HAPC nominations are generally on a five-year cycle but may be initiated at any time. Previous priorities have been seamounts and undisturbed coral areas; the last process was carried out according to a priority of identifying skate nursery areas. The SAFE reports also include specific indicators of vulnerable habitat (e.g., corals, sponges, sea whips) for which trends are monitored and appropriate mitigation may be implemented as necessary.

The mechanisms developed to identify significant effects on EFH and for identifying HAPC are considered consistent with achieving management objectives for avoidance, minimization, or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. This is further supported by habitat ecosystem

indicators considered as part of the SAFE process.

Current Status/Appropriateness/Effectiveness:
The processes for identifying effects on EFH and for designating HAPC have been developed to achieve the objectives described in the process parameter and have been successful in doing so.

Evidence Basis:
Reports on the EFH evaluation methodology, calls for identification of HAPC and identification of designated areas, and SAFE reports are all publicly available on NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019e: https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/

Non-Conformance Number (if relevant):

3.2.6 There shall be management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.
FAO ECO (2011) 36.9

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. **Lacking in all parameters.**	There are **insufficiently clear** management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. **Lacking in two parameters.**	There are **moderately clear** management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. **Lacking in one parameter.**	There are management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process in place by which adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible are identified. This process results in setting relative

management objectives. Management priority shall be focused primarily towards minimizing and avoiding impacts.
Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, or other regulatory document or laws.

Evaluation:

Process:
Effects on ecosystem aspects are considered more fully under Clauses 12.1-12.15. Essentially, there are several processes in place which demonstrably address actual or potential impacts identified through the monitoring of the groundfish fishery and the ecosystem supporting the fishery. The primary mechanism is the annual SAFE report. Following scientific assessment by the assessment authors and NMFS plan teams, information and recommendations are made to the Scientific and Statistical Committee (SSC) and NPFMC. The NPFMC, following reviews of relevant information, will recommend TACs for each target species. It is noted that this council review includes consideration of inputs on effects on habitats, protected species, and the wider ecosystem, all of which may affect decision making. The process of managing the groundfish fishery in relation to these considerations is set out in the FMPs. The FMPs are also subject to review through the PSEIS to determine the impacts of management options and so selection of the preferred options.

There are specific processes through which NMFS and USFWS review potential impacts (generally indirect effects through changes in prey availability) on endangered species (through the ESA) and marine mammals (via MMPA). Assessments of the effects of the Alaska groundfish fisheries on many endangered species are also provided in the Alaska Groundfish Harvest Specifications Environmental Impact Statement. There are also requirements for the relevant agency (NMFS or USFWS) to evaluate (provide a biological opinion) on the effects of the FMPs for the GOA and groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species. The biological opinion process has been followed, as required for Steller sea lion and chinook salmon in relation to these fisheries under assessment.

There is evidence from each aspect of the fishery management for the implementation of management responses (or the further analysis where impacts may be indirect and uncertain). In particular:

1. Conservative harvest levels are set for single and multi-species fisheries – these are demonstrable for each target species and group affected.
2. Acceptable Biological Catch levels are adjusted to account for uncertainty and wider effects on the ecosystem.
3. Measures are in place to minimise bycatch and discarding (see Clause 12.5), including specific requirements and management and operational responses relating to prohibited species (e.g., chinook salmon, halibut).
4. Measures have been implemented to minimise direct effects on endangered species and prohibited species (such as salmon escapement devices on trawls) and to minimise indirect effects (such as closure of essential habitat surrounding Steller sea lion rookeries).
5. Measures are in place to protect EFH and HAPCs, where relevant. Several HAPCs are designated in the EBS, AI, and GOA (see Clause 12.9).

There are processes in place, primarily through FMPs, endangered species management plans and biological opinions, and EISs of the various plans. They allow for direct and indirect impacts that are likely to have significant (not only serious) consequences to be addressed.

Current Status/Appropriateness/Effectiveness:
Wherever impacts are identified (and this is far more precautionary than only addressing only effects with serious consequences), there is evidence available to support the use of an immediate management response. In some cases, further information may be required, and if so, studies are implemented generally with an accompanying precautionary management measure. For example, the northern fur seal is listed as depleted under the MMPA, with the Eastern Stock population at less than 50% of its historical peak. This has already been considered in a precautionary way in TAC-setting through NPFMC consideration of ecosystem indicators, one of which is fur seal pup success. The 2007 Northern Fur Seal Conservation Plan is in the process of being updated and will continue to assess adverse effects of

human activities (i.e., disturbance, bycatch, research, illegal shooting, and entanglement).

Evidence Basis:
There is an extensive evidence base setting out the evaluation of effects and implementation of management response; this includes SAFE reports, FMPs, endangered species conservation plans, supporting EISs, and biological opinions. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2019g: https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
NMFS 2010: https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska
NMFS 2007: https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-harvest-specifications-environmental-impact-statement-eis
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2019b: https://www.npfmc.org/management-policies/
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019d: https://www.npfmc.org/crab-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2019f: https://www.npfmc.org/bering-seaaleutian-islands-groundfish/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

B. Science and Stock Assessment Activities flatfish

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

FAO CCRF (1995) 7.1.9/7.4.4/7.4.5/7.4.6/8.4.3/12.4
FAO ECO (2009) 29.1-29.3

FAO Eco (2011) 36.1, 36.3-36.5, 37.4

4.1 All fishery removals and mortality of the target stock(s) shall be considered by management. Specifically, reliable and accurate data required for assessing the status of fishery/ies and ecosystems - including data on retained catch, bycatch, discards and waste shall be collected. Data can include relevant traditional, fisher or community knowledge, provided their validity can objectively be verified. These data shall be collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery, and provided to relevant States and sub-regional, regional and global fisheries organizations.

FAO CCRF (1995) 7.3.1, 7.4.6, 7.4.7, 12.4

FAO Eco (2009) 29.1-29.3

FAO Eco (2011) 36.1, 36.3, 36.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** consideration of all fishery removals and mortality of the target stock through collection of reliable and accurate data on the status of fisheries and ecosystems (including data on retained catch, bycatch, discards and waste) performed by relevant management organizations at appropriate time and level of aggregation, provided to relevant States or organizations as appropriate. **Lacking in all parameters.**	There is **insufficient** consideration of all fishery removals and mortality of the target stock through collection of reliable and accurate data on the status of fisheries and ecosystems (including data on retained catch, bycatch, discards and waste) performed by relevant management organizations at appropriate time and level of aggregation, provided to relevant States or organizations, as appropriate. **Lacking in two parameters.**	There is **moderate** consideration of all fishery removals and mortality of the target stock through collection of reliable and accurate data on the status of fisheries and ecosystems (including data on retained catch, bycatch, discards and waste) performed by relevant management organizations at appropriate time and level of aggregation, provided to relevant States or organizations, as appropriate. **Lacking in one parameter.**	All fishery removals and mortality of the target stock(s) are considered by management. Specifically, reliable and accurate data required for assessing the status of fishery/ies and ecosystems - including data on retained catch, bycatch, discards and waste are collected. Data can include relevant traditional, fisher or community knowledge, provided their validity can objectively be verified. **Part below does not apply:** These data are collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery, and provided to relevant States and sub-regional, regional and global fisheries organizations, as appropriate. **Fulfils all parameters.**

Evaluation Parameters
Note that provision of data to relevant States and sub-regional, regional and global fisheries

organizations is dependent on the nature of the stock (i.e., shared, high seas stock) and the type or arrangement in place for co-management (i.e., commission, arrangement etc.). This part of the clause does not apply in cases where stocks occur entirely in one's State EEZ/jurisdiction and "co-management" with another country is not required.

Process: There is a process or system that allows for effective data collection (including data on retained catch, bycatch, discards and waste) on the status of fisheries and ecosystems for management purposes. In the case of stocks fished by more than one state, this includes a system or agreement with other states to ensure mortality and removals data are available for the entirety of the biological stock. Some fisheries and/or fish stock are hard to monitor for various reasons, including remoteness of operation/distribution and complexity of fishing operations, posing particular challenges with the collection and maintenance of adequate, reliable and current data and/or other information. Assessors shall acknowledge and explain these challenges, data collection and maintenance to cover all stages of fishery development, in accordance with applicable international standards and practices.

Current Status/Appropriateness/Effectiveness: There are appropriate and reliable data collection and estimation methods. Reliable and accurate data are collected on retained catch, bycatch, discards and waste (for directed and non-directed fisheries), and the direct and indirect impacts of the fishery on the ecosystem. Such information is disseminated to all relevant fishery management authorities. Overall, the data collection system is considered effective for the purposes of this clause if fishery scientists believe there is a high probability that the total estimated mortality is an accurate reflection of the actual total mortality across the entire biological stock. Fishery data are collected with a frequency and level of aggregation which allows the effective and informed management of the stock by all relevant authorities. The appropriate level of aggregation will often be the entire biological stock, but could also reflect specific habitats, gear types, sub-populations etc. The requirements for data collection are focussed on the need to assess the effects of the unit of certification on non-target stocks. Non-target catches and discards refers to species/stocks that are taken by the unit of certification other than the stock for which certification is being sought. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important inter alia because its capacity for supporting reliable assessment of current status and trends declines as it gets older. Adequate, reliable and current data and/or other information can include relevant traditional, fisher or community knowledge, provided its validity can be objectively verified (i.e. the knowledge has been collected and analysed though a systematic, objective and well-designed process, and is not just hearsay).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, catch and observer data.

Evaluation (per parameter)/:

Process: There is a satisfactory process to account for fishery removals and mortality of flatfish and all removals are considered in the assessment and management of the stocks. Reliable and accurate data are provided annually to assess the status of fisheries and ecosystems. These data including information on retained catch and bycatch in the directed fisheries by all gears, and catches in the Alaskan state-managed fisheries (inside 3 n. mi.), including subsistence and sportive fisheries. Several data reporting systems are in place to ensure timely and accurate collection and reporting of catch data. 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.

The North Pacific Observer Program (Observer Program) plays a vital role in the conservation and management of the Bering Sea, Aleutian Islands, and Gulf of Alaska groundfish and halibut fisheries. The program trains, briefs, debriefs, and oversees over 450 observers annually who collect catch data onboard fishing vessels and at onshore processing plants that is used for in-season management and scientific purposes such as stock assessments and ecosystem studies. The program ensures that the data collected by observers are of the highest quality possible by implementing rigorous quality control and quality assurance processes for the data collected by observers.

The Observer Program provides the regulatory framework for NOAA Fisheries certified observers to collect data on groundfish and halibut fisheries. The information collected by observers provides the best scientific information to manage the fisheries and to develop measures to minimize bycatch. Observers collect biological samples and fishery-dependent information on total catch and interactions with protected species. Managers use data collected by observers to monitor quotas, manage groundfish and prohibited species catch, and document and reduce fishery interactions with protected resources. Division staff process data and make it available to the Sustainable Fisheries Division of the Alaska Regional Office for quota monitoring, to scientists at the Alaska Fisheries Science Center for stock assessment, ecosystem investigations, and an array of research investigations, as well as the fishing industry itself which relies on observer data to monitor quotas and prohibited species catch (PSC).

In January 2013, NOAA Fisheries changed how observers in the partial coverage category are deployed, how observer coverage in the partial coverage category is funded, and which vessels and processors must have some or all of their operations observed. These changes increased the statistical reliability of data collected by the program, addressed cost inequality among fishery participants, and expanded observer coverage to previously unobserved fisheries.

Background

The Observer Program is implemented by regulations at subpart E of 50 CFR part 679 which authorize the deployment of observers and EM to collect information necessary for the conservation and management of the Bering Sea and Aleutian Islands and Gulf of Alaska groundfish and halibut fisheries. The information collected by observers provides the best available scientific information to manage the fisheries and to develop measures to minimize bycatch. Observers collect biological samples and fishery-dependent information on total catch and interactions with protected species. Managers use data collected by observers and electronic monitoring to monitor quotas, manage groundfish and prohibited species catch, and document and reduce fishery interactions with protected resources. Scientists use observer-collected data for stock assessments and marine ecosystem research.

Observer Program Categories

All participants in the federally-managed commercial groundfish fisheries off Alaska (except catcher vessels delivering unsorted codends to a mothership) are subject to Observer Program requirements. Through the Annual Deployment Plan, NOAA Fisheries has the flexibility to decide when and where to deploy observers in the partial coverage category based on a scientifically defensible deployment plan reviewed annually by the Council.

Vessels and processors are placed into one of two observer coverage categories:

Full coverage category
Partial coverage category

Full Coverage Category

Described at § 679.51(a)(2), the full coverage category includes:

catcher/processors (with limited exceptions described below)
motherships/catcher vessels while participating in AFA or CDQ pollock fisheries
catcher vessels while participating in CDQ groundfish fisheries (except: sablefish; and pot or jig gear catcher vessels)
catcher vessels while participating in the Central Gulf of Alaska Rockfish Program
inshore processor when receiving or processing Bering Sea pollock

Vessels and processors in the full coverage category obtain observers by contracting directly with permitted observer providers.

Partial Coverage Category

Described at § 679.51(a)(1), the partial coverage category includes:

catcher vessels designated on a Federal Fisheries Permit (FFP) when directed fishing for groundfish in federally managed or parallel fisheries, except those in the full coverage category
catcher vessels when fishing for halibut IFQ or CDQ
catcher vessels when fishing for sablefish IFQ or fixed gear sablefish CDQ

shoreside or stationary floating processor, except those in the full coverage category
Small catcher/processors placed in the partial coverage category as described at § 679.51(a)(3).

Three pools of partial coverage vessels

All vessels in the partial coverage category are placed into one of these pools with differing requirements. These pools and requirements are as follows:

No Selection pool. This category applies to all vessels fishing with hook-andline or pot gear that are less than 40 feet LOA, and all catcher vessels of any length exclusively fishing with jig, handline, troll, and dinglebar troll gear. In addition, vessels participating in NOAA Fisheries Electronic Monitoring innovation and research will not be required to carry an observer. Inclusion in this pool is re-evaluated each year in the Annual Deployment Plan and may change in the future. Eligible landings from vessels in the no selection pool are assessed the observer fee.

EM Trip Selection pool. This category applies to vessels using nontrawl gear in the partial coverage category that have been approved to be in the EM selection pool. Vessels that are approved to participate in the EM selection pool are required to log fishing trips and comply with EM deployment requirements; these vessels are not required to carry an observer. Once NOAA Fisheries approves a vessel for the EM selection pool, that vessel remains in the EM selection pool for the duration of the calendar year. Vessel owners or operators whose vessel is in this selection pool are required to log each fishing trip into ODDS.

Observer Trip Selection pool. This category applies to catcher vessels of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 40 feet LOA. Vessel owners or operators whose vessel is in this selection pool are required to log each fishing trip into ODDS. On logging your trip, you will be immediately informed if the trip has been randomly selected for observer coverage. If the logged fishing trip is selected, then the vessel must take an observer on that trip. The observer will be provided by an observer provider contracted by NOAA Fisheries. Vessel owners or operators in this pool must log fishing trips at least 72 hours before anticipated departure.

FFP holders are not required to carry an observer or EM system while they fish in the State of Alaska guideline harvest level groundfish fisheries, unless they are retaining IFQ species or halibut CDQ during those fisheries.

Current Status/Appropriateness/Effectiveness: The data collection and catch estimation methods for flatfish are appropriate, reliable, and well documented. Accurate data are collected on retained catch, bycatch, discards and waste (for directed and non-directed fisheries), non-target species, and the direct and indirect impacts of the flatfish fishery on the ecosystem. Such information is available to all relevant fishery management authorities, such as NMFS and ADFG. Fishery data are collected with a frequency and level of aggregation which allows the stock assessments to be conducted annually or biannually both in BSAI and GOA, as outlined previously, and contributes to effective and informed management of the stock components. The total estimated mortality is an accurate reflection of the actual total mortality across the entire biological stocks, based on these stock assessments. The SAFE reports explicitly state that flatfish stocks are not known to exhibit any special life history characteristics that would require it to be assessed or managed differently from other groundfish stocks (e.g. P. cod) in the BSAI or GOA. The biological units are not considered to extend beyond the jurisdiction of the management organisations with the managed stocks being restricted to the Alaska EEZ.

When fish are landed, a representative of the processor submits the landing report into eLandings and a paper "fish ticket" is printed for both the processor and the vessel representative to sign. Landing reports are mandatory for all processors required to have a Federal processing permit. Landing reports include the fishing start date, the delivery date, gear type, area fished, a breakdown of the weight and condition of each species delivered, and weights of any species that were discarded at the plant before processing. Landings are verified by shore-based observers, and estimates of discards in the flatfish fisheries are compiled from fishing logbooks and at-sea observer data.

The CAS combines observer and industry information such as e-landings to create estimates of total catch. The CAS procedures complement the sampling procedures established under the restructured observer program. By-catches in the directed flatfish fisheries are recorded by observers, reported through the CAS, and presented in the annual stock assessments. Sport and subsistence removals are not reported to CAS, but are estimated by ADF&G and are relatively minor for flatfish in any case.

Evidence Basis: Additional details on the catch reporting and estimation processes can be found in

Cahalan et al. 2014, and more information on commercial flatfish catches is found in the 2018 SAFE documents (2018 SAFE reports). Catch reports for flatfish in the BSAI and GOA Regions for 2018 and previous years can be found on the NMFS Alaskan fisheries website (NMFS 2018). ADFG also produces catch documentation on the state-managed flatfish fisheries (ADGF 2018).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Cahalan, J., Mondragon, J., Gasper, J., 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska. In: NOAA Tech Memo. NMFSAFSC-286. National Oceanic and Atmospheric Administration, 2015 edition, http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-286.pdf

NMFS2018 catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings

2018 SAFE REPORTS FOR FLATFISH
http://www.afsc.noaa.gov/REFM/Stocks/assessments.htm
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

ADFG 2018, https://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.main

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.4.4, 12.3, 12.13
FAO Eco (2009) 29.1, 29.3

FAO Eco (2011) 36.3, 36.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**

There is **no** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is **no** promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in all parameters.**	There is **insufficient** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is **insufficient** promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in two parameters.**	There is **moderate** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is **moderate** promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in one parameter.**	Timely, complete and reliable statistics are compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly and verified through an appropriate system. The use of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage, between applied research and fisheries management (e.g. adoption of scientific advice) is promoted. Results of analysis are distributed accordingly as a contribution to fisheries conservation, management and development. **Fulfils all parameters.**
Evaluation Parameters **Process**: There is a process or system that allows for the production, maintenance, update, and verification of statistical data to international standards. Such standards include the FAO coordinating working party on fishery statistics Handbook of Fishery Statistical Standards. Also, there is a process for the use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g. adoption of scientific advice). **Current Status/Appropriateness/Effectiveness**: There is evidence for the production, maintenance, updating and review of statistical data on catch and fishing effort in the fishery under assessment. There is evidence that the best and most up-to-date scientific information is used to inform the fisheries management process. Where there is a legal requirement for the advice of scientific authorities to be adopted, this shall be viewed as conformance with this evaluation parameter. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports and other data.			
Evaluation Parameters **Process**: For all Alaskan flatfish fisheries, there is a well-established system that allows for the production, maintenance, regular update, and verification of statistical data. This system includes the CAS described in the previous section, as well as websites and detailed publications maintained by NMFS and other agencies. These processes are fully compliant with international standards such as the FAO Handbook of Fishery Statistical Standards, in that key information such as landings, areas, fleets, gear, number of fishers, etc. is collected and maintained in accessible databases. The use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria is driven by the NPFMC management process (NPFMC 2018). Results of stock assessments and management decisions are well documented and available in timely			

fashion.

Current Status/Appropriateness/Effectiveness: There is ample evidence for the effective production, maintenance, updating and review of statistical data on catch and fishing effort in the flatfish fisheries in Alaska. Long time series of catch and effort data exist for all flatfish, and are regularly updated and used in the stock assessments, which are conducted on all stocks on an annual basis. Data on the fisheries is kept, maintained, and updated on various NMFS, ADFG, and NPFMC websites. The stock assessments involve rigorous peer review that includes scientists from NMFS, ADFG, universities, as well as other organizations. The best and most recent scientific information is reviewed and is used to conduct the assessments and thusly inform the fisheries management process. Results of various research projects, applied studies, research surveys, etc. are reviewed and feed into the stock assessment process and management of the Alaskan flatfish fisheries. Management is clearly is based on the scientific advice, without exception.

Evidence Basis: Data on catches of Alaskan flatfish are maintained and updated by NMFS and are available on their website (NMFS 2018). The SAFE documents (SAFE reports) for the flatfish stock components contain extensive details on the catch and other data time series used in the stock assessments, including the catches from the state-managed fisheries.
Moreover, the Alaska Fisheries Information Network (AKFIN, 2018) was established in 1997 and maintains an analytic database of both state and federal commercial fisheries data in Alaska relevant to the needs of fisheries scientists and other users, and provides that data in usable formats.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPFMC 2018. FMPs http://www.npfmc.org/fishery-management-plans/
NMFS 2018. Catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings
AKFIN 2018. http://www.akfin.org/about-akfin

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

4.1.2 In the absence of specific information on the "stock under consideration", generic evidence based on similar stocks can be used for fisheries with low risk to that "stock under consideration". However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries.

FAO Eco (2009) 30.4

FAO ECO (2011) 37.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
If appropriate, there is **no** use of generic evidence based on similar stocks for fisheries with low risk to that "stock under consideration". **Lacking in all parameters.**	If appropriate, there is **insufficient** availability or use of generic evidence based on similar stocks for fisheries with low risk to that "stock under consideration", taking into account that the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. **Lacking in two parameters.**	If appropriate, there is **moderate** availability or use of generic evidence based on similar stocks for fisheries with low risk to that "stock under consideration", taking into account that the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. **Lacking in one parameter.**	In the absence of specific information on the "stock under consideration", generic evidence based on similar stocks can be used for fisheries with low risk to that "stock under consideration". However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. **Fulfils all parameters.**

Evaluation Parameters

Note: if the fishery for the stock under consideration is managed fully using stock-specific information then this clause can be scored with full conformance.

Process: There is a process that allows for the use of generic evidence based on similar stocks for fisheries with low risk to that "stock under consideration". The greater the risk, the more specific evidence is necessary to assess sustainability. In principle, 'generic evidence based on similar stocks' should not suffice, but it may be adequate where there is low risk to the stock under consideration. In general, "Low risk to the stock under consideration" would suggest that there is very little chance of the stock becoming overfished, for example where the exploitation rate is very low and the resilience of the stock is high. However, the evidence for low risk and the justification for using surrogate data shall come from the stock assessment itself.

Current Status/Appropriateness/Effectiveness: Information has been utilized from generic evidence based on similar fishery situations. Based on the risk of overfishing, the information utilized is of higher precision to account for higher risks (i.e. intensive fisheries).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports and other data.

Evaluation (per parameter)/:

As per Note in the Evaluation Parameters section in this clause, this clause is scored with Full Conformance, as the flatfish assessments are conducted on a stock-specific basis. The SAFE reports explicitly state that flatfish stocks are not known to exhibit any special life history characteristics that would require it to be assessed or managed differently from other groundfish stocks in the BSAI or GOA. The biological units are not considered to extend beyond the jurisdiction of the management organisations with the managed stocks being restricted to the Alaska EEZ.

Conclusion: NA

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.4.3
FAO Eco (2009) 29.2bis

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No observer scheme designed to collect accurate data for research and to support compliance. **Lacking in all parameters.**	Observer scheme established but there is **insufficient** collection of accurate data for research and to support compliance. **Lacking in two parameters.**	Observer scheme established but there is **moderate** collection of accurate data for research and to support compliance. **Lacking in one parameter.**	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures is established. **Fulfils all parameters.**

Evaluation Parameters
Process: Presence of an observer program. There may be cases where collection of accurate data for research and support compliance could be established without the use of observers (i.e., inspection scheme, enforcement, port sampling, at shore inspection, voluntary or compulsory logbooks, e-logbooks, electronic monitoring (video), or bycatch surveys). The reliability and accurateness of that system(s) would need to be verified accordingly. Note also that some fisheries observer programs are designed to collect biological data and in others they also serve mainly as a compliance or enforcement tool. This shall be considered accordingly in the overall evaluation of this clause). The core focus of the clause shall go back to questioning whether the required data for fisheries management are collected or if there are important data gaps (e.g., because of the absence of an observer program).
Current Status/Appropriateness/Effectiveness: The data collected by the observer program is considered accurate and useful.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment, observer, survey, observer or other reports.

Evaluation (per parameter)/:
Process: 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 (NMFS, 2015). This extensive observer program exists for fisheries in both Alaskan federal waters, and observers collect the required data for fisheries management. According to the evidenced available from SAFE 2018 reports flatfish catches from state waters are negligible.

Current Status/Appropriateness/Effectiveness: All vessels in federally managed or parallel groundfish fisheries off Alaska are assigned to one of two categories: 1) the full observer coverage category, where vessels and processors have at least one observer present for all fishing activity, or 2)

the partial observer coverage category, where NMFS determines when and where observer coverage is needed. Observer coverage in the flatfish fishery has been at or near 100% for the past several years, while in the GOA, lower coverage rates exist. Data gathered in the NPGHOP 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. For halibut, viability (injury and condition) data are collected by observers to generate halibut discard mortality rates (DMR) in Alaskan groundfish fisheries.

As well as providing data for stock assessment and other scientific purposes, the observer program is also used extensively for in- and post-season management. Daily reports are electronically transmitted via the CAS system and can be used as the basis to trigger closures e.g. if maximum catch allocations of target or Prohibited Species are caught. Annual reports from the Observer Program contain detailed information on fees and budgets, deployment performance, enforcement, and outreach. NMFS has already noted progress on incorporating variances associated with catch estimates, and will continue to report as work progresses.

Evidence Basis: Detailed annual reports from the Observer Program can be found on AFSC and NMFS websites (ASFC 2018). Data collected by the observer program feed directly into various datasets and studies used in the stock assessments (e.g. SAFE documents). As outlined in the 2018 Observer Sampling Manual, over 400 certified groundfish observers are deployed each year on a variety of commercial fishing vessels for numerous Alaskan fisheries, including flatfish, providing the Observer Program with over 30,000 data collection days annually (ASFC 2016). Information on calculation of DMRs for Alaskan fisheries can be found in the DMR WG report (see http://npfmc.legistar.com/gateway.aspx?M=F&ID=34847078-2ed2-4d3c-85a5-73e26235c1d5.pdf).
NMFS and the NPFMC have developed an Electronic Monitoring (EM) Strategic Plan to integrate video monitoring into the Observer Program to improve data collection (NMFC 2017). 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. However, there are no cathces of flatfish from vessels smaller than 40 ft.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NMFS 2015. https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf

https://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.stateSubData
https://www.adfg.alaska.gov/sf/sportfishingsurvey/index.cfm?ADFG=area.results
ASFC 2018. Observer report for 2018. https://www.afsc.noaa.gov/Publications/ProcRpt/PR2018-07.pdf
ASFC 2016. Observer manual
https://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2016.pdf

NPFMC 2017 EM https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPre-impPlan.pdf

Non-Conformance Number (if relevant):

4.3 Sub-regional or regional fisheries management organizations or arrangements shall compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.

FAO CCRF (1995) 7.4.6/7.4.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is **no** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in all parameters.**	There is **insufficient** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in two parameters.**	There is **moderate** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in one parameter.**	Sub-regional or regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no regional or sub-regional body is involved in fishery management between one or more countries.
Process: There is a system within the regional or sub-regional body structure that allows for data distribution in line with confidentiality requirements.
Current Status/Appropriateness/Effectiveness: There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports where confidentiality requirements have been effected.

Evaluation (per parameter)/:
Process: There are systems within NMFS, NPFMC, and ADFG management structures that allow for complete data distribution in line with confidentiality requirements.

Current Status/Appropriateness/Effectiveness: NMFS and ADFG have extensive scientific databases which include flatfish stocks and NPFMC has substantial information on management of flatfish stocks in Alaskan waters. These data are made widely available through the agency websites, publications and at various publically-attended meetings. Data on certain aspects of commercial fishing are considered to be confidential, such as analysis and reporting of fishery data, depending on the number of individuals or entities involved.

Evidence Basis: NPFMC management plans, and SAFE documents contained detailed data which is widely disseminated, and confidentiality is maintained as necessary. The Commercial Fisheries Entry Commission (see CFEC website https://www.cfec.state.ak.us/) is the designated records manager for ADFG fish ticket records. Fish ticket records are retained by the Commission for 45 years, and are confidential as defined by AS 16.05.815 and 16.40.155 (CFEC 2018).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
CFEC 2018 https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2018-2019/akpen/CFEC_memo.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF 12.7

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** stimulation of research required to support national policies related to fish as food. **Lacking in all parameters.**	There is **insufficient** stimulation of research required to support national policies related to fish as food. **Lacking in two parameters.**	There is **moderate** stimulation of research required to support national policies related to fish as food. **Lacking in one parameter.**	The State stimulates the research required to support national policies related to fish as food. **Fulfils all parameters.**

Evaluation Parameters
Process: There is research to support national policies related to fish as food.
Current Status/Appropriateness/Effectiveness: There is evidence of this research.
Evidence Basis: Availability, quality, and adequacy of the evidence.

Evaluation (per parameter)/:
Process: State and national policies regarding seafood are guided by the Alaska Seafood Marketing Institute (ASMI), U.S. Food and Drug Administration (FDA), U.S. Department of Agriculture (USDA), and the U.S. National Institute of Health (NIH).

Current Status/Appropriateness/Effectiveness: Alaska supports both a Seafood Marketing Institute and the Kodiak Seafood and Marine Science Center to stimulate research and to support and distribute the benefits of seafood in human diets.

Evidence Basis: ASMI (see ASMI http://www.alaskaseafood.org) is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training and sustainability certification. ASMI's role includes conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state.

Through the University of Alaska Fairbanks, the state of Alaska also operates the Kodiak Seafood and Marine Science Center (see UAF Kodiak Center https://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/), which directs efforts in several fields, including seafood processing technology, and seafood quality and safety. KSMSC staff work closely with the fishing industry to convey research results and provide educational opportunities that help seafood workers improve efficiency and the quality of their products.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
ASMI 2018. http://www.asm.com/Downloads/2018_ASMI_Annual_Report.pdf

UAF 2018. https://www.uaf.edu/finserv/omb/reports-presentations/

Non-Conformance Number (if relevant):

4.5 States shall ensure that a sufficient knowledge of the economic, social, marketing and institutional aspects of fisheries is collected through data gathering, analysis and research and that comparable data are generated for ongoing monitoring, analysis and policy formulation.

FAO CCRF (1995) 7.4.5, 12.9

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation. **Lacking in all parameters.**	There is **insufficient** assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation. **Lacking in two parameters.**	There is **moderate** assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation. **Lacking in one parameter.**	The state ensures 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. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system in place by which knowledge of the economic, social, marketing and institutional aspects of fisheries is collected.
Current Status/Appropriateness/Effectiveness: These data are used for ongoing monitoring, analysis and policy formulation.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on social/cultural/economic value of the resource.

Evaluation (per parameter)
Process: Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the Magnuson-Stevens Act (MSFCMA or MSA), the NEPA, the Endangered Species Act, and other applicable laws. AFSC/NMFS Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska (NMFS 1996).

Current Status/Appropriateness/Effectiveness: The economic and socio-economic data collected for the flatfish fisheries are extensive, and data are used for ongoing analysis. These analyses include estimates of groundfish catch (including flatfish), 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 fisheries off Alaska, and employment on at-sea processors. Annual reports contain a wide range of analyses and information on the performance of numerous indices for different sectors of the North Pacific fisheries, including flatfish, and relate changes in value, price, and quantity, across species, product and gear types, to changes in the market.

Evidence Basis: Annual economic SAFE reports on social/cultural/economic value of the Alaskan fisheries resources are produced, which include extensive information on the Alaskan P. cod fisheries. A report prepared by the McDowell Group in 2015 for ASMI quantifies the regional, state-wide, and national economic impacts of Alaska's seafood industry (McDowell 2015). This report summarizes overall industry impacts, participation, value, and exports. Flatfish assessment SAFE reports have extensive sections on the economic performance. The comprehensive Economic Status Report (Fissel et al., 2019) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market. This report includes a considerable amount of

economic data for the commercial flatfish fisheries (Fissel et al., 2019), and a summary appears in each stock assessment in SAFE 2018 reports.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Fissel et al., 2019. This report will be available at:
http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf

NMFS 1996, MSFCMA http://www.nmfs.noaa.gov/sfa/magact/
McDowell 2015. The McDowell Group report
http://ebooks.alaskaseafood.org/ASMI_Seafood_Impacts_Dec2015/#/0/

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

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.

FAO CCRF 12.12

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in all parameters.**	There is **insufficient** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in two parameters.**	There is **moderate** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in one parameter.**	The State investigates and documents 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. **Fulfils all parameters.**

Evaluation Parameters
Process: Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.
Current Status/Appropriateness/Effectiveness: There are records of the documentation of small scale fisher practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various fisheries reports.

Evaluation (per parameter)/:

Process: Highly developed fisheries such as those for Alaskan flatfish incorporate broad knowledge sources into fisheries management. A stated objective in the NPFMC FMPs is to increase Alaska Native consultation.

Current Status/Appropriateness/Effectiveness: Most flatfish catches in Alaskan waters are taken in large-scale operations such as catcher /processors or large catcher vessels. Smaller fisheries such as some of the state-managed ones in are effectively regulated and take into account any issues related to smaller scale localized fisheries. NPFMC FMPs specifically consider an objective to increase Alaska Native consultation by a) continuing to incorporate local and traditional knowledge in fishery management; b) considering ways to enhance collection of local and traditional knowledge from communities; and c) incorporating such knowledge in fishery management where appropriate.

Evidence Basis: All data from the state and federally managed flatfish fisheries are included in the stock assessments. Relative to commercial catch, there is minimal recreational, personal use, or subsistence fishing for flatfish in Alaskan waters, and all estimates of such catches compiled by ADFG are included in the assessment catch data. Smaller scale fisheries managed by ADFG and BOF are controlled with specified Guideline Harvest Level (GHL) and other regulations, such as closed areas around Steller sea lion rookeries (see ADFG Commercial Fisheries news release https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/634206707.pdf).
The NPFMC established a Community Engagement Committee (see https://www.npfmc.org/committees/cec/) 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. Further details on this are contained in Clauses 2.2 and 8.3.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
ADFG 2018, https://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.main
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

Not applicable

4.7 States conducting scientific research activities in waters under the jurisdiction of another State shall ensure that their vessels comply with the laws and regulations of that State and international law.

FAO CCRF 12.14

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**

Research vessels do **not** comply with the laws and regulations of that State and international law. **Lacking in all parameters.**	Research vessels **insufficiently** comply with the laws and regulations of that State and international law. **Lacking in two parameters.**	Research vessels **moderately** comply with the laws and regulations of that State and international law. **Lacking in one parameter.**	The state conducting scientific research activities in waters under the jurisdiction of another State ensures that their vessels comply with the laws and regulations of that State and international law. **Fulfils all parameters.**

Evaluation Parameters
Note: If the stock is fully managed by one state and there is no need for shared stock research (between two or more jurisdictions), then this clause is not applicable.
Process: There is a system in place to manage the conduct of research vessels operating in waters under the jurisdiction of other states
Current Status/Appropriateness/Effectiveness: If so, there is record of such shared research activities and they comply with required regulations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports.

Evaluation (per parameter)/:
The stocks are fully managed by the USA, and the fishery occurs in the US EEZ. Thus there is no need for shared stock research with other jurisdictions and this clause is not applicable**.**

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not applicable

4.8 States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and shall, where appropriate, support the establishment of mechanisms, including, inter alia, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and shall encourage the sharing of such research results with other regions.
FAO CCRF 12.15, 12.16

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Does **not** promote adoption of uniform guidelines governing high seas research or sharing of data between regions or sub-regions.	**Insufficiently** promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions.	**Moderately** promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions.	States promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and, where appropriate, support the establishment of mechanisms, including, *inter alia*, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional

Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	level and encourage the sharing of such research results with other regions. **Fulfils all parameters.**

Evaluation Parameters
If the stock is fully managed by one state and there is no need for shared stock research (between two or more jurisdictions), then this clause is not applicable.
Process: There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas.
Current Status/Appropriateness/Effectiveness: There is a record of uniform high seas research guidelines or a mechanism to create them.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports, high seas guidelines.

Evaluation (per parameter)/:
The stock is fully managed by the USA, and the fishery occurs in the US EEZ. Thus there is no need for shared stock research with other jurisdictions and this clause is not applicable**.**

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not applicable
4.9 States and relevant international organizations shall promote and enhance the research capacities of developing countries, inter alia, in the areas of data collection and analysis, information, science and technology, human resource development and provision of research facilities, in order for them to participate effectively in the conservation, management and sustainable use of living aquatic resources.

FAO CCRF 12.18

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Does **not** enhance research capacity of developing countries. **Lacking in all parameters.**	**Insufficiently** enhance research capacity of developing countries. **Lacking in two parameters.**	**Moderately** enhance research capacity of developing countries. **Lacking in one parameter.**	States and relevant international organizations promote and enhance the research capacities of developing countries, *inter alia*, in the areas of data collection and analysis, information, science and technology, human resource development and provision of research facilities, in order for them to participate effectively in the conservation,

			management and sustainable use of living aquatic resources. **Fulfils all parameters.**

Evaluation Parameters
Note: This clause is only applicable when the Unit of Certification includes a transboundary stock which is fished by one or more developing countries.
Process: There is a mechanism in place by which the research capacities of developing countries can be developed and enhanced. This could include, but is not limited to, the provision of personnel, equipment, or funding, or cooperation on data collection and stock assessment.
Current Status/Appropriateness/Effectiveness: There are recognizable examples of instances in the history of the fishery under assessment where actions by the managers of the Unit of Certification have promoted or enhanced the research capacity of one or more developing nations in the ways described above.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.

Evaluation (per parameter)/:
The flatfish stocks are fully managed by the USA, and the fishery occurs in the US EEZ. There are no developing countries involved in this fishery, and thus this clause is not applicable.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not applicable

4.10 Competent national organizations shall, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished.
FAO CCRF 12.19

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Does **not** render technical and financial support. **Lacking in all parameters.**	**Insufficiently** render technical and financial support. **Lacking in two parameters.**	**Moderately** render technical and financial support. **Lacking in one parameter.**	Competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. **Fulfils all parameters.**

Evaluation Parameters

Note: This criterion does not apply to fully developed fisheries, as defined by the FAO. The FAO definition of a developed fishery is "a fishery which, following a period of rapid and steady increase of fishing pressure and catches, has reached its level of maximum average yearly production. It is usually understood that such a fishery is yielding close to its maximum sustainable yield".
Process: There is a mechanism to allow a national organization to render technical and financial support to the State.
Current Status/Appropriateness/Effectiveness: There is a record of the provided technical and financial support.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.

Evaluation (per parameter)/:
This fishery meets the FAO definition of a developed fishery, and thus this clause is not applicable.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

Not applicable

4.11 Relevant technical and financial international organizations shall, upon request, support States in their research efforts, devoting special attention to developing countries, in particular the least developed among them and small island developing countries.

FAO CCRF 12.20

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Competent national organizations, where appropriate, do **not** render technical and financial support towards research effort. **Lacking in all parameters.**	Competent national organizations, where appropriate, **insufficiently** render technical and financial support towards research effort. **Lacking in two parameters.**	Competent national organizations, where appropriate, **moderately** render technical and financial support towards research effort. **Lacking in one parameter.**	Competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. **Fulfils all parameters.**

Evaluation Parameters
Note: this clause is relevant where the fishery is within a developing region/small island region and management of the resource is performed through an international organization.
Process: The international management component of the fishery is engaged in processes that support the fishery based in developing countries.
Current Status/Appropriateness/Effectiveness: **Evidence Basis:**

Evaluation (per parameter)/: This fishery does not include a developing or small island region and thus this clause is not applicable.				
Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐
References:				
Non-Conformance Number (if relevant):				

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

FAO CCRF (1995) 7.2.1/12.2/12.3/12.5/12.6/12.7/12.17
FAO Eco (2009) 29-29.3, 31
FAO Eco (2011) 42

5.1 An appropriate institutional framework shall be established to determine the applied research which is required and its proper use (i.e. assess/evaluate stock assessment model/practices) for fishery management purposes.

FAO CCRF 12.2, 12.6

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Establishment of appropriate institutional framework for applied research does **not** exist. **Lacking in all parameters.**	The appropriate institutional framework is established to determine the applied research required, but there is **insufficient** use for fishery management purposes. **Lacking in two parameters.**	The appropriate institutional framework is established to determine the applied research required, but there is **moderate** use for fishery management purposes. **Lacking in one parameter.**	An appropriate institutional framework is established to determine the applied research required, and its proper use (i.e., assess and evaluate stock assessment models or practices) for fishery management purposes. **Fulfils all parameters.**

Evaluation Parameters
Process: There is an established institutional framework for fishery management purposes that determines applied research needs and use.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that essential research for fishery management purposes is determined and carried out. This research generally includes routine stock(s) and ecosystem assessment reports.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include description of the overall process of research assessment and peer review, stock and ecosystem assessment reports.

Evaluation (per parameter)/:

Process: 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) in Seattle, which operates several laboratories and Divisions. The Auke Bay Laboratories in Alaska conduct

scientific research on fish stocks, fish habitats, and the chemistry of marine environments. 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 an annual Economic Status Report. ADFG has a well-developed research capacity and conducts surveys and stock assessments in State waters to help determine safe harvest levels. NPFMC actively encourages stakeholder participation, and all Council deliberations are conducted in open, public sessions.

Current Status/Appropriateness/Effectiveness: Peer reviewed stock assessments are done annually and used as the scientific basis to set catch quotas for the flatfish stocks. The assessments take into account uncertainty and evaluate stock status relative to reference points. 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; and alternative harvest strategies and related effects on the component species groups. Various biological studies and surveys which feed data into the stock assessments are reviewed as well. The SAFE reports are scientifically based, consider all available research on flatfish and provide information to NPFMC for determining annual harvest specifications, documenting significant trends or changes in the stocks, marine ecosystem, and fisheries. The SAFE reports are comprehensive and publically available. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by the Center of Independent Experts (CIE), and any recommendations are addressed in subsequent stock assessments.

Evidence Basis: The NMFS/AFSC website has detailed information on Alaskan flatfish research and stock assessment (see https://www.fisheries.noaa.gov/resource/data/2018-assessment-flatfish-stock-complex-gulf-alaska and https://www.fisheries.noaa.gov/resource/data/2018-assessment-flatfish-stock-complex-BSAI). The SAFE reports (see Section 4 above for details and references to the flatfish SAFE documents for 2018) are compiled annually by the BSAI and GOA Groundfish Plan Teams, which are appointed by the NPFMC. As outlined in the current NPFMC Groundfish FMPs for BSAI and GOA, scientists from the AFSC, ADFG, other agencies, and universities prepare a Stock Assessment and Fishery Evaluation (SAFE) report annually. The SAFE report consists of three volumes: a volume containing stock assessments, one containing economic analysis, and one describing ecosystem considerations. Chapters of the assessment volume deal with each stock assessment (e.g. for each P. cod stock assessment). This document is reviewed first by the NPFMC Groundfish Plan Team, then by the Scientific and Statistical Committee (SSC) and Advisory Panel, and finally by the full Council. The review by the SSC [106] constitutes the official scientific review for purposes of the Information Quality Act. Upon review and acceptance by the SSC, the SAFE report and any associated SSC comments constitute the best scientific information available for purposes of the Magnuson-Stevens Act.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIflathead.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

5.1.1 With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries resulting in greater uncertainty about the state of the stock under consideration, more precautionary approaches to managing fisheries on such resources shall be required, including where appropriate, lower level of utilization of resources. A record of good management performance may be considered as supporting evidence of the adequacy and the management system.

FAO Eco (2011) 42

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are **not** required, including where appropriate, lower level of utilization of resources. **Lacking in all parameters.**	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are **insufficiently** required, including where appropriate, lower level of utilization of resources. **Lacking in two parameters.**	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are **moderately** required, including where appropriate, lower level of utilization of resources. **Lacking in one parameter.**	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are required, including where appropriate, lower level of utilization of resources. **Fulfils all parameters.**

Evaluation Parameters
Note: if the fishery for the stock under consideration has sufficient data collected through regular stock assessment activities for its management then this clause can be scored with full conformance.
Process: There is a process that allows for the application of more precautionary approaches to managing fisheries (e.g. lower exploitation rates) on resources assessed through stock assessment methods resulting in greater uncertainty about the state of the stock under consideration.
Current Status/Appropriateness/Effectiveness: There is evidence for the application of precautionary approaches to managing fisheries (e.g. lower exploitation rates) on resources assessed through stock assessment methods resulting in in greater uncertainty about the state of the stock under consideration.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports and other data.

Evaluation (per parameter)/: Based on the Note under Evaluation Parameters in this section, the fisheries under consideration have sufficient data, and this clause can be scored with full conformance (see SAFE reports 2018).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

5.1.2 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. Results of analyses shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

FAO CCRF (1995) 12.1/7.4.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The state does **not** conduct and make available appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and institution building to	The state conducts and makes available **insufficiently** appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and	The state conducts and makes available **moderately** appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and	States 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 is disseminated accordingly. States also ensure the availability of research facilities and

conduct the research. **Lacking in all parameters.**	institution building to conduct the research. **Lacking in two parameters.**	institution building to conduct the research. **Lacking in one parameter.**	provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries. **Fulfils all parameters.**

Evaluation Parameters
Process: There are organizations and processes in place to permit research into all aspects of fisheries, as listed in the clause.
Current Status/Appropriateness/Effectiveness: Research is carried out in fisheries biology, fisheries ecology, fisheries technology, environmental science, fisheries economics, social science, aquaculture, nutritional science. In fisheries where there is no demonstrable nutritional science being conducted, but all other types of research are carried out, the fishery shall be deemed compliant with this evaluation parameter.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment, economic value, fleet and other reports.
Evaluation Parameters

Process: Appropriate research is conducted into all aspects of flatfish fisheries by NMFS, ADFG, and researchers from universities and other agencies, including collaborative efforts with the fishing industry. A research plan and/or list of priorities is published in the annual SAFE document, and biology, ecology, stock assessment, and environmental science are all covered by these plans. A number of broad ecosystem-wide projects provide extensive data on Alaskan stocks (including flatfish) and environmental conditions. Economic analyses and social science are conducted by NMFS/AFSC, and ADFG.

Current Status/Appropriateness/Effectiveness: Comprehensive research into flatfish biology, ecology, and environmental science is conducted by NMFS and ADFG staff, along with several other institutions. Several surveys are conducted annually or biennially in the EBS, AI, and GOA Regions which are used to derive indices of flatfish abundance. NMFS research plans, data gaps, and priorities are listed in the annual SAFE documents. Regarding socio-economic data collection, AFSC Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. All results of research is available to the public in readily understandable fashion. Thus the best scientific evidence is made readily available as a contribution to fisheries conservation and management. Research facilities and appropriate training are provided at a number of locations in Alaska.

Evidence Basis: Extensive research, survey, and stock assessment results are described in the SAFE documents from 2018 (referenced in Clause 4.1.1 above). Numerous other documents are published in a variety of sources each year, containing biological and ecological studies on flatfish, details of stock assessment, and survey methodology and results. The SAFE reports explicitly state that flatfish stocks are not known to exhibit any special life history characteristics that would require it to be assessed or managed differently from other groundfish stocks in the BSAI or GOA.

The comprehensive Economic Status Report (Fissel et al., 2019) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market. This report includes a considerable amount of economic data for the commercial flatfish fisheries (Fissel et al., 2019), and a summary appears in each stock assessment in SAFE 2018 reports.
The Bering Sea Project, a partnership between the The North Pacific Research Board (NPRB) and the National Science Foundation, is studying the Bering Sea ecosystem from atmospheric forcing and physical oceanography to humans and communities, as well as socio-economic impacts of a changing marine ecosystem. Scientists and researchers from a number of agencies and universities are involved. Ecosystem modelling, sound data management, and education and outreach activities are included in the

program (see https://www.nprb.org/long-term-monitoring-program/about-the-program/). An integrated GOA Ecosystem project, also funded by the NPRB, is examining recruitment processes of major groundfish species.

The University of Alaska (see https://www.uaf.edu/sfos/research/fisheries/) provides bachelor, masters and doctoral programs in fisheries science, associate degrees and certificates in fisheries technology. University faculty supervise graduate student research on a broad array of biological topics including quantitative stock assessment, biology and ecology of marine and freshwater species, molecular genetics, and behavioural ecology. Facilities are located in Juneau, Seward, Kodiak and Fairbanks. The University of Alaska Fairbanks Kodiak Seafood and Marine Science Center (see http://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/) promotes the sustainable use of Alaska fisheries through collaborative research, application, education and information transfer. The areas of focus include seafood safety and quality, product markets and development, and bycatch reduction and environmental concerns.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Fissel et al., 2019. This report will be available at:
http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 12.5
FAO Eco (2009) 31

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in all parameters.**	There is an **insufficiently** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in two parameters.**	There is a **moderately** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in one parameter.**	There is established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system that establishes the required research capacity needed to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.
Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that there is sufficient research capacity in place for assessing and monitoring the state of the stock under consideration, impacts of fishing pressure, pollution and habitat alteration and the effects of climate or environment change on fish stocks and aquatic.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock, ecosystem and habitat assessment reports.

Evaluation (per parameter)/:
Process: The NMFM, ADFG, and University of Alaska maintain established research programs to monitor the state of the flatfish stocks and effects of fishing, pollution, habitat alteration and climate change.

Current Status/Appropriateness/Effectiveness: : NPFMC receives comprehensive presentations on the status of Alaska's marine ecosystems (Gulf of Alaska and Bering Sea) at its SSC and Advisory Panel meetings, as part of its annual management process for Alaskan groundfish. These are prepared and presented by NMFS scientists, and contain report cards which look at a wide range of environmental and ecosystem variables, such as physical and environmental trends, zooplankton biomass, predator and forage species biomass, and seabird and marine mammal data. Essential fish habitat is identified for managed fish species, including flatfish.
The Oil Spill Recovery Institute (OSRI) was established by US Congress in response to the 1989 Exxon Valdez oil spill. OSRI is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova, AK. The PWS Science Center facilitates and encourages ecosystem studies in the Greater Prince William Sound region. The Congressional mandate given OSRI is:

1. To identify and develop the best available techniques, equipment and materials for dealing with oil spills in the Arctic and sub-Arctic marine environment; and,
2. To complement federal and state damage assessment efforts and determine, document, assess and understand the long-range effects of Arctic and sub-Arctic oil spills on the natural resources of Prince William Sound, and the environment, the economy and the lifestyle and well-being of the people who are dependent on those resources.

Evidence Basis: Alaska's flatfish stock assessment programs (NMFS, ADFG) are extensive and comprehensive, and documented in the annual SAFE process (see references in Clause 4.1.1. above). They contain regular updates of stock status, including how each stock is positioned relative to precautionary approach reference points. Ecosystem considerations are presented in each SAFE assessment report. In addition, comprehensive Ecosystem Reports for EBS, AI, and GOA are presented to NPFMC annually (e.g. Zador et al., 2018), which look at numerous elements of the Alaskan Ecosystems. Each SAFE document for flatfish has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem.

The North Pacific Research Board (NPRB) has developed two special projects that seek to understand the integrated ecosystems of the BSAI and GOA. For example, in the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the $17.6 million GOA ecosystem study that looks at the physical and biological mechanisms that determine the survival of juvenile groundfish in the eastern and western Gulf of Alaska (NPRB, 2016).
There is also is an NPFMC study on modelling recruitment of some flatfish in the southeastern Bering Sea (Siddon et al., 2018) in relation to climatic and oceanographic patterns.

NMFS identifies habitats essential for managed species and conserves habitats from adverse effects on those habitats. These habitats are termed "Essential Fish Habitat" or EFH, and are defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". NMFS and NPFMC must describe and identify EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH (see NPFMC EFH http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/).

OSRI produces an annual report (OSRI 2018), among other publications. The 2018 report contains details on their activities, including ongoing research projects, an update of field guide for oil spill response in arctic waters, and shore-zone mapping of the eastern Aleutian Islands.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPBR, 2016. NPRB GOA project http://www.nprb.org/gulf-of-alaska-project/preliminary-final-results/

Siddon et al., 2018. https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/ecosysEBS.pdf

OSRI 2018. http://www.pws-osri.org/wp-content/uploads/2019/02/FY18-Annual-report.pdf

Zador et al., 2018. https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/ecosysAI.pdf

Non-Conformance Number (if relevant):

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

FAO 12.*7*

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in all parameters.**	There is **insufficient** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in two parameters.**	There is **moderate** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in one parameter.**	Management organizations cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Fulfils all parameters.**

Evaluation Parameters
Process: There is cooperation or interaction between international organizations to ensure optimum utilization of resource.
Current Status/Appropriateness/Effectiveness: There is evidence available to substantiate that such cooperation or interaction has taken place. There is data available that substantiates cooperation activities.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)/:

Process: USA cooperates through relevant international organizations such as PISCES to encourage

research in order to ensure optimum utilization of all fishery resources. Although the fishery for flatfish is conducted entirely within the US EEZ, there is also scientific cooperation with neighboring countries such as Canada. USA is also part of ICES, NAFO, SPRFMO and several Tuna commission.

Current Status/Appropriateness/Effectiveness: The North Pacific Marine Science Organization (PICES) is an intergovernmental scientific organization, was established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, People's Republic of China, Republic of Korea, the Russian Federation, and the United States of America. Its scientific program named FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is an integrative program undertaken by the member nations and affiliates of PICES to understand how marine ecosystems in the North Pacific respond to climate change and human activities. The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off the West Coast. Representatives from Canadian and American state and federal agencies continue to meet annually to exchange information and to identify data gaps and information needs for groundfish stocks of mutual concern from California to Alaska. Not all of these are transboundary stocks (e.g. P. halibut is, P. cod is not). Each agency prepares a comprehensive annual report highlighting survey and research activities, including stock assessments. These reports are compiled into an annual TSC report that is published online. The TSC reviews agency reports and recommends collaborative work or plans workshops on topics of shared interest, such as survey methodology, tagging programs, electronic data capture, and fish ageing.

Evidence Basis: The PICES and TSC websites (see http://meetings.pices.int/members/scientific-programs andhttp://www.psmfc.org/tsc) include minutes of meetings through 2018, as well as workshop reports. NMFS scientists from Alaska (e.g. Auke Bay Laboratories) maintain collaborative ties with researchers from many international agencies and institutions (e.g. see NAFO: https://www.nafo.int/About-us/Overview-of-NAFO)

Conclusion:
Management organizations cooperate with relevant international organizations (e.g. US-Canada Governments) to encourage research in order to ensure optimum utilization of fishery resources.

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments

Non-Conformance Number (if relevant):

NOT APPLICABLE

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

FAO CCRF 12.7, 12.17

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** development of collaborative technical and research programs to improve understanding of the biology, environment and status of	There is **insufficient** development collaborative technical and research programs to improve understanding of the biology, environment and status of	There is **moderate** development of collaborative technical and research programs to improve understanding of the biology, environment and status of	The fishery management organizations directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment

transboundary aquatic stocks. **Lacking in all parameters.**	transboundary aquatic stocks. **Lacking in two parameters.**	transboundary aquatic stocks. **Lacking in one parameter.**	and status of transboundary aquatic stocks. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if stock in not transboundary in nature.
Process: The collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks have been developed.
Current Status/Appropriateness/Effectiveness: There is evidence available to substantiate that such cooperation or interaction has taken place. There are data on such collaborations for transboundary aquatic stock understanding.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)/:

The U.S. and Russia both consistently publish management data (TACs, catch data) and are both signers of the Agreement on Mutual Fisheries Relations (first signed in 1988) for conservation, management and optimal utilization of shared fisheries resources between both nations. The agreement is not specific to flatfish alone, but does call for cooperation, shared science, conservation and management of fisheries resources. It identifies combating global Illegal Unreported and Unregulated (IUU) fishing as the first of three major areas of future cooperation.

However, during the site visit was evidenced that flatfish stocks are not transboundary in nature. Therefore, the present clause is not applicable.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	None ☐	None ☐

References:
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/us_russia.html

http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf

Non-Conformance Number (if relevant):

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

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** analysis of research data, or publication of that data in a way that ensures confidentiality, where appropriate. **Lacking in all parameters.**	There is **insufficient** analysis of research data or publication of that data in a way that ensures confidentiality, where appropriate.	There is **moderate** analysis of research data, or publication of that data in a way that ensures confidentiality, where appropriate.	Data generated by research is analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where

	Lacking in two parameters.	**Lacking in one parameter.**	appropriate. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.
Current Status/Appropriateness/Effectiveness: There is evidence data was properly analyzed. Data was published respecting, where appropriate, confidentiality agreements. The rules of confidentiality are effectively respected.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.

Evaluation (per parameter)/:

Process: There is a well-defined public process, coordinated by NPFMC, NFMS, and ADFG that allows extensive analysis of research and relevant commercial fisheries data, ensuring their confidentiality when necessary.

Current Status/Appropriateness/Effectiveness: As documented in some previous clauses, extensive scientific data from various sources are analysed and presented in peer reviewed meetings and/or in primary literature, following scientific protocols. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on websites of various agencies, in order to contribute to flatfish fisheries conservation and management. Confidentially is required by Alaska statute and data is redacted in reports when necessary.

Evidence Basis: The AFSC has a strong publication record in both peer reviewed scientific journals as well as reports to industry and the relevant management authorities e.g. NPFMC.
Numerous articles are published in peer reviewed journals covering all aspects of marine and environmental science (see http://www.afsc.noaa.gov/Publications/default.htm)
Individual divisions of NMFS also upload recent publications on their relevant web pages.
With regards to the publication of data that could be considered commercially sensitive, AFSC policy is to aggregate data to the level of at least three producers e.g. vessels.
NOAA administrative order 216-100 prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by the NMFS. Confidential data are those identifiable with a person. Before release to the public, data must be aggregated to protect the individual identities. For fisheries data, this requires that there must be at least 3 entities contributing to any level of aggregated data. Only authorized users have access to confidential data, they must have a need to collect or use these data in the performance of an official duty, and they must sign a statement of nondisclosure affirming their understanding of NMFS obligations with respect to confidential data and the penalties for unauthorized use and disclosure. Confidential data must be maintained in secure facilities. Data collected by a contractor, such as an observer contractor, must be transferred timely to authorized Federal employees; no copies of these data may be retained by the contractor. NMFS may permit contractors to retain aggregated data. A data return clause shall be included in the agreement. All procedures applicable to Federal employees must be followed by contractor employees collecting data with Federal authority. Under agreements with the State, each State data collector collecting confidential data will sign a statement at least as protective as the one signed by Federal employees, which affirms that the signer understands the applicable procedures and regulations and the penalties for unauthorized disclosure (see http://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf).

In addition, a memorandum of agreement was signed in September 1999 between the NOAA, ADFG and the Alaska Commercial Fishery Entry Commission (CFEC). The purpose of this agreement is to outline the understanding between the NOAA, U.S. Department of Commerce (DOC), ADFG and the CFEC, regarding reciprocal provision of direct access to, and subsequent storage and usage of, confidential data regarding marine fisheries in and off Alaska, such as fishery landings data and port sampling data (see https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=2ahUKEwjWyru95pPjAhV

SIMUKHRrAAaQQFjABegQIAxAC&url=https%3A%2F%2Fwww.adfg.alaska.gov%2Fstatic-f%2Fhome%2Fpdfs%2Fcfec_program_review_appendices.pdf&usg=AOvVaw3wjqKnHZsvslym_KWFW1iH).

Conclusion:
NMFS publishes the results of Alaskan flatfish complex fisheries data analysis (SAFE reports) in a way that confidentiality is respected where appropriate (NOAA administrative order 216-100, memorandum of agreement signed between the NOAA, ADFG and the Alaska Commercial Fishery Entry Commission).

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2017.
http://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf

Non-Conformance Number (if relevant):

C. The Precautionary Approach

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

FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2-29.2bis, 29.6, 30-30.2
FAO Eco (2011) 36.2, 36.3, 37, 37.1, 37.2

6.1 States shall establish safe target reference point(s) for management.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No safe target reference points have been established. **Lacking in all parameters.**	Target reference points have been established but considered **insufficiently** safe. **Lacking in two parameters.**	Target reference points have been established but considered **moderately** safe. **Lacking in one parameter.**	Target reference points have been established and are consistent with achieving MSY. **Fulfils all parameters.**

Evaluation Parameters
Process: A target reference point(s) or proxy has been officially established. Managers shall be able to apply technical measures to reduce fishing pressure in the event that reference points are approached or exceeded.
Current Status/Appropriateness/Effectiveness: The official target reference point or proxy is consistent with achieving maximum sustainable yield (MSY) or a suitable proxy, and there is evidence that it has been used as an objective by the management process. If there are historical instances of the reference point being approached or exceeded, managers have taken remedial action as appropriate. In the context of reference points, when data are insufficient to estimate reference points directly other measures of productive capacity can serve as reasonable substitutes or "proxies". Suitable proxies may be, for example, standardized cpue as a proxy for biomass or specific levels of fishing mortality and biomass which have proven useful in other fisheries and can be used with a reasonable degree of confidence in the absence of better defined levels. It is important to note that the use of a proxy may

involve additional uncertainty, and if so, should trigger the use of extra precaution in the setting of biological reference points.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/:

Process: 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. Target reference points for biomass and fishing mortality (harvest rate) have been developed for several stocks, including flatfish, within the NPFMC precautionary approach management system based on sound scientific analyses. In addition, an optimal yield reference point has also been established for each sum of all yields in the GOA and BSAI. Managers can apply technical measures to reduce fishing mortality if reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness: The status of US fish stocks is determined by 2 metrics. The first is the relationship between the actual exploitation level and the overfishing level (OFL). If the exploitation level (or fishing mortality) exceeds the FOFL, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the minimum stock size threshold (MSST). If the stock size is below the MSST it is considered to be overfished. A stock is considered to be approaching an overfished condition when it is projected that there is more than a 50% chance that the biomass of the stock or stock complex will decline below the MSST within 2 years. Harvest specifications for each of the P. cod stocks are made annually by NPFMC, and include the OFL, acceptable biological catch (ABC), and total allowable catch (TAC). The NPFMC management plans classify each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. The Tier system specifies the maximum permissible ABC and the OFL for each stock in the complex (usually individual species but sometimes species groups). The BSAI and GOA groundfish fishery management plans have pre-defined harvest control rules (HCR) that define a series reference points for groundfish covered by these plans. The overall objectives of the management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty. In Tiers 1–3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. Most of the larger and commercially important stocks under NPFMC management are in Tier 3, which has sufficient information to determine surrogates for MSY-based reference points. The term "*FX%*" refers to the fishing mortality rate (*F*) associated with an equilibrium level of spawning per recruit equal to *X%* of the equilibrium level of spawning per recruit in the absence of any fishing. For tier 3, the term *B40%* refers to the long-term average biomass that would be expected under average recruitment and *F=F40%*. These 2 metrics can thus be considered as targets. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so although MSY cannot be estimated with confidence, the MSY proxy level is defined as B35% and the MSST level is one-half of B35%. Note that Tier 3 is split into 3 components, based on biomass level, and that the harvest control rule specifies a decline in fishing mortality when the stock biomass drops below the target level of B40% rather than at B35%. The state flatfish fisheries are managed by ADFG and BOF using an annual Guideline Harvest Level (GHL).

Tier 1 Information available: reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY} .

1a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = mA$, the arithmetic mean of the pdf

1b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = mA \times (B/B_{MSY} - \alpha)/(1 - \alpha)$

1c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

Tier 2 Information available: reliable point estimates of B, B_{MSY} , F_{MSY} , $F_{35\%}$, and $F_{40\%}$.

2a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = F_{MSY}$

2b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = F_{MSY} \times (B/B_{MSY} - \alpha)/(1 - \alpha)$

2c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

Tier 3 Information available: reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$F_{OFL} = F_{35\%}$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$F_{OFL} = 0$

Tier 4 Information available: reliable point estimates of B, $F_{35\%}$, and $F_{40\%}$.

$F_{OFL} = F_{35\%}$

Tier 5 Information available: reliable point estimates of B and natural mortality rate M.

$F_{OFL} = M$

Tier 6 Information available: reliable catch history from 1978 through 1995.

OFL = the average catch from 1978 through 1995, unless an alternative value is established by the SSC on the basis of the best available scientific information

The above text table, taken from the NPFMC FMP for BSAI Groundfish, shows the tier system and harvest control rules used to determine FOFL. A similar table exists for FABC calculation in the FMP, and the portion relevant to Tier 3 stocks is as follows:

Tier 3 Information available: reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$maxF_{ABC} = F_{40\%}$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$maxF_{ABC} = F_{40\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$maxF_{ABC} = 0$

Evidence Basis: The BSAI and GOA groundfish FMPs (see NPFMC GOA FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf and NPFMC BSAI FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf) contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the reference points. Extensive analysis (e.g. a series of standard projections) is conducted in each stock assessment to determine the current and projected biomass level relative to the MSY-based target reference points. Spawning biomass projected for 2019 flatish stocks (Tier 3a all with the exception of BSAI North rock sole and BSAI Yellofin sole, which are 1a) were above the B40% reference point. Based on the information in the 2018 SAFE documents, none of the flatfish stocks had overfishing occurring, as per the standard definitions applied to each stock (see 2018 SAFE report in reference). For the Tier 1 and 3 stocks (EBS and GOA), the additional determinations could be made that neither stock was overfished, or approaching an overfished condition.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
2018 SAFE reports
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

6.2 States shall establish safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions should be taken to decrease the fishing mortality (or its proxy) below that limit reference point.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No safe limit reference points for exploitation have been established. **Lacking in all parameters.**	Limit reference point is established but considered **insufficiently** safe, and measures taken are **insufficient** to ensure that it will not be exceeded. **Lacking in two parameters.**	Limit reference point is established but considered **moderately** safe, and measures taken are **moderate** to ensure that it will not be exceeded. **Lacking in one parameter.**	There are established safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures are taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. **Fulfils all parameters.**

Evaluation Parameters

Process: A scientifically based limit reference point or proxy has been officially established, together with the measure to be taken to ensure it will not be exceeded.

Current Status/Appropriateness/Effectiveness: The stock under assessment shall not currently be overfished (as defined by the competent Alaska authorities) according to the best available scientific understanding. The stock is currently estimated to be on the sustainable side of this reference point (e.g. SSB is above limit reference point, F is below F_{lim}, etc.). The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. There are mechanisms in place (e.g. harvest control rule or mechanism) to ensure that the level of fishing pressure is reduced if the limit reference point is approached or reached, and these mechanisms are consistent with ensuring to a high degree of certainty that the limit reference point will not be exceeded and that actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. The level of Blim should be set on the basis of historical information, applying an appropriate level of precaution according to the reliability of that information. In addition, an upper limit should be set on fishing mortality, Blim, which is the fishing mortality rate that, if sustained, would drive biomass down to the Blim level It is important to clarify that for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska and scored accordingly within the assessment.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/:

Process: 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. If the exploitation level (or fishing mortality) exceeds the FOFL limit, the stock is considered to be subject to overfishing. If the stock size is below the MSST threshold it is considered to be overfished, and a rebuilding plan is called for. Limit reference points for biomass and fishing mortality (harvest rate) have also been developed for flatfish within the NPFMC precautionary approach management system based on sound scientific analyses. An optimal yield (OY) reference point has also been established for each sum of all yields in the GOA and BSAI. Managers can apply technical measures to reduce fishing mortality if reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness: In the NPFMC tier system, the flatfish stocks both in BSAI and GOA are currently managed under Tier 3 (only 2 under 1a). Stocks in tier 3 are further categorized as (a), (b), or (c) based on the relationship between biomass, B40%, and a lower biomass limit, as indicated in the table in Clause 6.1. The category assigned to a stock determines the method used to calculate Acceptable Biological Catch (ABC) and OFL. The harvest control rule is biomass-based, for which fishing mortality is constant when biomass is above the B40% target and declines linearly down to the threshold value when biomass drops below the target, consistent with the precautionary approach. Below the limit specified in Tier 3c, the fishing mortality rate (FOFL) used to set the OFL is set to zero. The rule used to determine the ABC is applied in exactly the same manner, i.e. based on a harvest control rule triggered by targets and limits, and below the limit, maxFABC (fishing mortality) is set to zero. Note that the MSST threshold used to determine if a stock is overfished is a different reference point than those used in the NPFMC tier system. An incorrect interpretation of this reference point relative to the HCR in the NPFMC tier system was presented in Clause 6.1 of the previous RFM surveillance audit for this stock. NPFMC Groundfish FMPs for GOA and BSAI Regions also define a B20% threshold as follows: "For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed fishing is prohibited in the event that the spawning biomass of such a species is projected in the stock assessment to fall below *B20%* in the coming year".

Evidence Basis: The BSAI and GOA groundfish fishery management plans referenced above contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the limit and target reference points. Most of the GOA and BSAI flatfish are in tier 3a (biomass > B40%). For the Tier 3 stocks, projections carried out with various harvest scenarios are conducted in each stock assessment to determine the current and projected biomass level relative to the limit reference points. Based on the information in the 2018 SAFE documents (i.e. position of the current and projected stock size relative to reference points), none of the GOA or BSAI stocks were below the limit reference points for biomass

(B35% for Tier 3 stocks and BMSY for Tier 1), and thus were not overfished, were not approaching an overfished condition, and F was below FOFL and thus did not have overfishing occurring. The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. The NPFMC FMPs state that if a stock is determined to be overfished, an FMP amendment or regulations will implemented to rebuild the stock or stock to the MSY level within a specified time period. This would include determining an FOFL and FMSY that will rebuild the stock within an appropriate time frame.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

6.3 Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration shall not be overfished (i.e. above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing.

FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2-29.2bis, 29.6, 30-30.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** measurement of the position of the fishery in relation to the reference points exists, and maintenance of the level of fishing permitted is **not**	The measurement of the position of the fishery in relation to the reference points is carried out, but the maintenance of the	The measurement of the position of the fishery in relation to the reference points is carried out, but the maintenance of the	Data and assessment procedures are installed measuring the position of the fishery in relation to the reference points.

commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. **Lacking in all parameters.**	level of fishing permitted is **insufficiently** commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. **Lacking in two parameters.**	level of fishing permitted is only **moderately** commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. **Lacking in one parameter.**	Accordingly, the stock under consideration is not overfished (i.e. it is above limit reference point or proxy) and the level of fishing permitted is commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing. **Fulfils all parameters.**

Evaluation Parameters
Process: Data and assessment procedures (i.e. stock assessment process) are in place to measure the position of the fishery in relation to the target and limit reference points.
Current Status/Appropriateness/Effectiveness: The current status of the stock in relation to reference points, is used to determine the level of fishing permitted, to ensure the latter is commensurate with the current state of the fishery resources (i.e. close to or above target reference point and most importantly, not overfished or below its limit reference point or proxy) taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing. The stock shall be ideally positioned above the midway point between target and limit reference point. It is important to clarify that, for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per Evaluation (per parameter)/:

Evidence Basis:
Process: NMFS/NPFMC has an extensive peer reviewed stock assessment program, which is necessary to monitor and measure the status of the flatfish stocks relative to target and limit levels of exploitation and biomass. Extensive oceanographic monitoring and ecosystem modelling is done on stocks in Alaskan waters as part of a number of projects, in order to monitor and predict changes of stock productivity.

Current Status/Appropriateness/Effectiveness: Each 2018 SAFE report for flatfish stocks describes the current fishing mortality rate, and stock biomass relative to the target and limit reference points. NPFMC FMPs specify the Overfishing Limits (OFL) and the Fishing mortality rate (FOFL) used to set OFL, Acceptable Biological Catch (ABC), and the fishing mortality rate (FABC) used to set ABC, the determination of each being dependent on the knowledge base for each stock. The GOA and EBS stocks are well above the B35% (MSY proxy) and B40% reference points, and therefore above MSST (defined as 1/2B35%). None of these stocks is overfished, has overfishing occurring, or is approaching an overfished condition.

Extensive oceanographic monitoring is carried out in conjunction with the various surveys in Alaskan waters, as described in Clause 4. Monitoring of the Pacific Decadal Oscillation (PDO) regimes, a standard indicator of productivity in the north Pacific, is conducted, along with analyses of its potential impacts on productivity of North Pacific stocks. Annual Ecosystem Reports for BSAI and GOA are presented to NPFMC.

Bering Sea and Aleutinian islands
The current status of individual groundfish stocks managed under the FMP is summarized in this section.

Plan Team recommendations for 2019 and 2020 ABCs and OFLs are summarized in Tables in background material. Overall, the status of the stocks continues to appear favorable. Nearly all stocks are above BMSY or the BMSY proxy of B35% (Figure 16). The abundances of all flatfishes managed under Tiers 1 or 3 are projected to be above BMSY or the BMSY proxy.

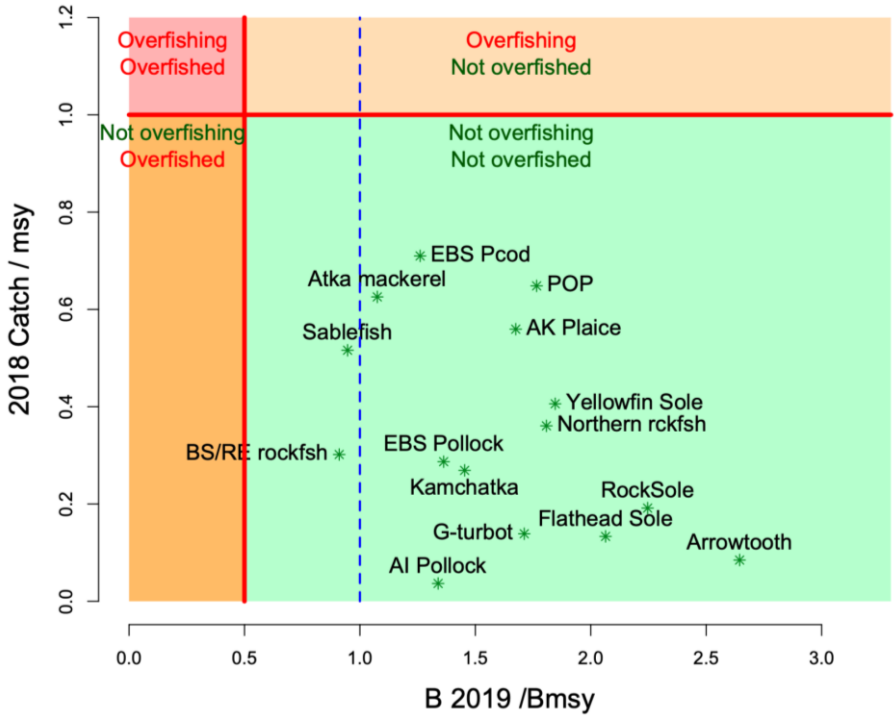


Figure 16 Summary of Bering Sea stock status next year (spawning biomass relative to Bmsy; horizontal axis) and current year catch relative to fishing at Fmsy (vertical axis) where FOFL is taken to equal Fmsy.

Gulf of Alaska

The status of individual groundfish stocks managed under the FMP is summarized in this section. The abundances of all flatfish stocks are above target stock size (Fig. 17).

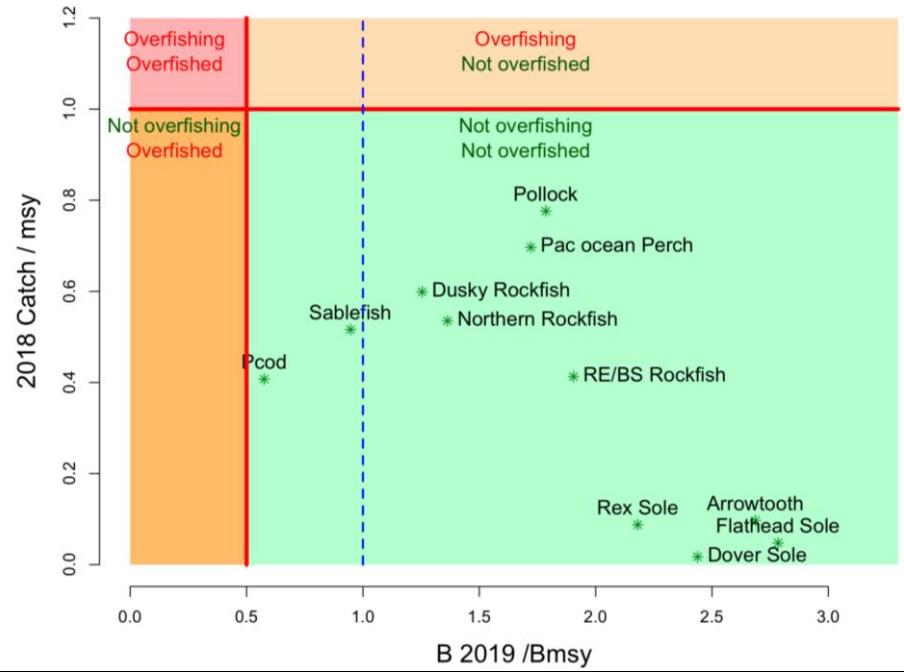


Figure 17. Summary of Gulf of Alaska stock status next year (spawning biomass relative to BMSY; horizontalaxis) and current year catch relative to fishing at FMSY (vertical axis). Note that sablefish is for Alaska-wide values including the BSAI catches.

Evidence Basis: The SAFE documents provide full analyses of the status of flatfish stocks relative to all available reference points. The tables in Section 3.3 above, taken directly from the 2018 SAFE reports for each flatfish assessment, show the stock status in tabular form for each stock. Extensive details on the projections carried out under different harvest scenarios to determine the overfished/overfishing status for both BSAI and GOA flatfish are also contained in the SAFE documents.

In addition, comprehensive Ecosystem Reports for EBS, AI, and GOA are presented to NPFMC annually, which look at numerous elements of the Alaskan Ecosystems (see Clause 5.2 for more details). Each SAFE document for flatfish has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem.

Finally a risk classification framework for setting the ABC less than maximum permissible level is going to be implemtend in the near future also for flatfish stocks (Dorn and Zador, 2018). The table will define risk categories according to assessment-related considerations, Population dynamics considerations and environmental/ecosystem considerations. For each of these risk categories, the framework would establish guidelines for reducing the ABC from the maximum permissible. Several options could be considered, including a fixed percentage buffer that would increase (at either a faster or slower rate) as the overall risk level increased, a range of possible buffers at each risk level, or reduction in the fishing mortality rate with increasing risk.

Conclusion:
The position of the fishery and stocks in relation their assigned reference points is measured through data and assessment and made published in the yearly SAFE. Virtually all the stocks in the BSAI and GOA appear to be stable or on the rise and with conservative fishing mortalities and catches, many times more limited than allowed for from OFL, ABC and TAC recommendations. Overall the flatfish complex in Alaska appears to be lightly exploited.

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Dorn and Zador, 2018 see
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwjf6b7v_ZPjAhUMa1AKHUUrAW8QFjAAegQIARAC&url=https%3A%2F%2Fcomments.npfmc.org%2FCommentReview%2FDownloadFile%3Fp%3Db678701b-1a11-4841-b89e-

3398c51e2967.pdf%26fileName%3DWhen%2520to%2520set%2520ABC%2520less%2520than%2520Max%2520ABC%25204.pdf&usg=AOvVaw3-J0gno30JJXahG-NP9i_2
Non-Conformance Number (if relevant):

6.4 Management actions shall be agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded.

FAO CCRF (1995) 7.5.3
FAO Eco (2009) 29.6, 30.2
FAO Eco (2011) 36.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. **Lacking in all parameters.**	There is an **insufficiently** effective agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. **Lacking in two parameters.**	There is a **moderately** effective agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. **Lacking in one parameter.**	Management actions are agreed in the eventuality that data sources and analyses indicate that these reference points have been exceeded. **Fulfils all parameters.**

Evaluation Parameters
Process: There is an agreed process or system in the eventuality that the data sources and analyses indicate that these reference points have been exceeded.
Current Status/Appropriateness/Effectiveness: In the eventuality that the current level of the stock has exceeded target or limit reference point, the agreed management action (i.e., harvest control rule or framework) shall be immediately implemented and fishing reduced or halted as necessary. The harvest control rule is effective at keeping or bringing back the stock at acceptable biological levels (i.e. avoid overfishing).
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/:
Process: NPFMC has developed Harvest Control Rules (HCR) which calls for specific management actions when reference points have been exceeded.

Current Status/Appropriateness/Effectiveness: The NPFMC management of flatfish stocks includes HCR based on the reference points described in the previous 2 clauses. This HCR triggers actions by managers to reduce catches when the stock is below B40% i.e. in Tier 3b between B40% and the lower limit specified in Tier 3c, or to set FOFL to 0 when the biomass is below the limit specified in Tier 3c. If the stock is determined to be below the MSST (defined as ½ of B35%), a rebuilding plan must be established to bring the biomass back to the BMSY level within a specified timeframe.

Evidence Basis: The BSAI and GOA groundfish fishery management plans referenced above contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the limit and target reference points. Extensive analysis is conducted in each stock assessment to determine the current and projected biomass level relative to the reference points, and to advise on the various catch levels appropriate to the HCRs. At present, the stocks are all well above the MSST values (not overfished), and the current ABCs for GOA and BSAI flatfish were set based on the stocks being above B40% or BMSY, i.e. in Tier 3a and 1a.
The following section on stock rebuilding is directly from the NPFMC FMP for BSAI and GOA Groundfish: Within two years of such time as a stock or stock complex is determined to be overfished, an FMP

amendment or regulations will be designed and implemented to rebuild the stock or stock complex to the MSY level within a time period specified at Section 304(e)(4) of the Magnuson-Stevens Act. If a stock is determined to be in an overfished condition, a rebuilding plan would be developed and implemented for the stock, including the determination of an FOFL and FMSY that will rebuild the stock within an appropriate time frame.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.5.1/7.5.4/7.5.5/12.3
FAO ECO (2009) 29.6/32
FAO Eco (2011) 36.7

7.1 The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. This should take due account of stock enhancement procedures, where appropriate. Absence of scientific information shall not be used as a reason for postponing or failing to take conservation and management measures. Relevant uncertainties shall be taken into account through a suitable method of risk assessment, including those associated with the use of introduced or translocated species[107].

FAO Eco (2009) 29.6
FAO Eco (2011) 36.7

Low Confidence	**Medium Confidence**	**Medium Confidence**	**High Confidence**

[107] FAO Technical Guidelines for Responsible Fisheries No.2 – Precautionary approach to capture fisheries and species introductions.

Rating (Critical NC)	Rating (Major NC)	Rating (Minor NC)	Rating (Full Conformance)
The precautionary approach is **not** applied to conservation, management and exploitation of living aquatic resources. **Lacking in all parameters.**	**The precautionary approach is insufficiently applied to conservation, management and exploitation of living aquatic resources.** **Lacking in two parameters.**	**The precautionary approach is moderately applied to conservation, management and exploitation of living aquatic resources.** **Lacking in one parameter.**	The precautionary approach is applied to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. **Fulfils all parameters.**

Evaluation Parameters
Process: There are management measures, regulations, and laws that command or direct for the use of the precautionary approach (PA) to conservation, management and exploitation of the aquatic resources under assessment. This could either take the form of an explicit commitment to the application of the PA, or could be evidenced by an over-arching approach applied throughout the management literature.
Current Status/Appropriateness/Effectiveness: There is evidence for the practical application of the PA to resource management and conservation. Note that the PA may be integrated in stock assessment practices, in specific management measures enacted for everyday fisheries operations, or other measures. Application of the PA takes in due account of stock enhancement procedures, where appropriate, and relevant uncertainties are taken into account using a suitable method of risk assessment, including those associated with the use of introduced or translocated species.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans and other documents.

Evaluation (per parameter)/:
Process: Precautionary approach-based reference points are used in the management of Alaskan flatfish stocks, and are stated in the NPFMC FMPs for the GOA and BSAI regions. Scientific information and stock assessments available are at a consistently high level, and clearly provide the necessary basis for conservation and management decisions. Uncertainties are taken into account in the stock assessment process, in the establishment of reference points, and risk assessment is used in providing harvest options.

Current Status/Appropriateness/Effectiveness: Precautionary approach-based reference points are used in the management of the flatfish stocks, as described extensively in Clause 6. The scientific information and stock assessments available (as described in Clauses 4 and 5) are at a consistently high level, and provide the necessary basis for conservation and management decisions. Scientific advice for management of the stocks is presented for different harvest levels which explains the risk of biomass levels being below the adopted reference points.

Evidence Basis: The reference points are established by the NPFMC tier system precautionary approach documented in their FMPs, and stock status is evaluated against these calculated reference points in the annual stock assessment SAFE reports. Where possible, projections are carried out as part of the stock assessments to determine future trajectories of biomass, and related risks of overfishing. There are no stock enhancement, introduced or translocated species concerns for Alaskan flatfish.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

7.1.1 In implementing the precautionary approach, States shall take into account, *inter alia*, of uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.

FAO CCRF (1995) 7.5.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is no implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions. **Lacking in all parameters.**	**There is insufficient implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions.** **Lacking in two parameters.**	**There is moderate implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as, well as environmental and socio-economic conditions.** **Lacking in one parameter.**	In implementing the precautionary approach, the State takes into account, *inter alia*, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system in place under which the potential uncertainties listed above can be examined and taken into account during the decision-making process.

Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that in the fishery under assessment, uncertainties considered include those associated with the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans and other documents.

Evaluation (per parameter)/:
Process: Potential uncertainties in the stock size, reference points, productivity, etc. are taken into account in the assessment process. Uncertainties in the management process re reference points, classification of stocks into precautionary approach tiers, setting of catch levels, etc. are explicit in the NPFMC FMPs.

Current Status/Appropriateness/Effectiveness: Scientists evaluate how fish stocks and user groups might be affected by fishery management actions. The assessments take into account uncertainty in such parameters as survey index data, mean weights at age, and stock-recruit relationship. Analyses evaluate stock status relative to reference points in a probabilistic way, and risks of exceeding reference points at current and projected stock sizes are explicitly presented in the catch option tables in each SAFE report. Extensive research on impacts of fishing, environmental factors, and socioeconomics is presented annually.

The overall objectives of the NPFMC 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 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. The harvest control rules associated with these tiers consider the uncertainty associated with each level of information. Acceptable biological catch (ABC) is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and the ABC is set below the OFL. Total allowable catch (TAC) is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty. In the NPFMC approach, TAC <= ABC < OFL.

Evidence Basis: There are numerous references and examples of how uncertainty is dealt with in the stock assessment of flatfish in the annual SAFE reports, taking into consideration that the methodologies used are Statistical Catch at Age models (in some cases implemented in SS3) which consider input parameters non-error free. In addition, the NPFMCs fishery management plans (FMPs) for groundfish in GOA and BSAI regions are explicit in how different levels of uncertainty are accounted for in the management process. Environmental data and socioeconomic data are also well documented through annual SAFE reports, as outlined in previous clauses.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

7.1.2 In the absence of adequate scientific information, appropriate research shall be initiated in a timely fashion.

FAO CCRF (1995) 7.5.1, 12.3

FAO Eco (2009) 29.6/32

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
In the absence of adequate scientific information, appropriate research is not initiated in a timely fashion. **Lacking in all parameters.**	In the absence of adequate scientific information, appropriate research is sometime initiated in a timely fashion. **Lacking in two parameters.**	In the absence of adequate scientific information, appropriate research is often initiated in a timely fashion**.** **Lacking in one parameter.**	In the absence of adequate scientific information, appropriate research is initiated in a timely fashion. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that identifies weaknesses in the scientific information available to fishery managers, and initiates additional research as necessary.
Current Status/Appropriateness/Effectiveness: There is evidence that such a process has been applied in the case of the fishery under assessment, including examples of initiated research. Depending on the situation, appropriate research or further analysis of the identified risk is initiated in a timely fashion.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or scientific reports.

Evaluation (per parameter)/:

Process: Stock assessments are reviewed on a number of levels, including externally. Where data gaps have been identified, the NMFS/AFSC and ADFG has ongoing research programs capable of addressing these needs. Organisations such as NPRB allow scientists from a number of disciplines and agencies to work collaboratively on a variety of fishery related studies in Alaskan waters, including some on flatfish.

Current Status/Appropriateness/Effectiveness: The scientific information available for the flatfish resources is of a very high standard, and include long time series of catch and fishery data, as well as multiple sources of fishery independent data. The annual NMFS/NPFMC stock assessments are of excellent quality, and are subjected to levels of peer review, including committees in NPFMC. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by 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 BSAI and GOA flatfish assessments were reviewed by external reviewers, and several recommendations from this review were incorporated into the 2018 assessment.

Evidence Basis: The CIE reviews are available on the NMFS website, and are discussed further in

Clause 5.1 above. The SAFE documents on flatfish assessment have detailed descriptions on how the CIE recommendations are dealt with in the assessment process (see http://ciereviews.org/reviewer.php). See as exampre the CIE reviews of 3 North Pacific flatfishstock assessments: Yellowfin Sole, Northern Rock Sole, and Alaska Plaice (Cieri 2018. https://www.st.nmfs.noaa.gov/Assets/Quality-Assurance/documents/peer-review-reports/2018/2018_06_Cieri_Bering_Sea_flatfish_review.pdf)

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

2018 SAFE reports

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Cieri 2018. https://www.st.nmfs.noaa.gov/Assets/Quality-Assurance/documents/peer-review-reports/2018/2018_06_Cieri_Bering_Sea_flatfish_review.pdf

Non-Conformance Number (if relevant):

7.2 In the case of new or exploratory fisheries, States shall adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should be implemented. The latter measures should, if appropriate, allow for the gradual development of the fisheries.

FAO CCRF (1995) 7.5.*4*

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
For new and exploratory fisheries, **no** procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and **no** provisions have been made for their gradual introduction and development, by	For new and exploratory fisheries, **insufficiently effective** procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and **insufficient** provisions have been	For new and exploratory fisheries, **moderately effective** procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and **moderate** provisions have been made for their gradual	In the case of new or exploratory fisheries, States adopt as soon as possible cautious conservation and management measures, including, *inter alia*, catch limits and effort limits. Such measures remain in force until there are sufficient data to allow assessment of the impact

establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in all parameters**.	made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in two parameters.**	introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in one parameter.**	of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment are implemented. The latter measures allow, if appropriate, for the gradual development of the fisheries. **Fulfils all parameters.**

Evaluation Parameters
Note. This clause is only applicable for new or exploratory fisheries.
Process: For new or exploratory fisheries there is a process that allows the immediate application of precautionary management measures and provisions, including catch or effort limits, and for the impact assessment of such fisheries on the long-term sustainability of the stocks.
Current Status/Appropriateness/Effectiveness: There is evidence for the implementation of these catch and effort limits, and other management measures including the impact assessment performed for these fisheries.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or scientific reports.

Evaluation (per parameter)/: This clause is not applicable, as fisheries for flatfish in Alaska are well established as evidenced by the fishery management plans in BSAI and GOA.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.5.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No contingency plan has been drawn up to introduce temporary management measures to ensure that fishing activity does not exacerbate serious threats to the resource	A contingency plan has been drawn up to introduce temporary management measures, but it is **insufficiently** effective to ensure that fishing activity does not exacerbate serious	A contingency plan has been drawn up to introduce temporary management measures, but it is only **moderately** effective to ensure that fishing activity does	Contingency plans are agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other

caused by natural phenomena. **Lacking in all parameters.**	threats to the resource caused by natural phenomena. **Lacking in two parameters.**	not exacerbate serious threats to the resource caused by natural phenomena. **Lacking in one parameter.**	phenomena adversely affecting the fishery resource. Such measures may be temporary are be based on best scientific evidence available. **Fulfils all parameters.**

Evaluation Parameters
Process: There is an agreed contingency plan to avoid serious threat to the resource.
Current Status/Appropriateness/Effectiveness: There is evidence of effectiveness for this contingency plan.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, regulations or other records.

Process: There are pre-agreed NPFMC harvest control rules in place to ensure overfishing does not occur on the flatfish stocks. Extensive provisions exist in the NMFS fishery regulations for in-season adjustments (e.g. gear modifications, fishery closures) where necessary to protect the resource from biological harm.

Current Status/Appropriateness/Effectiveness: Harvest control rules have been effective in controlling catch and fishing mortality for the Alaskan flatfish stocks. Stock biomasses are above reference points, and fisheries are performing well. Provisions for rebuilding plans are specified in the MSA should stock biomass drop below MSST threshold. NPFMC FMPs contain specific clauses that enable management actions when necessary, including in-season. The FMPs also note that information and data relating to stock status may become available to NPFMC during the course of a fishing year which warrants in-season adjustments to a fishery. Certain changes warrant swift action by NMFS to protect the resource from biological harm by instituting gear modifications or adjustments through closures or restrictions. Other changes warrant action to provide greater fishing opportunities for the industry by instituting time or area adjustments through openings or extension of a season beyond a scheduled closure. Other in-season actions may be necessary for interim fishery closures to reduce prohibited species (e.g. halibut, chinook salmon) bycatch rates and the probability of premature attainment of PSC limits.

Evidence Basis: NPFMC FMPs contain the following specific clause: "In the event that a stock or stock complex is determined to be approaching a condition of being overfished, an in-season action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to prevent overfishing from occurring". Probability of the flatfish stocks falling below this limit is provided in the SAFE documents where possible.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf

2018 SAFE reports
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf
Non-Conformance Number (if relevant):

D. Management Measures

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

FAO CCRF (1995) 7.1.1/7.1.2/7.1.6/7.4.1/7.6.1/7.6.9/12.3
FAO Eco (2009) *29.2/29.4/30*
FAO Eco (2011) 36.2, 36.3

8.1 Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional, fisher or community sources.

FAO CCRF (1995) 7.1.1 Others 7.4.1/7.6.7

FAO Eco (2009) 29.2/29.4

FAO Eco (2011)36.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in all parameters.**	There are **insufficiently effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in two parameters.**	There are **moderately effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in one parameter.**	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, fisher or community sources. **Fulfils all parameters.**

Evaluation Parameters
Process: The process by which management measures are developed for the fishery utilizes the best available scientific evidence, including traditional sources where these are verifiable, and also considers the cost-effectiveness and social impact of potential new measures.
Current Status/Appropriateness/Effectiveness: There is evidence that the management measures in place are effective at achieving the long-term optimum yield, which is defined by the FAO as "the harvest levels for a species that achieves the greatest overall benefits, including economic, social and biological considerations". If the stock has been maintained above the limit reference point this shall be taken as evidence that management measures are effective in avoiding overfishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/:
Process: Conservation and management measures in place ensure the long-term sustainability of the resources. FMPs which are based on the Magnuson-Stevens Act have objectives to prevent overfishing and promote sustainable and equitable use of the flatfish resource. NPFMC has established a science-based precautionary approach and harvest control rule and based on the scientific assessment of the stocks, uses this approach to determine appropriate harvest levels. The process utilizes the best available scientific evidence, and considers the cost-effectiveness and social impact of any potential new measures.

Current Status/Appropriateness/Effectiveness: 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 comprehensive Precautionary Approach (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 Groundfish FMPs contain long-term management objectives for the Alaska P. cod fishery. The biomass of P. cod stocks is well above the limit reference points, and thus management measures are effective in avoiding overfishing.

The state flatfish fisheries are managed by ADFG and BOF using an annual Guideline Harvest Level (GHL) set as a percentage of the appropriate federal ABC for flatfish and regulations are spelled out by BOF. Extensive cooperation exists between federal and state authorities in assessing and managing the flatfish stocks.

Evidence Basis: The MSFCMA (NMFS 1996) sets out the standards (e.g. optimal use and avoiding overfishing) which are followed in managing the flatfish fisheries in Alaska. FMPs for the GOA and BSAI Regions spell out the precautionary approach used by NPFMC in its management. The 2018 SAFE reports document the latest scientific information and assessment of flatfish stocks, including current and projected biomass and fishing mortality, and their position relative to the reference points. Economic considerations are also contained the 2018 SAFE reports, as noted in Clause 4.6 above.

Guiding principles for the BOF state-managed fisheries can be found here (5 AAC 28.263; see BOF state-managed fisheries http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm), and includes provisions such as "conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock".

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NMFS 1996. MSFCMA http://www.nmfs.noaa.gov/sfa/magact/

2018 SAFE reports

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf

https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf

Non-Conformance Number (if relevant):

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

FAO Eco (2009) 29.2

FAO Eco (2011) 36.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Management targets are not consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators. **Lacking in all parameters.**	**Management targets are insufficiently consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Lacking in two parameters.**	**Management targets are moderately consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Lacking in one parameter.**	**Management targets are consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for the creation of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.

Current Status/Appropriateness/Effectiveness**: There is evidence of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.**
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/:
Process: NPFMC uses a multi-tier precautionary approach to management of flatfish, which includes Optimal Yield (multi-species) and MSY (single species) reference points, in the GOA and BSAI areas. The OY takes into consideration the total amount of fish that can be harvested from each area.

Current Status/Appropriateness/Effectiveness: NPFMC uses a multi-tier precautionary approach, which includes Optimal Yield and MSY reference points. For flatfish under tier 3 management, F40% and B40% can be considered as target reference points and flatfish under tier 1 management, FMSY and BMSY can be considered as target reference points. By definition, the optimum yield (OY) reference point is the amount of fish which: a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; b) is prescribed as such on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery.

Within Alaskan state waters, ADFG permits a 'parallel fishery' (see ADFG Commercial Fisheries

http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherygroundfish.main) where the state allows fishing against the federal TAC. The state-managed flatfish resources also use a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey and ABC for the area. Although there is not a full suite of reference points for the flatfish fisheries in state waters, there are guideline objectives and management measures in place, and the state fisheries appear to be well managed, also considering the low amount of catches in stated waters.

Evidence Basis: For GOA and BSAI flatfish, biomass in 2019 for all stocks are considered to be above B40% or BMSY. OY is given as a range for the groundfish complexes in the BSAI and the GOA, and the sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. To prevent overfishing, NPFMC management objectives include the following measures specific to Optimum Yield: Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield; 2) continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries; and 3) provide for adaptive management by continuing to specify optimum yield as a range.

There are a number of SSL protection measures in place in various locations throughout BSAI and GOA, implemented by NMFS, including areas closed to flatfish fishing for trawl and non-trawl gears.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

ADFG Commercial Fisheries
http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherygroundfish.main
NPFMC BSAI FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC GOA FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.7

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact. **Lacking in all parameters.**	There is **insufficient** evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact. **Lacking in two parameters.**	There is **moderate** evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact. **Lacking in one parameter.**	In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered. **Fulfils all parameters.**

Evaluation Parameters
Process: The process by which management measures are developed for the fishery allows for consideration of the cost-effectiveness and social impact of potential new or modified management measures.
Current Status/Appropriateness/Effectiveness: There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/:

Process: NPFMC FMPs for Alaskan groundfish recognize the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. The CDQ program exists to allocate a portion of allowable catches to coastal communities in Alaska. Industry has taken a number of measures which have led to elimination of the "race for fish" and improved cost effectiveness.

Current Status/Appropriateness/Effectiveness: The NPFMC FMPs include a substantial section on the economic and socioeconomic characteristics of the fisheries and communities in Alaska. There is a detailed annual SAFE report on economic status of Alaskan fisheries. Harvest levels for each groundfish species or species group that are set by the Council for a new fishing year are based on the best biological, ecological, and socioeconomic information available, and follow a rigorous and public peer-reviewed process.

The AFA affected the Alaskan fishing industry through overall capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish, and higher valued products. Amendment 80 went into effect in 2008 and divided groundfish target quotas and bycatch limits among cooperatives such as the Alaska Seafood Cooperative, AKSC (see Alaska Seafood Cooperative homepage http://alaskaseafoodcooperative.org/). A number of cooperatives and coalitions have formed, such as the Freezer Longline Coalition (FLC). Their stated mission is to promote public policy that facilitates the intelligent and orderly harvest of Pacific cod and other groundfish as flatfish species in the BS, AI and GOA, to encourage the reduction of waste and improvement of resource utilization in the longline fishery, to encourage the reduction of incidental catch of non-target species in the longline fisheries, to support research and public education about the longline fisheries, and to represent longline fishery interests in matters concerning the management and regulation of the longline fishery with respect to target species and protected resources. The FLC is a non-profit corporation that represents the owners and operators of the vessels that participate in the freezer longline, or catcher processor hook-and-line sector of the Pacific cod fishery in the federal waters of the BSAI and GOA Regions. The cooperatives that formed, e.g. the Alaska Seafood Cooperative, operate under a catch share program that allocates fixed amounts of Pacific cod, and other species in GOA and BSAI to the Cooperative. In return the fleet agreed to increase the amount of fish retained, to reduce bycatch and to promote sustainable fishing practices. By ending the race for fish and working cooperatively, the fleet now harvest more fish with fewer tows by targeting areas of high abundance.

The Western Alaska Community Development Quota (CDQ) Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery.

In 1995, the NPFMC adopted the Alaska Licence Limitation (LLP). The intent of the program has been to use fishing track record to rationalise the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licences.

Evidence Basis: More information on AFA can be found here https://alaskafisheries.noaa.gov/fisheries/AFA , while details were presented earlier on CDQ and LLP (see Clause 3.2.1). NMFS has numerous reports on the performance of the vessel cooperatives, including sections in the annual economic SAFE document (Fissel et. al 2019) noted previously. Information on the Freezer Longline Coalition (see Freezer Longline Coalition homepage http://www.freezerlonglinecoalition.com/index.html) and catcher vessel intercooperative reports can also be found on the NMFS website (see Cooperative reports https://alaskafisheries.noaa.gov/sites/default/files/reports/cvintercoop2018.pdf). Cooperatives have reported that with no "race for fish", retention rates have increased, and bycatch rates have fallen.
The NMFS in 2019 is exchanging yellowfin sole Community Development Quota (CDQ) for rock sole CDQ Acceptable Biological Catch (ABC) reserves in the Bering Sea and Aleutian Islands management area according to James W. Balsiger, Administrator, Alaska Region, NMFS. This action is necessary to provide opportunity for harvest of the 2019 total allowable catch (TAC) of rock sole by the Aleutian Pribilof Islands Community Development Association consistent with the goals and objectives of the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area.
This action decreases the TAC and CDQ reserves and increases the CDQ ABC reserve for yellowfin sole by 400 metric tons (mt) and increases the TAC and CDQ reserves and decreases the CDQ ABC reserve for rock sole by 400 mt. This information bulletin only provides notice of a fishery management action.

For the purposes of complying with any requirements of this action, you are advised to see the actual text of the action in the Federal Register (see https://www.fisheries.noaa.gov/bulletin/exchange-flatfish-reserves-community-development-quota-and-total-allowable-catch-1)

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Fissel et al., 2019. This report will be available at: http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf
AKSC 2017, Alaska Seafood Cooperative homepage http://alaskaseafoodcooperative.org/
NPMFC 2017. NPFMC CDQ Program http://www.npfmc.org/community-development-program/
NOAA 2017. NOAA LLP https://alaskafisheries.noaa.gov/fisheries/llp

Non-Conformance Number (if relevant):

8.1.3 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.

FAO CCRF (1995) 7.4.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Studies are **not** promoted on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in all parameters.**	There is **insufficient** promotion of studies on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in two parameters.**	There is **moderate** promotion of studies on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in one parameter.**	Studies are 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. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a need and a process that allows, as appropriate, for studies to understand the costs, benefits, and effects of alternative management options designed to rationalize fishing.
Current Status/Appropriateness/Effectiveness: There is evidence for studies conducted on of alternative management options designed to rationalize fishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various evaluation or reports on fishing rationalization.

Process: Amendment 80 was approved by NPFMC in June of 2006, and enabled the formation of fishery cooperatives for trawl catcher/processors (CPs) that are not eligible under the American Fisheries Act (AFA) to participate in directed pollock fisheries. In addition to allowing a cooperative for the AM80 CPs, AM80 also resulted in a separate Trawl Limited Access (TLA) fishery for yellowfin sole, Pacific cod, and Atka mackerel in BSAI.

Current Status/Appropriateness/Effectiveness: Mechanisms have been established to reduce capacity to levels commensurate with sustainable use of the flatfish resource in Alaska. These include

harvest control rules on the catch and effort management side, a license limitation program, and reduction of the number of vessels through industry-based initiatives. The industry-based measures have been taken to rationalize effort, eliminate derby-style fisheries, improve retention and utilization and reduce bycatch, and include the formation of groundfish cooperatives under Amendment 80. Some goals of Amendment 80 include reduction of by-catch and further rationalization of the fishery.

Evidence Basis: The Amendment 80 program was implemented in 2008 for certain groundfish catcher/processors in the Bering Sea/Aleutian Islands (BSAI) and provides an allocation of six groundfish species including yellowfin sole. As well, the freezer longline fleet in the BSAI Region formed a voluntary cooperative (the Freezer Longline Conservation Cooperative or FLCC) in 2010, in an attempt to maximize the value of their allocation of flatfish. The number of active vessels in this fleet was stable between 2003 and 2009 at an average of approximately 39 vessels, but after the formation of the FLCC, only approximately 29-30 vessels continued to fish in 2011-2014. NPFMC regularly reviews the effectiveness of measures such as Amendment 80, and a detailed five year review was prepared in 2014 by Northern Economics for NPFMC
(see https://npfmc.legistar.com/View.ashx?M=F&ID=3300713&GUID=DB925E16-602F-41BD-8690-8156BEC4FB82).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Fissel et al., 2019. This report will be available at:
http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf

NPFMC 2018. https://npfmc.legistar.com/View.ashx?M=F&ID=3300713&GUID=DB925E16-602F-41BD-8690-8156BEC4FB82

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.4.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in all parameters.**	There is **insufficiently** effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in two parameters.**	There is **moderately** effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in one parameter.**	The State prohibits dynamiting, poisoning and other comparable destructive fishing practices. **Fulfils all parameters.**

Evaluation Parameters
Process: There are management measures, or regulations, or laws that prohibit destructive fishing practices.
Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and enforcement data.

Evaluation (per parameter)/:
Process: Management regulations prohibit destructive fishing practices.

Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices, and there is no evidence that these practices are being used.

Evidence Basis: As listed in the NPFMC FMPs and NMFS regulations, the only legal gears for taking flatfish in the Alaskan fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such practices are being used illegally (see NOAA/NMFS Fishery regulations for Alaska https://alaskafisheries.noaa.gov/fisheries-679regs)

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2018. https://www.fisheries.noaa.gov/rules-and-announcements/notices-and-rules?title=&management_area%5BAlaska%5D=Alaska&field_species_vocab_target_id=&sort_by=field_relevant_date_value

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.1.2, 7.1.6, 7.6.6

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No attempts have been made to identify and consult with domestic parties (giving due recognition 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) having a legitimate interest in the use and management of fisheries resource. **Lacking in all parameters.**	**Insufficient** attempts have been made to identify and consult with domestic parties (giving due recognition 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) having a legitimate interest in the use and management of fisheries resource. **Lacking in two**	**Moderate** attempts have been made to identify and consult with domestic parties (giving due recognition 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) having a legitimate interest in the use and management of fisheries resource. **Lacking in one**	States seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation and management of the resource, due recognition is given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements are made to consult all the interested parties and gain their collaboration in

	parameters.	**parameter.**	achieving responsible fisheries. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for identifying and consulting with domestic parties (giving due recognition 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) having a legitimate interest in the use and management of fisheries resource.
Current Status/Appropriateness/Effectiveness: In accordance with national laws and regulations, there is evidence that domestic parties having a legitimate interest in the use and management of the fishery (as described above) have been identified and encouraged to collaborate in the fisheries management process.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and meeting records.

Evaluation (per parameter)/:
Process: NPFMC and BOF have processes in place to allow for identifying and consulting with domestic parties having interest in the Alaskan flatfish fisheries.

Current Status/Appropriateness/Effectiveness: The NPFMC is responsible for allocation of the flatfish resource among user groups in Alaskan waters. In addition, the Alaskan Board of Fisheries (BOF) public meeting process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities that catch flatfish off Alaska to participate in the development of legal regulations for fisheries. Organisations and individuals involved in the fishery and management process have been identified. The Alaska flatfish management process has many stakeholders, including processors, fishermen's organizations, cooperatives, coalitions, the states of Alaska, Washington, and Oregon, 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 the 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 established a Rural Outreach Committee in 2009 to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. The Committee is to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; to provide feedback on community impacts sections of specific analyses, if requested; and to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. Initial priorities of the Committee included PSC reduction. Management actions taken to reduce salmon by-catches in a number of fisheries also explicitly acknowledge the importance of the salmon resources to the individuals and communities reliant on them.

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

Advisory Committees (AC) are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries

related activities. Currently, there are 84 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BOF meetings.

Evidence Basis: Details on the NPFMC Rural Outreach Committee can be found here http://www.npfmc.org/committees/rural-outreach-committee/. The CDQ information is on the NPFMC website
NPFMC CDQ Program http://www.npfmc.org/community-development-program/. The enabling statute for the Advisory Committees system is AS 16.05.260. Regulations governing the AC are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97. More information on BOF and ADFG advisory process can be found here BOF/ADFG Advisory process http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NPFMC 2018. http://www.npfmc.org/committees/rural-outreach-committee/
NPFMC 2018. NPFMC CDQ Program http://www.npfmc.org/community-development-program/
ADFG 2018. ADFG Advisory process http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory

Non-Conformance Number (if relevant):

8.4 Mechanisms shall be established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. Fleet capacity operating in the fishery shall be measured and monitored. 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.

FAO CCRF (1995) 7.1.8, 7.6.3, 8.1.2, 8.1.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are **not** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in all parameters.**	There is **insufficient** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are **insufficiently** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in two parameters.**	There is **moderate** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are **moderately** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in one parameter.**	There is collection of measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing

operations.
Research has been conducted to determine or estimate the fishing capacity commensurate with the sustainable use of the resource. There are mechanisms in place to measure the total fishing capacity within the Unit of Certification, and to reduce this capacity if it is determined to exceed the sustainable level.
Current Status/Appropriateness/Effectiveness: There is evidence of the size of fleet capacity and of data describing fishing operation and that the mechanisms described above are successful at maintaining the effective fishing capacity of the Unit of Certification at a level commensurate with the sustainable use of the resource. Management mechanisms which restrict the application of fishing capacity, such as quotas, shall be considered valid mechanisms in relation to this parameter.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include, fleet reports or other documents or reports.

Evaluation (per parameter)/:

Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. There are mechanisms in place to measure the total fishing capacity, and to reduce it if it is determined to exceed the sustainable level. 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.

Current Status/Appropriateness/Effectiveness: NPFMC, NMFS, and ADFG have determined the fishing capacity commensurate with the sustainable use of the flatfish resource, and stocks are above biomass reference points and not overfished in any way. Management mechanisms such as TACs and quota allocations, along with licence limitation and restricted access management, regulate the catch and amount of fishing effort applied to the stocks, and there is an overall OY cap in both GOA and BSAI regions which restricts the total amount of fish of all species that can be removed from these ecosystems. Fleet capacity and regularly updated data on all flatfish fishing operations are presented in the annual SAFE documents, as well as in various cooperative reports. Each cooperative is responsible for its own target catch and bycatch, and when any allocation is reached, the cooperative must stop fishing. This provides a strong incentive for cooperatives to keep bycatch rates low and to fish efficiently.

Evidence Basis: The SAFE reports (assessments and economic reports such as Fissel et al. 2019), the cooperative reports, and NPFMC Groundfish FMPs for GOA and BSAI, are all documented in several previous clauses, provide the necessary evidence. Information on the Alaska Licence Limitation Program can be found here (NOAA/NMFS Fishery regulations for Alaska https://alaskafisheries.noaa.gov/fisheries-679regs)
The fleet register for state waters is available here: www.cfec.state.ak.us/plook/#vessels

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
https://alaskafisheries.noaa.gov/fisheries-679regs
www.cfec.state.ak.us/plook/#vessels

Non-Conformance Number (if relevant):

8.5 Technical measures shall be taken into account, where appropriate, in relation to:

- fish size
- mesh size or gear
- closed seasons
- closed areas
- areas reserved for particular (e.g. artisanal) fisheries
- protection of juveniles or spawners

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in all parameters.**	**Insufficient** technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in two parameters.**	**Moderate** technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in one parameter.**	Technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Fulfils all parameters.**

Evaluation Parameters
Process: The management system has taken into account technical measures, where and as appropriate to the fishery and stock under assessment, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.
Current Status/Appropriateness/Effectiveness: Technical measures are related to sustainability objectives, ensuring sustainable exploitation of the target stock, and minimizing the potential negative impacts of fishery activities on non-target species, ETP species, and the physical environment.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various reports, fishery management plans, regulations or other.

Evaluation (per parameter)/:

Process:
fish size, fishing gear, closed seasons and areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners of flatfish.

Current Status/Appropriateness/Effectiveness: There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the flatfish fisheries, and to ensure that the resources are harvested sustainably. These include various measures to address fish size, discards, and closed seasons and areas. Specific examples include development of excluder devices for trawl gear to reduce these by-catches, and closures of large areas to protect numerous ETP species (including salmon, crab, and marine mammals). Maximum retainable amounts (MRA) are put in place to help manage bycatches in groundfish fisheries. Fishing industry groups such as cooperatives and coalitions have undertaken numerous conservation oriented measures in relation to fish size, bycatch avoidance, and product utilization.

Evidence Basis: A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs (e.g. see Tables 23 and 24). The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website (NMFS Fishery regulations for Alaska https://alaskafisheries.noaa.gov/fisheries-679regs). These regulations cover all aspects of fishing, including seasons, gear limitations, and numerous area closures. There are specific rules laid out for flatfish, permitting the use of trawl gear in certain areas only, as well as regulations on seabird

avoidance for vessels fishing with hook-and-line gear. The gear regulations also contain details on mesh sizes permitted, biodegradable panels in pot gears, types of hook and line gear allowed, etc. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round. Fishing with trawl vessels is not permitted year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area. As well, a number of closure zones for trawl gears are described in the NPFMC FMPs for GOA and BSAI. Information on the IRIU Program can be found here https://alaskafisheries.noaa.gov/sites/default/files/679b27.pdf. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaskan waters also exist (see NMFS seabird avoidance regulations https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf), and data on seabirds are collected by observers, and included in the SAFE documents.

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 in recent years (see NPFMC by-catch management in GOA https://www.npfmc.org/goa-trawl-bycatch-management/). Other industry-driven measures taken 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 (Gauvin 2013).

In 2016, NMFS reduced the maximum retainable amount (MRA) of skates using groundfish and halibut as basis species in the Gulf of Alaska (GOA) from 20 percent to 5 percent, as a necessary measure to limit the incidental catch and discards of skates in GOA groundfish and halibut fisheries (see NMFS MRA reduction https://alaskafisheries.noaa.gov/node/53467). A 5 percent MRA means the maximum amount of skates retained on board the vessel must not exceed 5 percent of the round weight of other groundfish and halibut retained onboard a vessel. Information in the 2018 SAFE reports for skate show that the skate resources in BSAI and GOA are not overfished and/or no overfishing is occurring.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Gauvin. 2013 Deck Sorting report https://alaskafisheries.noaa.gov/sites/default/files/efp12-01halibut_a80.pdf
Ormseth 2018 BSAI skate SAFE https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIskate.pdf
Ormseth 2018 GOA skate SAFE https://www.afsc.noaa.gov/REFM/Docs/2018/GOAskate.pdf

Non-Conformance Number (if relevant):

8.6 Fishing gear shall be marked in accordance with national legislation in order that the owner of the gear can be identified. Gear marking requirements shall take into account uniform and internationally recognizable gear marking systems.

FAO CCRF (1995) 8.2.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear marking systems.	There is **insufficient** gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear	There is **moderate** gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear	Fishing gear is marked in accordance with national legislation in order that the owner of the gear can be identified. Gear marking requirements take into account uniform and internationally recognizable gear marking systems.

Lacking in all parameters.	marking systems. **Lacking in two parameters.**	marking systems. **Lacking in one parameter.**	**Fulfils all parameters.**

Evaluation Parameters
Process: There is regulation for gear marking.
Current Status/Appropriateness/Effectiveness: Fixed gear is marked according to national legislation, and lost gear can be identified back to owner.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various fleet reports and regulations.

Evaluation (per parameter)/:
Process: There are NMFS regulations for gear marking in the Alaskan fisheries in GOA and BSAI.

Current Status/Appropriateness/Effectiveness: Fixed gear is marked according to regulations, which state:

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

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

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

Mobile gear such as trawl gear does not carry identifying markings and thus derelict and discarded gear cannot be traced to specific vessels. However, the loss of such gear is very seldom and when it occurs, it is promptly retrieved, given its economic value.

Evidence Basis: Regulations pertaining to vessel and gear markings in the flatfish fishery are established in NMFS and ADFG regulations, e.g. as prescribed in the annual management measures published in the Federal Register (see NMFS Fishery Regulations https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf). There was no evidence raised/available that indicated the marking of gear is not being followed, or is not effective.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2018. NMFS Fishery Regulations https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.10

FAO Eco (2009) 30

Low Confidence	**Medium Confidence**	**Medium**	**High Confidence Rating**

Rating (Critical NC)	Rating (Major NC)	Confidence Rating (Minor NC)	(Full Conformance)
There is **no** allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities. **Lacking in all parameters.**	There is **insufficient** allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities. **Lacking in two parameters.**	There is **moderate** allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities. **Lacking in one parameter.**	Measures are introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts are 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. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that identifies depleted stocks, resources and habitats. A depleted stock is usually a stock which had undergone overfishing. Accordingly, stock status is below limit reference point and the ability of the stock to recover has been impaired.
Current Status/Appropriateness/Effectiveness: There is evidence that where depleted or adversely affected stocks, resources and habitats have been identified, efforts have been made to ensure they are restored or allowed to recover.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws and regulations, fishery management plans, and stock assessment reports.

Evaluation (per parameter)/:
Process: The US laws governing the Alaskan flatfish fisheries are fully consistent with and supportive of a number of international laws and agreements related to fisheries management, such as the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the UN Straddling and Highly Migratory Fish Stocks Agreement, and the Convention on Biological Diversity. As noted in previous clauses, the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. NMFS and NPFMC follow a comprehensive PA (OFL, ABC, TAC, OY) to manage the federal 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 rebuilding if stocks are overfished. Specific measures protect prohibited species such as halibut, various crabs, and chinook salmon exist in the flatfish fishery regulations.

Current Status/Appropriateness/Effectiveness: None of the flatfish stocks in Alaska are classified as overfished or undergoing overfishing, and none are in a depleted state. No destructive fishing practices are allowed in GOA or BSAI which would adversely impact habitat. With regard to other resources taken in the flatfish fishery, considerable work has been done to reduce catches of species such as halibut and Chinook salmon in trawl catches, as there are concerns with the status of Chinook in many rivers.

Evidence Basis:
Considerable work on deck sorting (Gauvin 2013) has occurred in recent years in certain trawl fisheries to improve the survival rates of halibut discarded at sea (required under regulation). Numerous measures to protect SSL populations and habitat affect are implemented in the FMPs for GOA and BSAI groundfish, and some are specific to the flatfish. These are discussed in detail in Clause 8.5 above. NMFS and NPFMC must describe and identify EFH in 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 (see NPFMC EFH http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/)

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Gauvin et al. 2013 http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf
NPFMC 2018. NPFMC EFH http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/

Non-Conformance Number (if relevant):

8.8 States and relevant groups from the fishing industry shall measure performance and encourage the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that sufficiently selective as to minimize catch, waste and discards of non-target species - both fish and non-fish species and impacts on associated or dependent species. 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. Inconsistent methods, practices and gears shall be phased out accordingly.

FAO CCRF (1995) 7.2.2, 7.6.4, 7.6.9, 8.4.5, 8.5.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species. **Lacking in all parameters.**	There is **insufficient** encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species. **Lacking in two parameters.**	There is **moderate** encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species. **Lacking in one parameter.**	States and relevant groups from the fishing industry measure performance and encouragement of the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that sufficiently selective as to minimize catch, waste and discards of non-target species - both fish and non-fish species and impacts on associated or dependent species. The use of fishing gear and practices that lead to the discarding of catch are discouraged and the use of fishing gear and practices that increase survival rates of escaping fish are promoted. Inconsistent methods, practices and gears are phased out accordingly. **Fulfils all parameters.**

Evaluation Parameters
Process: The management system and relevant groups from the fishing industry have encouraged the

development of technologies and operational methods to reduce waste and discard of the target species. 'Relevant groups' includes fishers, processers, distributers and marketers. There are mechanisms in place by which the selectivity, environmental impact and cost-effectiveness of gears included in the Unit of Certification are measured.
Current Status/Appropriateness/Effectiveness: Such technologies and operational methods have been implemented. The methods in use are effective in reducing waste and discards of the target species. There is evidence that the gears used in the fishery are appropriate, in terms of selectivity, environmental impact and cost-effectiveness, as assessed by the responsible scientific authority of the fishery. Methods shall be considered successful if there is evidence that the fishery under assessment is not causing significant risk of overfishing to non-target species.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various reports, regulations or other data.

Evaluation (per parameter)/:
Process: The NPFMC/NMFS/ADFG management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to improve gear selectivity, and to reduce waste and discard of the flatfish species, such as the IRIU program, and utilization of distinct areas and time periods (seasons) to manage the fisheries. The selectivity, environmental impact and cost-effectiveness of fishing gears is measured, analysed, and monitored in a number of ways, including extensive analysis and reporting of data in the SAFE documents, the EFH work, and at-sea enforcement of regulations.

Current Status/Appropriateness/Effectiveness: Numerous technologies and operational methods have been implemented in the flatfish fisheries to reduce waste and discards of non-target species. A number of earlier studies have been carried out re halibut excluder devices in trawls, and EFPs allow deck sorting of halibut to see if survival of released halibut can be improved. Measures have been introduced to reduce or avoid Chinook salmon bycatch.

Evidence Basis:
Exempted fishing permits have been issued for deck sorting on Amendment 80 Catcher Processors to reduce halibut mortality. Reports covering some of these EFP results have been published (e.g. Gauvin 2013). Flatfish trawl fisheries are required to use trawl gear which raises the trawl sweep lines off the sea floor, reduces net size, and utilizes semi-pelagic trawl doors. This reduces benthic habitat effects and reduces fuel consumption.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Gauvin et al. 2013 http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

Non-Conformance Number (if relevant):

8.9 Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques shall be applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste.

FAO CCRF (1995) 7.2.2, 8.4.6, 8.4.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Pollution, waste, and catch by lost or abandoned gear is **not** minimized.	Technologies, materials and operational methods or measures including, to the extent	Technologies, materials and operational methods or measures including, to the extent	Technologies, materials and operational methods or measures including, to the extent practicable,

Lacking in all parameters.	practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques are **insufficiently** applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. **Lacking in two parameters.**	practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques are **moderately** applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. **Lacking in one parameter.**	the development and use of selective, environmentally safe and cost effective fishing gear and techniques are applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. **Fulfils all parameters.**

Evaluation Parameters
Process: There has been development of technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear and a system to minimize pollution, waste, catch by lost or abandoned gear.
Current Status/Appropriateness/Effectiveness: Technologies, materials and operational methods that minimize the loss of fishing gear and ghost fishing are applied whenever appropriate. Also, these measures are effective in minimizing, to the extent practicable, pollution, waste, and catch by lost or abandoned gear.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:
Process: Operational methods and gears regulated in the Alaskan flatfish fisheries minimize the loss of fishing gear, and the ghost fishing effects of lost or abandoned fishing gear are minimal.

Current Status/Appropriateness/Effectiveness: There is no ghost fishing from these forms of fishing gear in the flatfish fisheries. As well, there is minimal ghost fishing from gear loss in trawl fisheries.

Evidence Basis: NPFMC FMPs outline the allowable fishing gears allowed in the flatfish fisheries, and no gillnetting is permitted for flatfish.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2018. NMFS Fishing gear regulations
https://alaskafisheries.noaa.gov/sites/default/files/part679_all.pdf

Non-Conformance Number (if relevant):

8.10 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.

FAO CCRF (1995) 8.5.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**

Information on new developments and requirements is **not** made available to all fishers. **Lacking in all parameters.**	Information on new developments and requirements is **insufficiently** made available to all fishers. **Lacking in two parameters.**	Information on new developments and requirements is **moderately** made available to all fishers. **Lacking in one parameter.**	The intent of fishing selectivity and fishing impacts related regulations is not circumvented by technical devices and information on new developments and requirements is made available to all fishers. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulation.
Current Status/Appropriateness/Effectiveness: The adopted methods are successful and effective making known fishing regulation to the participants. Enforcement data are highlighting significant violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:
Process: Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of NPFMC, NOAA/NMFS, and ADFG, and through various meetings, mailouts, etc. Fishing gear is regulated and monitored through these agencies, and data on compliance is recorded and published.

Current Status/Appropriateness/Effectiveness: Advancements or developments in fishing gear are made widely available to fishers through websites and public meetings and other forms of communication. Use of excluder devices is generally thought not to negatively impact the selectivity of the trawls toward flatfish, and are designed not to impede escaping fish.

Evidence Basis: There is no evidence that regulations involving gear selectivity in the flatfish fisheries are being circumvented either by omission, or through the illegal use of gear technology.

Conclusion:
There is no evidence of circumvention of regulations relating to fishing selectivity and related impacts. Information from the USCG reports the flatfish complex fisheries have minimal violation rates.

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2018. NMFS Fishing gear regulations
https://alaskafisheries.noaa.gov/sites/default/files/part679_all.pdf

Non-Conformance Number (if relevant):

Not Applicable

8.11 Assessment and scientific evaluation shall be carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations. Accordingly, the effects of such introductions shall be monitored.

FAO CCRF (1995) 8.4.7, 12.11

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are **not** considered prior to its introduction. **Lacking in all parameters.**	The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are **insufficiently** considered prior to its introduction. **Lacking in two parameters.**	The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are **moderately** considered prior to its introduction. **Lacking in one parameter.**	Assessment and scientific evaluation is carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations. Accordingly, the effects of such introductions are monitored. **Fulfils all parameters.**

Evaluation Parameters
Note: this clause is not applicable if new gear has not been introduced in the past 3 years.
Process: New gear has been recently introduced on a commercial scale within the last 3 years, or there is a plan to introduce new gear in the forthcoming future.
Current Status/Appropriateness/Effectiveness: An appropriate assessment of potential risks has been carried out. There is evidence to suggest that the assessment is adequate to support habitat conservation and fishery management purposes. Additionally, there is a monitoring regime in place.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:
This clause is not applicable as no new gear has been introduced in the past 3 years.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:
NMFS 2018. NMFS Fishing gear regulations
https://alaskafisheries.noaa.gov/sites/default/files/part679_all.pdf

Non-Conformance Number (if relevant):

8.12 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.

FAO CCRF (1995) 8.5.4

Low Confidence	**Medium Confidence**	**Medium Confidence**	**High Confidence Rating**

Rating (Critical NC)	Rating (Major NC)	Rating (Minor NC)	(Full Conformance)
International cooperation is not encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. **Lacking in all parameters.**	**International cooperation is insufficiently encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer.** **Lacking in two parameters.**	**International cooperation is moderately encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer.** **Lacking in one parameter.**	**International cooperation is 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.** **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system of international information exchange to allow knowledge to be shared
Current Status/Appropriateness/Effectiveness: There is evidence for international information exchange, such as meeting records or other information.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Process: The fishery for flatfish in Alaska is conducted by US vessels only. In adjacent waters of the GOA cooperation on research and management between Canada and USA occurs as part of the science and management process. Also US is member of ICES WGFBGT.

Current Status/Appropriateness/Effectiveness: The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off the West Coast. The TSC meets annually, reviews the effectiveness of existing regulations, and allows exchange of information on the status of groundfish stocks of mutual concern and to coordinate wherever possible programs of research, such as surveys, age reading, gear research, etc.

Evidence Basis: Information on the Canada-USA cooperation, including various meeting reports, can be found in Clause 5.3. The Working Group on Fishing Technology and Fish Behaviour (WGFTFB) studies measurements and observations relating to scientific and commercial fishing gears, design and statistical methods and operations, and fish behaviour in relation to fishing (see http://www.ices.dk/community/groups/Pages/WGFTFB.aspx).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
TSC 2018. https://access.afsc.noaa.gov/pubs/posters/pdfs/pWilderbuer05_tech-subcommittee.pdf

Non-Conformance Number (if relevant):

8.13 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 behavior of target and non-target species in relation to such fishing gear as an aid for management decisions and with a view to minimizing non utilized catches**.**

FAO CCRF (1995) 8.5.3/12.10

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** standard methodologies developed for studies on fishing gear selectivity and methods been decided by States and relevant institutions involved. **Lacking in all parameters.**	There are **insufficient** standard methodologies developed for studies on fishing gear selectivity and methods been decided by States and relevant institutions involved. **Lacking in two parameters.**	There are **moderate** standard methodologies developed for studies on fishing gear selectivity and methods been decided by States and relevant institutions involved. **Lacking in one parameter.**	**States and relevant institutions involved in the fishery collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species in relation to such fishing gear as an aid for management decisions and with a view to minimizing non-utilized catches.** **Fulfils all parameters.**

Evaluation Parameters
Process: There is collaborative research into fishing gear selectivity, fishing methods and strategies.
Current Status/Appropriateness/Effectiveness: There is evidence of such research, and the results have been applied accordingly in fisheries management.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Evaluation (per parameter)/:

Process: There is considerable collaborative research into fishing gear selectivity, fishing methods and strategies in the flatfish fisheries in Alaska. Organizations involved include various fishing industry groups, NMFS, ADFG, University of Alaska, and NPRB.

Current Status/Appropriateness/Effectiveness: There are numerous measures implemented in Alaskan fisheries to minimize non-utilized catches, such use prohibition of discarding (IRIU program), use of salmon and halibut excluder devices in trawl nets, and use of streamers on longline gear to reduce seabird bycatch. Many of the studies and subsequent implementation have involved cooperative efforts between researchers at institutions in NMFS, ADFG, universities, and industry, and are introduced into regulations only after extensive testing has occurred.

Evidence Basis: As reported by Gauvin et al. (2013) in work conducted under the North Pacific Fisheries Research Foundation, salmon excluder designs have evolved considerably since experimental trials in the Bering Sea started in the fall of 2003. Design changes have been influenced by a suite of exempted fishing permit (EFP) tests and by feedback from fishermen using the various designs over the years since the EFPs started. For halibut, recent EFPs for testing of deck sorting have been allowed in order to improve survival rates of released halibut in some trawl fisheries. Further information on these studies can be found in the reports referenced in Clause 8.8 above.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Gauvin et al. 2013 http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

Non-Conformance Number (if relevant):

Not applicable

8.14 Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States shall ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.

FAO CCRF (1995) 8.11.1, 8.11.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are **no** policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **No** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in all parameters.**	There are **insufficiently** effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **Insufficient** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in two parameters.**	There are **moderately** effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **Moderate** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in one parameter.**	Policies are developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation **are observed.** **Fulfils all parameters.**

Evaluation Parameters

Note: The use of artificial structures may be appropriate for some stocks but not necessary for all. This clause may therefore not be applicable if such structures are not practical or appropriate for stocks. The use of artificial structures should be considered appropriate if one or more of the species under assessment has benefitted from the use of artificial structures in other fisheries, or if species with similar biological characteristics have benefitted from the use of artificial structures in other fisheries.

Process: There is a mechanism in place for identifying potential for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. This mechanism ensures that where artificial structures are deemed appropriate, environmental protection, safety, and navigation are considered in their application.

Current Status/Appropriateness/Effectiveness: This mechanism has been applied to the fishery

under assessment, resulting either in the conclusion that artificial structures are inappropriate or in the use of artificial structures. Care has been taken in the selection of materials to use in constructing artificial reefs, the selection of sites for their deployment and to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, data and reports.

Evaluation (per parameter)/: This clause is not applicable to flatfish.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.1.7/8.1.10/8.2.4/8.4.5

9.1 States shall enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.

FAO CCRF (1995) 8.1.7/8.4.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in all parameters.**	**Insufficiently** effective education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in two parameters.**	**Moderately** effective education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in one parameter.**	States enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs take into account agreed international standards and guidelines. **Fulfils all parameters.**

Evaluation Parameters
Process: There are implemented education programs for fishers.
Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.

Evaluation (per parameter)/:
Process: There are several available education programs for fishers.

Current Status/Appropriateness/Effectiveness: The North Pacific Fishing Vessel Owners Association (NPFVOA) 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. Captains and some officers on the larger pollock vessels require certain levels of navigational

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

Also, the University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. MAP also conducts sessions of their Alaska Young Fishermen's Summit. 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, Alaska.

Evidence Basis: NPFVOA, AVTEC , University of Alaska Sea Grant Marine Advisory Program (MAP), Fishery Industrial Technology Center (see references)

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPVOA homepage http://npfvoa.org/
AVTEC homepage http://www.avtec.edu/
UAF Sea Grant MAP http://seagrant.uaf.edu/map/fisheries/
Fishery Industrial Technology Center http://www.sfos.uaf.edu

Non-Conformance Number (if relevant):

9.2 States, with the assistance of relevant international organizations, shall endeavor to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.

FAO CCRF (1995) 8.1.10

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** education and training measures making fishers aware of the key provisions of FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	There are **insufficient** education and training measures making fishers aware of the provisions of the key FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	There are **moderate** education and training measures making fishers aware of the provisions of the key FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	States, with the assistance of relevant international organizations, endeavor to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF, as well as provisions of relevant international conventions and applicable environmental and other standards that are

Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	essential to ensure responsible fishing operations. **Fulfils all parameters.**

Evaluation Parameters
Process: There are relevant measures of the code and other applicable environmental and other standards being exposed to fishers for their training.
Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines and key CCRF principles.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.

Evaluation (per parameter)/:
Process: All regulations governing the flatfish fisheries are available on the NPFMC, NMFS, and ADFG websites, and the results of any changes are widely discussed and communicated. AKD/NMFS engages in outreach to fishers and industry personnel, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Current Status/Appropriateness/Effectiveness: All rules and regulations governing Alaskan flatfish fisheries, including those dealing with responsible fishing methods, are readily available on NMFS, NPFMC, and ADFG websites. To increase communications and understanding between the regulated users and enforcement personnel, the Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) strives to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, AKD contacts thousands of harvesters and industry personnel at organized events, including trade shows, and responded to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Evidence Basis: A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs for those two regions. These also cover legal definitions such as quota shares, IFQ's, etc. The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website (see NMFS Fishery Regulations https://alaskafisheries.noaa.gov/fisheries-679regs). These regulations cover all aspects of fishing, including seasons, gear limitations, and numerous area closures.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
AKFIN http://www.akfin.org/home/
CFEC https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

Non-Conformance Number (if relevant):

9.3 States shall, as appropriate, maintain records of fishers which shall, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws.

FAO CCRF (1995) 8.1.8

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** records kept of fishers, including	There are **insufficient** records kept of fishers,	There are **moderately** appropriate records	The State maintains, as appropriate, records of

wherever possible, qualification in accordance with their national laws. **Lacking in all parameters.**	including wherever possible, qualification in accordance with their national laws. **Lacking in two parameters.**	kept of fishers, including wherever possible, qualification in accordance with their national laws. **Lacking in one parameter.**	fishers which, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system to collect and maintain fishermen records.
Current Status/Appropriateness/Effectiveness: These records are considered accurate and effective for management purposes.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.

Evaluation (per parameter)/:
Process: There is a comprehensive system in place to collect and maintain fishermen records.

Current Status/Appropriateness/Effectiveness: Detailed data on the number and location of Alaskan fishers, vessels, permits issued, etc. can be found in the annual SAFE documentation on economics of the fishery. Certain information on Alaskan fisheries has been compiled through the Alaska Fisheries Information Network (AKFIN), although selected studies may not be publicly available as some information is confidential. Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission website. Fishermen in the state-managed fisheries must register prior to fishing and are required to keep a logbook during the fishery. Completed logbook pages must be attached to the ADFG copy of the fish ticket at the time of delivery.

Evidence Basis: Data on the number and location of Alaskan of fishers, permits issued, etc. can be found in Fissel et al. 2019. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network for Alaska Fisheries (AKFIN, see http://www.akfin.org/home/). Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's CFEC website (see CFEC https://www.cfec.state.ak.us/fishery_statistics/earnings.htm).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Fissel et al., 2019. This report will be available at:
http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf

Non-Conformance Number (if relevant):

E. Implementation, Monitoring and Control

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

FAO CCRF (1995) 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1
FAO ECO (2009) 29.5
FAO Eco (2011) 36.6

10.1. Effective mechanisms shall be established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programs, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified.

FAO CCRF (1995) 7.1.7 Others 7.7.3/8.1.1
FAO Eco (2009) 29.5
FAO Eco (2011) 36.6

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** mechanisms established for fisheries monitoring, surveillance and control. **Lacking in all parameters.**	There are **insufficiently** effective mechanisms established for fisheries monitoring, surveillance and control. **Lacking in two parameters.**	There are **moderately** effective mechanisms established for fisheries monitoring, surveillance and control. **Lacking in one parameter.**	Effective mechanisms are established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programs, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. **Fulfils all parameters.**

Evaluation Parameters
Process: There are mechanisms established for fisheries monitoring, surveillance, control and enforcement.
Current Status/Appropriateness/Effectiveness: These mechanisms are effective, and include effective observer, inspection scheme, and vessel monitoring schemes where appropriate for the type of fishery under assessment. Monitoring, surveillance, control and enforcement mechanisms can be considered effective if they are sufficiently broad to cover the entirety of the Unit of Certification, there is evidence that rules and regulations are consistently enforced, and there is no evidence of frequent or widespread violation of fishery regulations. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. With respect to fisheries in the high seas, the legal obligations of UNCLOS and UNFSA have particular relevance. Evidence of the performance of the legal framework can be derived from the assessment of conformance with requirements covering compliance and enforcement.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include rules and regulations, enforcement reports.

Evaluation:

Process:

The US Coast Guard (USCG)[108], NMFS Office of Law Enforcement (OLE)[109] and Alaska Wildlife Troopers (AWT)[110] (a Division of the Alaska Department of Public Safety) conduct at-sea and shore-based inspections.

Extensive at-sea observer coverage, dockside monitoring, aerial surveillance and satellite vessel monitoring systems (VMS) are in operation[111] within the fisheries and developmental work is on-going with respect to additional electronic monitoring (EM) technologies[112].

Current Status/Appropriateness/Effectiveness:
Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE[113] and the USCG[114] (17th District USCG). The AWT fulfils the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

The OLE in Alaska[115] protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679[116]]). The OLE focus on outreach and education programs to help the fishing industry understand the rationale for regulations and prevent or minimize infractions. The OLE enforcement staffing levels in the Alaska region were increased in 2017 to sixteen special agents and enforcement officers.

Compliance reports to the NPFMC confirm there are few major compliance issues in the fishery. (17th Coast Guard District Enforcement Report[117] – B4 USCG Report, 2019).

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's Office of General Counsel (OGC) for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment. The MSA has an enforcement policy section (50 CFR 600.740[118]) that details these "remedies for violations".

The USCG is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of responsibility within the USCG.

If the USCG detect a fisheries infringement they gather evidence and hand over the investigation to the OLE. The flatfish fishery has the potential for PSC bycatch, in particular halibut, at certain times of the year, however, voluntary compliance, i.e. recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue. The USCG use a software package (FishTactic) to assess risk of infringements and is used to assist the deployment of vessels and aircraft and target enforcement effort.

The NPFMC Groundfish and Halibut Observer Program[119] (The Observer Program) is an important component of the monitoring of the BSAI and GOA groundfish fisheries. The program is the main data gathering program for biological and fishery data that feed into stock assessment and management. While not directly part of the federal MCS program observers are required to report infringements. OLE and USCG officers conduct de-briefing interviews with observers, checking on vessels fishing practices

[108] https://www.uscg.mil/d17/
[109] https://www.fisheries.noaa.gov/about/office-law-enforcement
[110] http://dps.alaska.gov/AWT/
[111] https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf
[112] https://www.fisheries.noaa.gov/alaska/resources-fishing/electronic-monitoring-north-pacific
[113] http://www.nmfs.noaa.gov/ole/
[114] http://www.pacificarea.uscg.mil/Our-Organization/District-17/
[115] https://www.fisheries.noaa.gov/contact-directory/noaa-enforcement-field-offices
[116] https://alaskafisheries.noaa.gov/fisheries-679regs
[117] https://meetings.npfmc.org/CommentReview/DownloadFile?p=c0752dd1-92db-4d27-b405-dbb735d733bb.pdf&fileName=B6%20USCG%20Report.pdf
[118] https://www.law.cornell.edu/cfr/text/50/600.740
[119] https://alaskafisheries.noaa.gov/fisheries/observer-program

and the conduct of the crew. Observers will often report potential infringements to the vessel captains, thereby contributing to self-regulation and corrective action.

An annual report is produced each year on the Alaskan observer program, which covers fisheries in the BSAI and GOA Regions[120].

The Alaska Department of Public Safety[121], through its Division of Alaska Wildlife Troopers is primarily responsible for enforcing fish and wildlife-related statutes and regulations in Alaska. Some ADFG biologists and other staff have undertaken enforcement training and may participate in enforcement activities[122] and assist the Wildlife Troopers as needed. The AWT attend the BOF and have an important input in the development of state regulations and legislation.

Evidence Basis:
The OLE publishes a national annual report[123] and the Alaska region submits six monthly reports to the NPFMC. As an example, see OLE 2018[124].

The USCG publishes an annual report to the NPFMC on resources applied to fishery enforcement in the previous year, the number of boardings/inspections, the number of violations, lives lost at sea, safety issues, and any changes in regulations[125]. The most recent report (April – May 2017 –available on the NPFMC Enforcement Committee webpage) indicates a low number of infractions: from a total of 102 boardings, 11 safety equipment deficiencies were reported and no fishery violations.

The low occurrence of serious offences indicates that the flatfish (and other groundfish) fisheries are generally compliant with regulations and the sanctions are considered to be an effective deterrent.

The NPMC Enforcement Committee[126] is charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea[127]. The Committee is made up of governmental agencies (including OLE, USCG, ADFG, AWT) and organizations having expertise relating to the enforcement and monitoring of North Pacific groundfish and crab fisheries. Meetings are held on a regular basis, typically in conjunction with regular Council meetings and, are open to the public.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

US Coast Guard, 17th District https://www.uscg.mil/d17/

NOAA Office of Law Enforcement https://www.fisheries.noaa.gov/about/office-law-enforcement

Alaska Wildlife Troopers http://dps.alaska.gov/AWT/

NMFS Fisheries Enforcement Considerations https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf

Electronic monitoring in the North Pacific https://www.fisheries.noaa.gov/alaska/resources-fishing/electronic-monitoring-north-pacific

[120] https://www.fisheries.noaa.gov/tags/north-pacific-observer-program?title=annual%20report&field_species_vocab_target_id=&sort_by=created
[121] http://dps.alaska.gov
[122] http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main
[123] https://www.fws.gov/le/annual-reports.html
[124] https://meetings.npfmc.org/CommentReview/DownloadFile?p=7f898929-8fdf-4ef8-90a2-92e40ee58279.pdf&fileName=B4%20OLE%20Report.pdf
[125] https://www.npfmc.org/committees/enforcement-committee/
[126] https://www.npfmc.org/committees/enforcement-committee/
[127] https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

NOAA Enforcement Field Offices Alaska https://www.fisheries.noaa.gov/contact-directory/noaa-enforcement-field-offices Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679] https://alaskafisheries.noaa.gov/fisheries-679regs Us Coast Guard Compliance Report to the NPFMC https://meetings.npfmc.org/CommentReview/DownloadFile?p=c0752dd1-92db-4d27-b405-dbb735d733bb.pdf&fileName=B6%20USCG%20Report.pdf Magnuson Stevens Act. Enforcement Section https://www.law.cornell.edu/cfr/text/50/600.740 North Pacific Groundfish Observer Program https://www.fisheries.noaa.gov/alaska/fisheries-observers/north-pacific-observer-program The Alaska Department of Public Safety http://dps.alaska.gov ADFG Enforcement http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main Office of Law Enforcement Annual Reports https://www.fws.gov/le/annual-reports.html Office of Law Enforcement Apr-Sept Enforcement Report https://meetings.npfmc.org/CommentReview/DownloadFile?p=7f898929-8fdf-4ef8-90a2-92e40ee58279.pdf&fileName=B4%20OLE%20Report.pdf NPFMC Enforcement Committee https://www.npfmc.org/committees/enforcement-committee/ NPFMC Enforcement Committee – Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf
Non-Conformance Number (if relevant):

10.2 Fishing vessels shall not be allowed to operate on the resource in question without specific authorization. ***FAO CCRF (1995) 7.6.2 Other 8.1.2, 8.2.1***			
Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The local management body does **not** maintain an updated record of all authorization to fish, or vessels are permitted to operate on the resource in question without specific authorization. **Lacking in all parameters.**	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management body maintain an **insufficiently** updated record of all authorization to fish. **Lacking in two parameters.**	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management body maintain a **moderately** updated record of all authorization to fish. **Lacking in one parameter.**	Fishing vessels are not allowed to operate on the resource in question without specific authorization. **Fulfils all parameters.**
Evaluation Parameters **Process**: There is a mechanism or system established to maintain a record of fishing authorizations. **Current Status/Appropriateness/Effectiveness**: This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include various data.			
Evaluation (per parameter)/: **Process:**			

Every fishing vessel targeting Alaska groundfish is required to have a federal or state permit. The Restricted Access Management Program (RAM)[128] is responsible for managing NOAAs Alaska Region licence and permit programs. RAM responsibilities include: providing program information to the public, determining eligibility and issuing permits, processing transfers, collecting landing fees and related activities.

The Alaska Commercial Fisheries Entry Commission[129] (CFEC) helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers. CFEC issues permits and vessel licenses and provides due process hearings and appeals as and when needed.

Current Status/Appropriateness/Effectiveness:
OLE, USCG and AWT staff have on-line access to information related to permits and licences and are therefore able to confirm whether a vessel or individual has the correct credentials to be operating in a fishery.

Evidence Basis:
Details of licence and permits for the federal and state fisheries are maintained and are accessible on-line[130, 131]

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

The Restricted Access Management Program https://www.fisheries.noaa.gov/contact/restricted-access-management-program

The Alaska Commercial Fisheries Entry Commission https://www.cfec.state.ak.us

NOAA Licensing https://alaskafisheries.noaa.gov/permits-licenses

ADFG Licensing http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main

Non-Conformance Number (if relevant):

Not applicable - the fishery does not occur outside the EEZ.

10.3 States involved in the fishery shall, in accordance with international law, within the framework of sub-regional or regional fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their national jurisdiction.

FAO CCRF (1995) 8.1.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Within a regional framework involving other regional bodies, the local management body is **not** cooperating	Within a regional framework involving other regional bodies, the local management body is cooperating	Within a regional framework involving other regional bodies, the local management body is cooperating	States involved in the fishery do, in accordance with international law, within the framework of sub-regional or regional

[128] https://www.fisheries.noaa.gov/contact/restricted-access-management-program
[129] https://www.cfec.state.ak.us
[130] https://alaskafisheries.noaa.gov/permits-licenses
[131] http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main

in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. **Lacking in all parameters.**	**insufficiently** in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. **Lacking in two parameters.**	**moderately** in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. **Lacking in one parameter.**	fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their national jurisdiction. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.
Process: There is a mechanism or system established to conduct enforcement operations outside the country jurisdiction.
Current Status/Appropriateness/Effectiveness: This mechanism is enforcing operations in internationally occurring fisheries. If the stock under consideration is not transboundary, then the Standard need only be concerned with the effectiveness and suitability of the monitoring, surveillance, control and enforcement activities at the national level for the fishery of which the Unit of Certification is a part. If the Unit of Certification is part of a national fleet fishing on a transboundary stock, then it is still likely to be the effectiveness and suitability of the monitoring, surveillance, control and enforcement activities at the national level shall be assessed. If the Unit of Certification covers all the fishing on the stock under consideration, then the monitoring, surveillance, control and enforcement all of the national fleets is of concern and shall be assessed (to ensure full consideration of total fishing mortality on the stock under consideration).
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include enforcement reports.

Evaluation (per parameter):

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

Not applicable - the fishery does not occur outside the EEZ.

10.3.1 States which are members of or participants in sub-regional or regional fisheries management organizations or arrangements shall implement internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States shall also proceed, as necessary, to assist other States in achieving the objectives of the FAO CCRF (1995), and should make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any

other State.

FAO CCRF (1995) 7.7.5/8.3.*1*

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The State has **not** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in all parameters.**	The State has **insufficiently** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in two parameters.**	The State has **moderately** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in one parameter.**	The state which is members of or participants in sub-regional or regional fisheries management organizations or arrangements implements internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States also proceed, as necessary, to achieve and to assist other States in achieving the objectives of the FAO CCRF, and make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.
Process: There are regulations established against vessels flying the flag of non-members or non-participants country which may engage in activities which undermine the effectiveness of conservation and management measures established by regional bodies.
Current Status/Appropriateness/Effectiveness: These measures are effective in deterring such practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include enforcement or other reports.

Evaluation (per parameter):

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

Not applicable - the fishery does not occur outside the EEZ.

10.4 Flag States shall ensure that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish.

FAO CCRF (1995) 8.2.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No Certificate of Registry has been issued to vessels. **Lacking in all parameters.**	An **insufficient** number of vessels have been issued the Certificate of Registry. **Lacking in two parameters.**	A **moderate** number of vessels have been issued the Certificate of Registry. **Lacking in one parameter.**	The flag State ensures that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels carry on board the Certificate of Registry and their authorization to fish. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no foreign vessels fish in the State's EEZ, or if its vessels do not fish in high seas or in another State's EEZ.
Process: There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.
Current Status/Appropriateness/Effectiveness: These vessels have been issued with a Certificate of Registry and they are required to carry it on board.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

Evaluation (per parameter):

Process:

Current Status/Appropriateness/Effectiveness: **Evidence Basis:**				
Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐
References:				
Non-Conformance Number (if relevant):				

Not applicable - the fishery does not occur outside the EEZ.

10.4.1 Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State shall be marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.

FAO CCRF (1995) 8.2.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Vessels have **not** been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in all parameters.**	An **insufficient** number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in two parameters.**	A **moderate** number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in one parameter.**	Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State, are marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.
Process: There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.
Current Status/Appropriateness/Effectiveness: Foreign vessels authorized to fish in the State's EEZ or its vessels fishing in another State's EEZ have been marked accordingly to international guidelines.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

Evaluation (per parameter):

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☐
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.7.2/8.2.7

11.1 National laws of adequate severity shall be in place that provide for effective sanctions.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
National laws of adequate severity are **not** in place that provide for effective sanctions. **Lacking in all parameters.**	National laws of adequate severity are in place but **insufficient** to provide for effective sanctions. **Lacking in two parameters.**	National laws of adequate severity are in place but considered **moderate** in providing for effective sanctions. **Lacking in one parameter.**	National laws of adequate severity are in place that provide for effective sanctions. **Fulfils all parameters.**

Evaluation Parameters
Process: The system of national laws is of adequate severity to provide for effective sanctions.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that national laws are of adequate severity to provide for effective sanctions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

Evaluation (per parameter): General description of evidence in order to score the clause

Process /Current Status/Appropriateness/Effectiveness /Evidence Basis:

The MSA provides four options for penalizing violations. In ascending order of severity:

1) Issuance of a citation (a type of warning), usually at the scene of the offence (see 15 CFR part 904, subpart E[132]).
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 offences. 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 end.

OLE agents and officers can assess civil penalties directly to the violator in the form of a summary settlement or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation who

[132] https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E

can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings[133]. The low proportion of violations encountered during at-sea patrols of the Alaska fisheries demonstrates effective deterrence (Dec 2018-March 2019: 1,057 fishing vessel boardings in 2018; 23 violations; 2% violation rate – which is slightly below the average between 2015-2018) (17th Coast Guard District Enforcement Report[134] – B4 USCG Report, 2019).

Alaska state law, universal citation 16.05.723[135], describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanour conviction within a 10-year period will result in a fine 3 times the value of any fish in possession or a fine of $10,000, whichever is greater. The option of pursuing criminal action is also available to the state.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Attorney's Office for criminal proceedings https://fisheries.msc.org/en/fisheries/alaska-pollock-bering-sea-and-aleutian-islands/@@assessments

17th Coast Guard District Enforcement Report, 2019 https://meetings.npfmc.org/CommentReview/DownloadFile?p=c0752dd1-92db-4d27-b405-dbb735d733bb.pdf&fileName=B6%20USCG%20Report.pdf

Alaska state law, universal citation 16.05.723 https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723

Non-Conformance Number (if relevant):

11.2 Sanctions applicable in respect of violations and illegal activities shall be adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions shall also be in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.

FAO CCRF (1995) 7.7.2/8.1.9/8.2.7

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Sanctions considered effective in severity to deter violators are **not** in force. **Lacking in all parameters.**	Sanctions are in force but **insufficiently** effective to affect authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.	Sanctions are in force but **moderately** effective to affect authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.	Sanctions applicable in respect of violations and illegal activities are adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions are in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the

[133] https://fisheries.msc.org/en/fisheries/alaska-pollock-bering-sea-and-aleutian-islands/@@assessments
[134] https://meetings.npfmc.org/CommentReview/DownloadFile?p=c0752dd1-92db-4d27-b405-dbb735d733bb.pdf&fileName=B6%20USCG%20Report.pdf
[135] https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723

	Lacking in two parameters.	**Lacking in one parameter.**	event of non-compliance with conservation and management measures. **Fulfils all parameters.**

Evaluation Parameters
Process: The system of sanctions in place is sufficiently severe to deter violations and illegal activities. The system shall be considered adequate in severity if the potential sanctions include fines, suspension or withdrawal of permission to fish, and confiscation of catch or equipment.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that sanctions for violations of regulations (e.g., suspension, withdrawal or refusals of fishing permit or of the right to fish) are adequate in severity to secure compliance and discourage violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

Evaluation (per parameter): General description of evidence in order to score the clause

Process / current Status / Appropriateness / effectiveness
The parameters in clause 11.1 show that, with the limited violations, the sanctions imposed for violations can be considered to act as a sufficient deterrent.

Evidence Basis
NOAA Alaska region has available a "Summary Settlement and Fix-it Schedule"[136] which describes the violation and penalties associated with them. It also includes a sliding scale of penalty for repeat offences, i.e. increasing penalties for, 'first', 'second' and 'third' violations.

Alaska state law, universal citation 16.05.723, describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanour conviction within a 10-year period will result in a fine 3 times the value of any fish in possession or a fine of $10,000, whichever is greater. The option of pursuing criminal action is also available to the state.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NOAA Alaska Region - "Summary Settlement and Fix-it Schedule
http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf

Alaska state law, universal citation 16.05.723 https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723

Non-Conformance Number (if relevant):

Not applicable, no foreign vessel is licenced to fish within the Alaska EEZ, US licenced vessels do not fish on the high seas or in another State's EEZ for flatfish.

11.3 Flag States shall take enforcement measures in respect of fishing vessels entitled to fly their flag which have been found by them to have contravened applicable conservation and management measures, including, where appropriate, making the contravention of such measures an offence under national legislation.

FAO CCRF (1995) 8.2.7

Low Confidence	**Medium Confidence**	**Medium Confidence**	**High Confidence Rating**

[136] http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf

Rating (Critical NC)	Rating (Major NC)	Rating (Minor NC)	(Full Conformance)
There are **no** enforcement measures for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures. **Lacking in all parameters.**	There are **insufficiently** effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures. **Lacking in two parameters.**	There are **moderately** effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures. **Lacking in one parameter.**	Flag States take enforcement measures with fishing vessels entitled to fly their flag if the vessels have been found by the State to have contravened applicable conservation and management measures. These enforcement measures will include, where appropriate, making the contravention of such measures an offence under national legislation. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.
Process: If applicable, the system of enforcement measures is effective for foreign vessels fishing in the State's EEZ or for its vessels fishing in high seas or in another State's EEZ.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate enforcement action in these cases i.e., boarding, violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or enforcements reports.

Evaluation (per parameter)/:

Process:

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

F. Serious Impacts of the Fishery on the Ecosystem

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

FAO CCRF (1995) 7.2.3/8.4.7/8.4.8/12.11
FAO ECO (2009) 29.3/31
FAO Eco (2011) 41-41.4

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

FAO CCRF (1995) 7.2.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** assessment of the impacts of environmental factors on target stocks and associated species in the same ecosystems. **Lacking in all parameters.**	There is **insufficient** assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species. **Lacking in two parameters.**	There is **moderate** assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species. **Lacking in one parameter.**	The State assesses the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and the relationship among the populations in the ecosystem. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for the assessment and monitoring of environmental factors (e.g. climatic, oceanographic) on target stocks and associated species in the same ecosystem, and to assess the relationships between species in the ecosystem.
Current Status/Appropriateness/Effectiveness: There is evidence that assessments have been conducted to determine the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. The results of these studies are in sufficient detail to allow informed management of the fishery.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports**.**

Evaluation (per parameter):

Process:
NOAA, of which NMFS is a part, has a series of programs monitoring and modelling oceanographic processes in Alaskan and adjoining waters. The data, together with a range of other environmental monitoring information such as plankton, low trophic level fish species, fish populations, and population dynamics of higher predators are all assembled through NMFS. The relationship between environmental factors (biotic and abiotic) and BSAI and GoA flatfish are evaluated annually in the SAFE process. All significant and commercial species are assessed individually according to the SAFE Tier system. Most of the species' SAFE reports contain details on ecosystem effects on the species (e.g., prey availability) and fishery effects on the ecosystem. The SAFE evaluations provide a process by which a wide range of relevant environmental information is assembled and evaluated in relation to its potential effects. Ecosystem Status Reports are done annually for EBS, AI, and GOA, updating the climate, biological, and fishing effects in each region. In addition, the relationship between different populations in the ecosystem is evaluated through ongoing ecosystem and multi-species modelling programs within NMFS. These information sources are presented and considered annually at NPFMC meetings.

Current Status/Appropriateness/Effectiveness:
There is clear evidence that relatively in-depth studies (especially considering the extent of the area under consideration) have been conducted on the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems and on the relationships among these species. Not only are a wide range of parameters monitored, but these are then synthesised into a readily understood form; from systems ecologists to stock assessment scientists and from the SAFE process to managers at NPFMC. NPFMC managers also require information from ecosystem modelling as part of the management process.

The relationships among populations in the ecosystem has been extensively examined through a variety of ecosystem and multi-species models. Food web modelling using Ecopath/Ecosim has been carried out for EBS, AI, and GOA, which provides predominantly guild level analyses of cumulative and ecosystem-level indicators. The CEATTLE model is an example of an "environmentally enhanced" stock assessment model that utilizes abundance, catch and diet data (e.g., catch-at-age data, predator diet information) to estimate fishing mortality, recruitment, stock size, and predation mortality.

As noted in Section 3.8, current conditions have been unusually warm with sea surface temperatures as much as 3° C (about 5.4° F) higher than average. Additionally, in recent years, the annual ice cover in the BS has decreased dramatically, which has likely had an effect on several species' survivability and reproductive success. These changes, while not yet fully understood by the scientific community, are being investigated. The NPFMC's SSC and the Groundfish Plan Teams are considering these factors on an ongoing basis as they assess the groundfish stocks (e.g., BSAI yellowfin sole 2018 SAFE report).

Evidence Basis:
There is a significant evidence base including annual stock assessment reports, ecosystem status reports, results of modelling output (the majority of which are published in peer-reviewed scientific journals), and reports of Council meetings, all of which are publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NOAA 2019: https://www.integratedecosystemassessment.noaa.gov/regions/alaska/ebs-integrated-modeling
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.2.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** assessment and corrections where appropriate, of adverse environmental impacts on the resources from human activities. Most or all of the potential impacts listed in the evaluation parameters are not considered. **Lacking in all parameters.**	There is **insufficient** assessment and corrections, where appropriate, of adverse environmental impacts on the resources from human activities. Many of the potential impacts listed in the evaluation parameters are not considered. **Lacking in two parameters.**	There is **moderate** assessment and corrections where appropriate, of adverse environmental impacts on the resources from human activities. Some of the potential impacts listed in the evaluation parameters are not considered. **Lacking in one parameter.**	Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected. All potential impacts listed in the evaluation parameters are considered. **Fulfils all parameters**.

Evaluation Parameters
Process: There is a process that allows for the assessment of environmental impacts and their

minimization or correction.
Current Status/Appropriateness/Effectiveness: There is evidence of appropriate assessments made to elucidate the impacts environmental impacts on the resources from human activities. Human impacts include both fishing and non-fishing activities. Examples may include overfishing of the target stock, significant bycatch of associated species, gear-habitat interactions, and where relevant, mining, dredging, pollution, introduction of exotic species, and conversion of important aquatic habitats.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
Adverse environmental effects on fish resources from fishery-related activities are evaluated through a Programmatic Supplemental Environmental Impact Statement (PSEIS). The 2004 Alaska Groundfish Fisheries PSEIS evaluated the cumulative changes in the management of the groundfish fisheries since the implementation of the Fishery Management Plan for the Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) and the FMP for the Groundfish of the Gulf of Alaska (GOA FMP) and considered a broad array of policy-level programmatic alternatives. On the basis of the analysis, the North Pacific Fishery Management Council (NPFMC) adopted a management approach statement, policy goal statements, and accompanying objectives. Periodically, the NPFMC conducts a review of the policy goal statements and objectives to assess how they are being implemented and to see whether changes are warranted. They also reviewed factors that may influence the timing for supplementing or updating the 2004 PSEIS.

The National Environmental Policy Act (NEPA) requires agencies to prepare a supplemental EIS (SEIS) to either draft or final EISs if the agency (1) makes substantial changes in the proposed action that are relevant to environmental concerns or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. An SEIS is required if the new information is sufficient to show a proposed or remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered. In April 2014, the NPFMC evaluated whether the triggers for supplementing the PSEIS have been met and concluded both that a supplemental EIS was not required and that they did not choose to reinitiate programmatic changes to the groundfish fisheries that would necessitate a SEIS. NMFS has since reached a determination affirming that the 2004 PSEIS continues to provide NEPA compliance for the groundfish FMPs (NMFS 2015).

Current Status/Appropriateness/Effectiveness:
The requirements of NEPA set a legislative framework for the evaluation of adverse effects from human activities. This is enacted through the PSEIS process (and subsequent reviews) for fishery-related effects and through EISs by the relevant organisations for non-fishery related effects, in which NMFS, NPFMC, and ADFG would be consulted, as appropriate. There is clear evidence that appropriate assessments have been carried out and reviewed for fishery-related effects (notably the 2004 PSEIS and 2014 review). Recent examples of EIS of non-fishing activities and their effects on resources are also available (e.g., Pebble Project; U.S. Army Corps of Engineers 2018).

Evidence Basis:
The PSEIS, review documents, and EISs of non-fishing activities are publicly available (e.g., NMFS 2015, U.S. Army Corps of Engineers 2018).

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
U.S. Army Corps of Engineers 2018: https://www.pebbleprojecteis.com/documents/eis

Non-Conformance Number (if relevant):

12.3 The most probable adverse impacts of the fishery on the ecosystem/environment shall be considered, taking into account available scientific information, and local knowledge. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.

FAO Eco (2009) 30.4, 31, 31.4
FAO Eco (2011) 41.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** accounting of most probable adverse impacts of the fishery on the ecosystem/environment. Few or no probable impacts are considered. There is **no** use of generic evidence on the ecosystem impact of fishing for the unit of certification. **Lacking in all parameters.**	There is **insufficient** accounting of most probable adverse impacts of the fishery on the ecosystem/environment. Many probable impacts are not considered. There is **insufficient** availability or use of generic evidence on the ecosystem impact of fishing for the unit of certification. **Lacking in two parameters.**	There is **moderate** accounting of most probable adverse impacts of the fishery on the ecosystem/environment. Some probable impacts are not considered. There is **moderate** availability or use of generic evidence on the ecosystem impact of fishing for the unit of certification. **Lacking in one parameter.**	The most probable adverse impacts of the fishery on the ecosystem/environment are considered, taking into account available scientific information, and local knowledge. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence is necessary to ascertain the adequacy of mitigation measures. **Fulfils all parameters.**

Evaluation Parameters

Process: There is specific information on the ecosystem impacts of fishing for the unit of certification present. Also, there is a mechanism in place by which the most probable adverse impacts of the fishery on the ecosystem and environment are assessed using the best available scientific knowledge (which may include traditional knowledge where this is verifiable), and management objectives aimed at avoiding these impacts are developed.

Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter. All probable negative impacts are considered. Such impacts may include significant impacts on non-target fishery resources (including discards), gear-habitat interactions, endangered, threatened, protected (ETP) species interactions, and food web interactions. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, keystone species or species with relative low growth rates, high catchability, or fisheries with significant ETP, bycatch of non-target fishery resources (or non-target stocks or species or harvests or discards), or with important concerns for gear–habitat interactions can be considered high risk. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:

Through scientific investigations of NMFS, the PSEIS provides a comprehensive evaluation of the FMPs. The SAFE process evaluates the stock status of the target species on an annual basis, considering major

bycatches, effects on prohibited species (i.e., species which cannot be landed and have limits in place on total catches in a fishery sector; these are notably halibut and salmon), habitat, and a wide-ranging consideration of ecosystem indicators. These evaluations are supported by extensive monitoring programs with specific investigations on issues of concern (such as Essential Fish Habitat impacts, reductions in fur seal populations, Stellar sea lion feeding resources, and impacts on seabirds). The NPFMC and Alaska Board of Fisheries (BoF) both have wide-ranging representation from the stakeholder community. In addition, Groundfish Plan Team, Ecosystem Committee, NPFMC, and BoF meetings are all open to public attendance. Available scientific information is therefore fundamental to the impact evaluation process and is reinforced by information and issues raised by stakeholders throughout the management process.

Significant specific information is collected on all appreciable adverse effects of the fishery on the ecosystem, using both specific scientific studies as well as views and information provided by the wider stakeholder community. These are assessed through PSEIS and routinely through the SAFE, NPMFC, and BoF processes. Management objectives have been developed in response to these processes: the PSEIS process led to the NPFMC adoption of nine policy goal statements with 45 accompanying objectives. Each major stock is subject to a SAFE assessment, and specific management objectives are developed in response to any new issues arising. In 2014, the NPFMC adopted an Ecosystem Policy, which is considered in all long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management. The intent is that management explicitly takes "into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species" and incorporates "the best available science, including local and traditional knowledge, and engage scientists, managers, and the public" (NPFMC 2019b).

Current Status/Appropriateness/Effectiveness:
Management measures are in place, based on a sound and fishery-related evidence platforms and extensive evaluations, designed to achieve the stated objectives for relevant ecosystem components. These specifically include marine mammals, seabirds, prohibited species, target and bycatch species, essential fish habitat, Habitat Areas of Particular Concern, and food-web effects. As such, information and objectives are specific to the Unit of Certification and/or fishery management system, and use of more generic information is not considered necessary.

Evidence Basis:
There is an extensive evidence base setting out the evaluation of potential adverse effects of the fishery, the management objectives related to these, the measures in place to achieve the objectives, and ongoing monitoring of the effectiveness of these measures. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis

NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019d: https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska

NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2019b: https://www.npfmc.org/management-policies/
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019d: https://www.npfmc.org/crab-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2019f: https://www.npfmc.org/bering-seaaleutian-islands-groundfish/

Non-Conformance Number (if relevant):

12.4 Impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.

FAO Eco (2009) 29.3, 29.4, 31
FAO Eco (2011) 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** addressing of significant impacts employing an immediate management response or a further analysis of the identified risk. **Lacking in all parameters.**	Impacts that are likely to have serious consequences are **insufficiently** addressed employing an immediate management response or a further analysis of the identified risk. **Lacking in two parameters.**	Impacts that are likely to have serious consequences are **moderately** addressed employing an immediate management response or a further analysis of the identified risk. **Lacking in one parameter.**	Impacts that are likely to have serious consequences are addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for impacts that are likely to have serious consequences to be addressed.
Current Status/Appropriateness/Effectiveness: If there are impacts likely to have serious consequences, there is evidence available to support the use of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
There are several processes in place that address actual or potential impacts identified through the monitoring of the fishery and the ecosystem supporting the fishery. The primary mechanism is the annual SAFE report for each target species. Following scientific assessment by the assessment authors and NMFS plan teams, information and recommendations are made to the SSC and NPFMC. The NPFMC

review includes consideration of inputs on effects on habitats, protected species, and the wider ecosystem, all of which may affect decision making. The process of managing the fishery in relation to these considerations is set out in the FMPs, which is subject to review through the PSEIS to determine the impacts of management options.

There are specific processes through NMFS and U.S. Fish and Wildlife Service (USFWS) to review potential impacts (generally indirect effects through changes in prey availability) on endangered species (through the Endangered Species Act) and marine mammals (as per the Marine Mammal Protection Act). Assessments of the effects of the Alaska groundfish fisheries on many endangered species are also provided in the Alaska Groundfish Harvest Specifications. There are also requirements for the relevant agency (NMFS or USFWS) to evaluate (provide a Biological Opinion) on the effects of the FMPs for the GOA and BSAI groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species.

There is evidence from each aspect of the fishery management for the implementation of management responses (or the further analysis where impacts may be indirect and uncertain). In particular:

1. Conservative harvest levels are set for single and multi-species fisheries – these are demonstrable for each target species and group affected.
2. Acceptable Biological Catch levels are adjusted to account for uncertainty and wider effects on the ecosystem.
3. Measures are in place to minimise bycatch and discarding (see Clause 12.5), including specific requirements and management/operational responses relating to prohibited species (notably chinook salmon and halibut).
4. Measures have been implemented to minimise direct effects on endangered species and prohibited species (such as bird deterrents on longline vessels to reduce mortality of, among others, short-tailed albatross and salmon escapement devices on trawls) and to minimise indirect effects (such as closure of essential habitat surrounding Steller sea lion rookeries).
5. Measures are in place to protect essential fish habitat (where relevant) and Habitat Areas of Particular Concern (HAPC). Several HAPCs are designated in the GoA, EBS, and AI.

Current Status/Appropriateness/Effectiveness:
Wherever impacts are identified, there is evidence available to support the use of an immediate management response, as set out above. For example, directed fishing for Kamchatka flounder in BSAI was prohibited in June 2019 as a necessary measure to ensure the TAC was not exceeded. In March 2019, directed fishing for sablefish, rockfish, deep-water flatfish, rex sole, and arrowtooth flounder in GOA was prohibited to ensure the Pacific halibut bycatch limit was not exceeded. In some cases, further information may be required, and if so, studies are implemented generally with an accompanying precautionary management measure. For example, the northern fur seal is listed as depleted under the MMPA, with the Eastern Stock population at less than 50% of its historical peak. This has already been considered in a precautionary way in TAC-setting through NPFMC consideration of ecosystem indicators, one of which is fur seal pup success. The 2007 Northern Fur Seal Conservation Plan is in the process of being updated and will continue to assess adverse effects of human activities (i.e., disturbance, bycatch, research, illegal shooting, and entanglement).

Evidence Basis:
There is an extensive evidence base setting out the evaluation of effects and implementation of management response, including SAFE reports, FMPs, endangered species conservation plans, and supporting EISs. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures

NMFS 2019g: https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications
NMFS 2019h: https://www.fisheries.noaa.gov/bulletin/nmfs-prohibits-directed-fishing-kamchatka-flounder-bering-sea-and-aleutian-islands-1
NMFS 2019i: https://www.fisheries.noaa.gov/bulletin/nmfs-prohibits-directed-fishing-deep-water-species-vessels-using-trawl-gear-gulf-2
NMFS 2018a: https://www.npfmc.org/wp-content/PDFdocuments/membership/EcosystemCommittee/Meetings2018/NFS_Cons_Plan_Activities.pdf
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
NMFS 2010: https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019d: https://www.npfmc.org/crab-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2019f: https://www.npfmc.org/bering-seaaleutian-islands-groundfish/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

12.5 Appropriate measures shall be applied to minimize:

- catch, waste and discards of non-target species (both fish and non-fish species).
- impacts on associated, dependent or endangered species

FAO CCRF (1995) 7.6.9
FAO Eco (2009) 31.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in all parameters.**	There is **insufficient** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in two parameters.**	There is **moderate** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in one parameter.**	Appropriate measures are applied to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism by which management measures are developed to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent and ETP species. This system shall include the development of specific management objectives.
Current Status/Appropriateness/Effectiveness: There are measures in place to minimize catch, waste, and discards of non-target species (both fish and non-fish species). These measures are considered effective at achieving the specific management objectives described in the process parameter.
There are measures in place to minimize impacts on associated, dependent, or endangered species.

These measures are considered effective at achieving the specific management objectives described in the process parameter.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
The principal mechanism for directing measures to minimise catch, waste, and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent, or endangered species is the FMP (for the BSAI and GOA). To manage incidental catch and to reduce bycatch and waste, the FMPs specify the following objectives:

1. Continue and improve current incidental catch and bycatch management program.
2. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
3. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
4. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
5. Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.
6. Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species.
7. Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.
8. Reduce waste to biologically and socially acceptable levels.
9. Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.

In addition, specific allocations are made to each sector of the groundfish fishery for catches of prohibited species (e.g., halibut, salmon, crab, herring). For example, bycatch caps are in place for halibut. When met, time-area closures are implemented, and industry is encouraged to limit catches through gear modifications (such as halibut excluders in trawl gear). Bycatch limits for prohibited species are apportioned by sector and season.

The setting of retention requirements and prohibited species catches through the FMP process provides a mechanism by which the catch, waste, and discarding of non-target species is minimised. The extent and efficacy of these measures will also limit any impact of the fishery on associated, dependent, and endangered species.

Current Status/Appropriateness/Effectiveness:
There is a comprehensive set of measures in place to minimize catch, waste, and discards of non-target species, as described above. These, combined with operational measures employed by industry to meet the specific targets, are considered effective at achieving the specified management objectives. Also, specific measures are in place to minimise impacts on associated, dependent, or endangered species; the prohibited species limits and requirements will directly affect those species while measures are in place to deter seabirds from gear, to avoid critical habitat of endangered species, and to maintain ecosystem function through monitoring of a range of indicators of the state of the ecosystem that are specifically considered by the plan teams and NPFMC.

Evidence Basis:
There is an extensive evidence, including FMPs, in-season catch reporting, and endangered species conservation plans. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NMFS 2019i: https://www.fisheries.noaa.gov/bulletin/nmfs-prohibits-directed-fishing-deep-water-species-vessels-using-trawl-gear-gulf-2
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019d: https://www.npfmc.org/crab-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

Non-Conformance Number (if relevant):

12.5.1 There shall be management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

FAO ECO (2011) 41

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are **no** management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in all parameters.**	There are **insufficiently** effective management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in two parameters.**	There are **moderately** effective management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in one parameter.**	There are effective management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process in place that allows for the creation of management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. A note on data collections. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important inter alia because its capacity for supporting reliable assessment of current status and trends declines as it gets older. The requirements for data collection are focussed on the effects of the unit of certification on

endangered species.
Current Status/Appropriateness/Effectiveness: There is evidence of effective management objectives in place in the fishery under assessment (e.g. in a fishery management plan) that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation:

Process:
There is a process in place for the development of management objectives to ensure that endangered species are protected from adverse impacts from interactions with the unit of certification are set out in Clause 12.12 below. Measures to preserve the biodiversity of ecosystems (notably Habitat Areas of Particular Concern) are considered under Clauses 3.2.5, 12.9, and 12.13.

The processes in place address the designation of species and the development of objectives and measures under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) for various species (e.g., salmon, Steller sea lions). Section 3.6.5 sets out the basis of the observer program and the levels of precision available. This program forms the basis of data collection directly relevant to these fisheries under assessment and provides comprehensive and high-quality data commensurate to the scale and intensity of the fleet component (noting that observer coverage varies between catcher processor and catcher vessels, gear type, and federal and state fisheries). The observer program is ongoing and provides ongoing updated data on all major aspects of the fisheries, including interactions with endangered and prohibited species.

The ESA was established in 1973 and carries out the provisions in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The ESA aims to conserve endangered and threatened fish, wildlife, and plant species and is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's NMFS. With regard to fishing activities, the USFWS allows a certain level of "incidental take" (IT) of a listed species in cases where "an action may adversely affect a species but not jeopardize its continued existence" (USFWS 2017).

CITES is a multilateral treaty established to protect endangered plants and animals. It was drafted at a meeting of members of the International Union for Conservation of Nature (IUCN) and became effective in 1975. It aims to ensure that the international trade of wild animals and plants does not threaten the survival of these species, and it extends varying degrees of protection to more than 35,000 animal and plant species. Each CITES-protected species is assigned an appendix, which specifics the extent of the threat and the trade controls applied to that species. CITES Appendix I, the highest level, includes the species that are threatened with extinction and are, or may be, affected by trade.

The MMPA was enacted in 1972 in response to increasing concerns that human activity was causing significant declines in some marine mammal populations. All marine mammals in U.S. waters are protected by the MMPA, which is implemented by NMFS, USFWS, and the Marine Mammal Commission. NMFS performs various conservation and management actions, including:

- Development and implementation of conservation plans for depleted species
- Development and implementation of take-reduction plans to minimize commercial fishing bycatch
- Coordination of the Marine Mammal Health and Stranding Response Program and investigation of unusual mortality events
- Collaboration with other nations to ensure that international trade does not threaten marine mammals
- Investigation and prosecution of MMPA violations

Specific monitoring of endangered species is carried out throughout the EBS, AI, and GOA as appropriate. Marine mammals are monitored according to requirements within the MMPA. Interactions between marine mammals and commercial fisheries are addressed in stock assessments with regional scientific review groups to advise and report on the status of marine mammal stocks within Alaskan waters. These assessments include descriptions of the stock's geographic range, minimum population estimates, current population trends, current and maximum net productivity rates, optimum sustainable population levels, allowable removal levels, and estimates of annual human-caused mortality and serious

injury through interactions with commercial fisheries (and subsistence hunters). These data are used to evaluate the progress of each fishery toward achieving the MMPA's goal of zero fishery-related mortality and serious injury of marine mammals. Surveys including aerial counts of adults and pups and satellite tagging studies are done regularly.

Additionally, the USFWS compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process). Salmon are monitored through assessments carried out by relevant departments of Fish and Game (notably the Alaska Department of Fish and Game).

Current Status/Appropriateness/Effectiveness:
The effectiveness of management objectives and accompanying measures in the groundfish fisheries is considered appropriate and effective in ensuring that endangered species are protected from adverse impacts resulting from interactions with the unit of certification.

Objectives set out in the BSAI and GOA FMPs are:

- Continue to cooperate with USFWS to protect ESA-listed species, and if appropriate and practicable, other seabird species.
- Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions (*Eumetopias jubatus*).
- Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
- Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

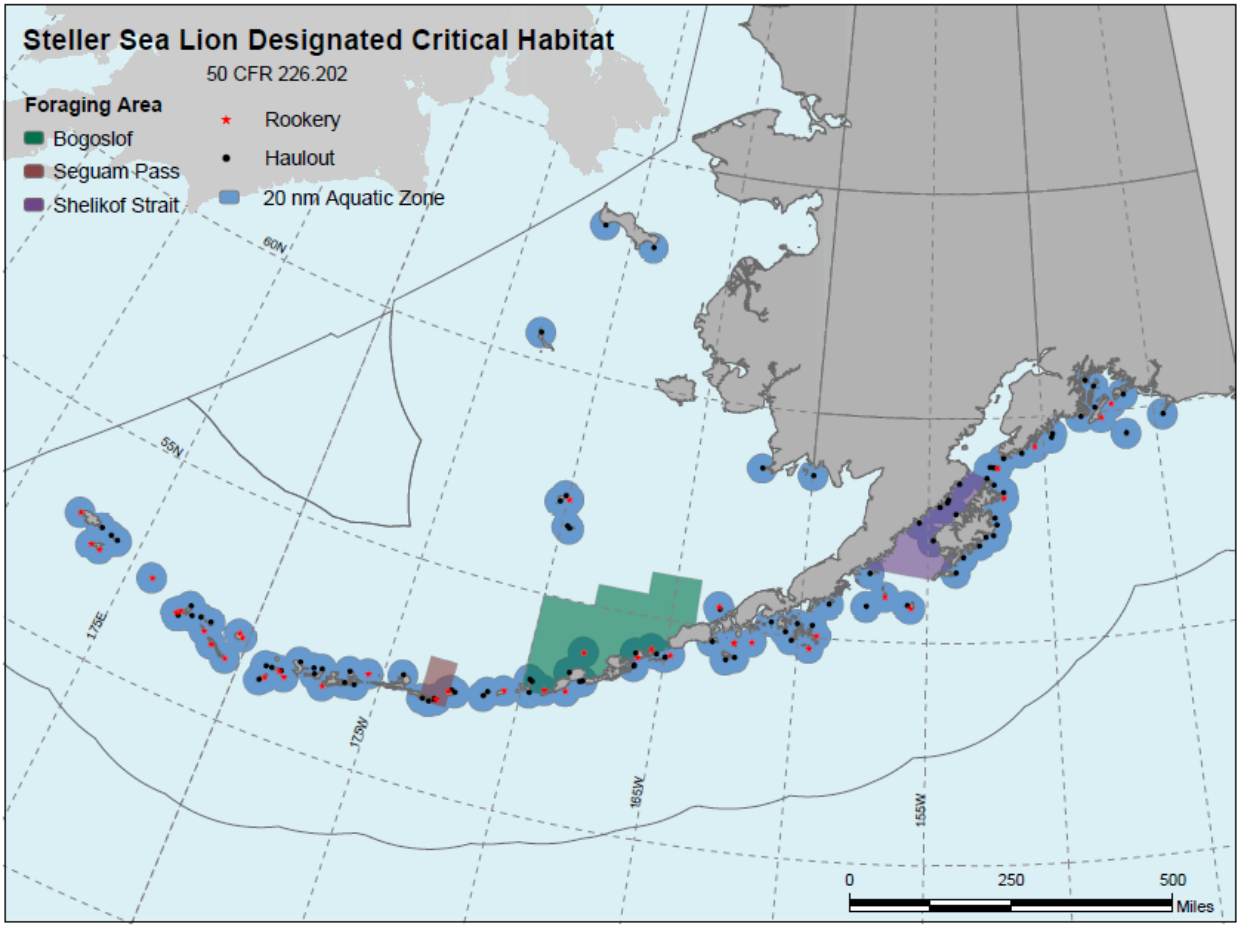
NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries (LOF) according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤1% of the marine mammal's potential biological removal (PBR) level and total fishery-related mortality <10% of PBR. Any fishery in Category III is considered to have achieved the target level of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that is >1% but is <50% of the stock's PBR level, if total fishery related mortality is ≥10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥50% of PRB. The BSAI flatfish trawl fishery is a Category II; the GOA flatfish trawl and BSAI Greenland turbot longline fisheries are Category III. Observer program data provide annual estimates of takes of endangered species – fish, seabirds, and marine mammals in the BSAI and GOA flatfish fisheries.

<u>BSAI flatfish trawl fishery:</u> The following species are listed on the LOF as relevant to this fishery:

- Bearded seal (Alaska)
- Gray whale (eastern North Pacific)
- Harbor porpoise (Bering Sea)
- Harbor seal (Bering Sea)
- Humpback whale (western North Pacific)
- Killer whale (Alaska resident)
- Killer whale (GOA, AI, and BS transient)
- Northern fur seal (eastern Pacific)
- Ribbon seal (Alaska)
- Ringed seal (Alaska)
- Spotted seal (Alaska)
- Steller sea lion (western US)
- Walrus (Alaska)

Marine mammals are rarely taken incidentally in the BSAI flatfish trawl fishery. Of these species, four are also ESA-listed species: bearded seal and ringed seal are both threatened, and humpback whale and Steller sea lion are both endangered. The gray whale and humpback whale are also listed in CITES Appendix I. From the species listed above, only 1 bearded seal, 2 northern fur seals, 1 ringed seal, 1 spotted seal, and 3 Steller sea lions were seriously injured or killed by the BSAI flatfish fishery in 2015 (the most recent year for data). All of these catch numbers are significantly less than the species' PBRs. Additionally, certain mitigation measures are in place to limit interactions (e.g., closed areas for Steller sea lion breeding).

Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. For marine mammals whose foraging and prey preferences overlap with the fishery, fishery removals could potentially adversely affect the amount or distribution of prey. Accordingly, habitat essential to endangered species is identified according to regulatory requirements (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated critical habitat for Steller sea lions in the Aleutian Islands and Gulf of Alaska included 3 nm no-entry zones around rookeries and haulouts, prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.



The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries. This fishery catches northern fulmars, gulls, kittiwakes, Laysan albatross, and shearwaters, most of which are not endangered, threatened, or protected. Additionally, the catch numbers of these species in this fishery are minimal.

Three ESA-threatened salmon stocks that migrate to Alaskan waters include Lower Columbia River Chinook salmon, upper Willamette River Chinook salmon, and Lower Columbia River Chinook, spring. About 90% of the Chinook salmon bycatch is taken in the pollock fishery and available data indicate that salmon bycatch in the BSAI flatfish fishery does not pose a threat to ESA-listed salmon populations in the Pacific Northwest.

<u>GOA flatfish trawl fishery:</u>
The following species are listed on the LOF as relevant to this fishery:

- Harbor seal (Alaska)
- Northern elephant seal (North Pacific)
- Steller sea lion (western US)

Marine mammals are rarely taken incidentally in the GOA flatfish trawl fishery. The northern elephant seal is the only LOF-listed species caught by the fishery, and according to catch data, none were caught in 2015 (the most recent year for data). The Steller sea lion is not listed on the LOF for the GOA but is an ESA-listed species, and according to catch data, the fishery did catch one in 2015. None of these species is listed in CITES Appendix 1. These catch numbers are significantly less than the species' PBRs. A number of management actions were implemented by NMFS and NPFMC to promote the recovery of Steller sea lions, including the restriction of trawling within areas of critical habitat (see figure above). Recent surveys indicate that in the GOA pup and non-pup numbers have increased, showing positive population trends.

For seabirds, this fishery catches northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the BSAI flatfish fishery, the GOA flatfish fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

BSAI Greenland turbot longline fishery:
The killer whale (Alaska resident) is the only species listed on the LOF as relevant to this fishery. While the killer whale is protected by the MMPA, it is not listed on the ESA or CITES Appendix I. Marine mammals are rarely taken incidentally in this fishery. According to the most recent data (2015), the fishery caught one killer whale that year, which is significantly less than the species PBR.

The only seabird caught by this fishery in substantive numbers is the northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the other fisheries, this fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

Evidence Basis:
FMPs and protected species management plans are all widely available through NMFS and NPFMC websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Helker et al. 2017: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019b: https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables
NMFS 2019c: https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
NMFS 2019d: https://www.fisheries.noaa.gov/resource/document/seabird-bycatch-estimates-alaska-groundfish-fisheries-2018
NMFS 2017a: https://www.afsc.noaa.gov/publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
USFWS 2017: https://www.fws.gov/midwest/endangered/section7/section7.html

Non-Conformance Number (if relevant):

12.6 Non target catches, including discards, of stocks other than the "stock under consideration" shall be monitored and shall not threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action shall be taken.

FAO Eco (2009) 31.1
FAO Eco (2011) 41.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Non-target catches, including discards, of stocks other than the "stock under consideration" are **not** monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are **not** taken. **Lacking in all parameters.**	Non-target catches, including discards, of stocks other than the "stock under consideration" are **insufficiently** monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are **insufficiently** taken. **Lacking in two parameters.**	Non-target catches, including discards, of stocks other than the "stock under consideration" are **moderately** monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are **moderately** taken. **Lacking in one parameter.**	Non-target catches, including discards, of stocks other than the "stock under consideration" are monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are taken. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system to monitor non-target catches and discards of stocks other than the stock under consideration, and to determine the likelihood that these catches and discards represent a significant risk to the affected species. The assessment of risks shall support the achievement of appropriate management objectives for bycatch species.
Current Status/Appropriateness/Effectiveness: If catches endanger these stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible serious risk of extinction, effective remedial action is taken by the management organization. Examples of irreversible or very slowly reversible effects on bycatch species include excessive depletion of very long-lived organisms. To mitigate effects that are likely to be irreversible or very slowly reversible requires those effects to be made less severe such that they are no longer likely to be irreversible or very slowly reversible. Examples of management measures may include incidental take allowances, bycatch caps, prohibited retention, safe release practices, or use of bycatch reduction devices or practices. Remedial action shall be considered effective if it reduces the impact of the fishery on non-target species to the point where there is no longer a risk of extinction.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
Monitoring of non-target catches and discards is provided by fishery observers deployed to vessels and on floating or shoreside processing plants and by industry reports of catch and production. The NMFS Alaska Regional Office's Catch Accounting System then produces bycatch estimates with near real-time delivery of accurate groundfish and prohibited species catch and bycatch information. This information is used for in-season management decisions. The observer program has been described in detail under Section 3.6.5. While the percentage observer coverage may vary with sectors, the program does address all areas of impact of the fleet, including non-target catches of groundfish, prohibited species (e.g., chinook and chum salmon, halibut), endangered species, other fish, and invertebrate species.

These data provided through the observer program are then specifically used in the stock assessment process for all groundfish and prohibited species. None of these species is at serious risk of extinction, recruitment overfishing, or other impacts that are likely to be irreversible or very slowly reversible. Catches of endangered species are evaluated in relation to acceptable levels of impact, which may be tested through statutory biological opinion analyses. Management measures are then demonstrably implemented (such as in the case of Steller sea lions; see Clause 12.5.1).

The observer program and catch reporting system provide a system to monitor non-target catches and discards. Monitoring species catch trends through existing or developing stock assessments or ecosystem monitoring covering other aspects determines the likelihood that these catches and discards represent a significant risk to the affected species. Where risks are identified, such as avoidance of significant impact to endangered species and avoidance of prohibited species, the near real-time catch accounting system allows for the achievement of appropriate management objectives.

Deck sorting for halibut now occurs on all catcher processors in the cod, flatfish, Atka mackerel, and Pacific Ocean perch fisheries, with at least 90% of the tows covered (see Section 3.6.5 for more details). The goal is to further limit halibut bycatch and mortality. This management measure is currently undergoing further development by NMFS, but preliminary research shows that deck sorting reduces bycatch and mortality.

Current Status/Appropriateness/Effectiveness:
For the majority of species, catches do not pose a risk of overfishing. For those species for which risk of extinction or other impacts that are likely to be irreversible or very slowly reversible is a threat – endangered species and prohibited species - effective actions to limit catches have been implemented. These measures include incidental take allowances (for ESA-listed endangered species and prohibited species), no retention of prohibited species (e.g., chinook and chum salmon, halibut), safe release practices (notably for halibut), and the use of bycatch reduction devices or practices such as streamer lines to reduce seabird bycatch and trawl modification to allow salmon escapement. Other measures such as avoidance of critical habitat (e.g., for Steller sea lions) have also been implemented. The sum of such remedial actions is considered effective in avoiding the risk of extinction of any non-target stocks through fishery-related impacts.

Evidence Basis:
Details of the observer program, monitoring results, and aggregated catch information, together with ecosystem evaluations, stock assessments, FMPs, and protected species management plans, are all widely available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Federal Register 2019: https://www.federalregister.gov/documents/2019/04/16/2019-07179/fisheries-of-the-exclusive-economic-zone-off-alaska-halibut-deck-sorting-monitoring-requirements-for
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2018b: http://comments.npfmc.org/CommentReview/DownloadFile?p=69bc0355-4b84-4c91-b5ae-f7cf3c2cf975.pdf&fileName=0006_4_B2%20Deck%20Sorting%20RIR%205-25-18.pdf
NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2018c: https://www.npfmc.org/halibut-deck-sorting-efp-2/

Non-Conformance Number (if relevant):

12.7 The role of the "stock under consideration" in the food web shall be considered, and if it is a key prey species in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.

FAO Eco (2009) 31.2
FAO Eco (2011) 41.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** consideration of the role of the "stock under consideration" in the food web, especially if it is a key prey species in the ecosystem, to avoid severe adverse impacts on dependent predators. **Lacking in all parameters.**	There is **insufficient** consideration of the role of the "stock under consideration" in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators. **Lacking in two parameters.**	There is **moderate** consideration of the role of the "stock under consideration" in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators. **Lacking in one parameter.**	The role of the "stock under consideration" in the food web is considered, and for a key prey species in the ecosystem, with objectives and management measures are in place to avoid severe adverse impacts on dependent predators. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism in place by which the role of the stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined. If the species is considered by the relevant scientific authority to be an important prey species, there shall be specific management objectives relating to minimizing the impacts of the fishery on dependent predators. The FAO Guidelines require that all sources of fishing mortality on the stock under consideration are taken into account (whether or not it is a prey species) in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches and catches in other fisheries.
Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the management objectives described in the process parameter, and there is evidence to demonstrate that they are successful to this end. If the species under assessment is not considered to be a key prey species, then this parameter shall be considered fulfilled.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
The role of each stock in the food web is specifically considered in the EBS, AI, and GOA systems. This includes specific monitoring and evaluation of ecosystem interactions, notably through the ecosystem indicators reported to the stock assessment authors and considered at the Plan Team, SSC and NPFMC deliberations. These indicators include physical conditions and prey and predator indicators, such as mesozooplankton, copepod size, capelin populations, apex fish biomass, and Steller sea lions and northern fur seal success.

In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

The use of ecosystem monitoring and modelling information is specifically required or requested by the

NPFMC, notably the use of ecosystem indicators in the SAFE process, multispecies models, and the FEAST spatial model (although these are used more in EBS than in the AI or GOA). This therefore provides a mechanism by which the role of the stocks under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined and evaluated. While several of these flatfish species are prey for pollock and the endangered Steller sea lion, they are not the primary food source. Further, none of the flatfish species appears to be a substantive portion of a predator's diet so it is not expected that a change in a flatfish species' population would have a great effect on prey availability. It is noted that through catch reporting and observer monitoring of all fleets, all sources of fishing mortality on the stocks under consideration are taken into account in assessing the state of the stocks under consideration, including discards, unobserved mortality, incidental mortality, unreported catches, and catches in other fisheries.

Current Status/Appropriateness/Effectiveness:
The development of ecosystem indicators and models and the incorporation of these into stock assessments and Plan Team, SSC and NPFMC evaluation process allow for the ongoing development of management measures to achieve the management objectives. These may include precautionary adjustments of TACs and designation of essential habitat for mammalian predators.

Evidence Basis:
The ecosystem indicators and other ecosystem modelling information used in the SAFE assessments, endangered species management plans, and the outcomes of SSC and NPFMC evaluations are all publicly available on the NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NMFS 2012: https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm
NOAA 2019: https://www.integratedecosystemassessment.noaa.gov/regions/alaska/ebs-integrated-modeling
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.7.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).	There is insufficiently **effective** introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978	There is moderately **effective** introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978	The State has introduced and enforces laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).

Lacking in all parameters.	relating there to (MARPOL 73/78). **Lacking in two parameters.**	relating there to (MARPOL 73/78). **Lacking in one parameter.**	**Fulfils all parameters.**

Evaluation Parameters
Process: The appropriate regulations have been implemented.
Current Status/Appropriateness/Effectiveness: These regulations and their enforcement are effective and in line with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter):

Process:
The United States has enacted the Act to Prevent Pollution from Ships of 1980, implementing the provisions of MARPOL annexes to which the United States is a party. The Act is applicable to all U.S.-flagged ships anywhere in the world and to all foreign-flagged vessels operating in navigable waters of the United States or while at port under U.S. jurisdiction. Regulations are produced by the Environmental Protection Agency in consultation with the U.S. Coast Guard. Relevant laws and accompanying regulations to implement MARPOL 73/78 have been introduced through federal legislation and agencies.

Specifically, all fishing vessels operating in federal waters are required to comply with MARPOL Annex V, which specifically prohibits the at-sea disposal of all plastics. Vessels operating in the North Pacific therefore have 3 options: 1) non-plastics can be disposed of at sea within the legal restrictions, 2) they can incinerate wastes onboard the vessel, or 3) they can hold the wastes for shoreside disposal at port. Vessels are required to post oil pollution and garbage placards; have a written solid waste management plan that describes procedures for collecting, processing, storing, and discharging garbage; and have a designated person in charge of carrying out the plan. Together with Coast Guard inspections, observers are also tasked with monitoring for compliance with these Code of Federal Regulations.

Current Status/Appropriateness/Effectiveness:
The United States has demonstrably introduced and continues to enforce laws and regulations based on MARPOL 73/78.

Evidence Basis:
Laws and regulations are publicly available to view. The U.S. Coast Guard and observer program have each been reviewed elsewhere in the standard, and both are considered to be effective in enforcing regulations.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
96th US Congress. 1980. An Act to implement the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and for other purposes.
Code of Federal Regulations 2012: https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol2/xml/CFR-2012-title33-vol2-part155.xml
Code of Federal Regulations 2001: https://www.govinfo.gov/content/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml

Non-Conformance Number (if relevant):

12.9	There shall be knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved shall be avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat shall be considered, not

just that part of the spatial range that is potentially affected by fishing.

FAO Eco (2009) 31.3

FAO Eco (2011) 41.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. **Lacking in all parameters.**	There is an **insufficient** knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. **Lacking in two parameters.**	There is a **moderate** knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. **Lacking in one parameter.**	There is knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved are avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat are considered, not just that part of the spatial range that is potentially affected by fishing. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place by which the potential impacts of the fishery upon habitats essential to the stock under consideration and on habitats that are highly vulnerable to damage are identified. This or a similar mechanism shall also be in place to identify habitats which are highly vulnerable to fishery activities by the Unit of Certification. The information provided by these mechanisms shall be used to produce specific management objectives related to avoiding significant negative impacts on habitats. The knowledge of the habitats in question can therefore include relevant traditional, fisher or community knowledge, provided its validity can be objectively verified (i.e. the knowledge has been collected and analysed though a systematic, objective and well-designed process, and is not just hearsay). When identifying highly vulnerable habitats, their value to ETP species shall be considered, with habitats essential to ETP species being categorized accordingly.

Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter):

Process:

The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to "prevent, mitigate or minimise, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to habitat areas of particular concern (HAPC). Each NPFMC FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

As part of the 2015 review, EFHs throughout the EBS, AI and GOA (i.e., the full spatial range) have been modelled for all major species of groundfish and invertebrates based on available information on distributions of eggs, larvae, juveniles, and adults. This information is principally derived from bottom trawl surveys and commercial catch data. This allows the model to predict distributions of EFHs based on percentile distributions of the species abundance. Fishing effects were then added to the model based on existing literature of effects on sediment types and recovery times. This allows prediction on a monthly basis of the extent of impact and recovery on a 5x5m grid. The model specifically includes long-lived

species on deep and rocky habitats.

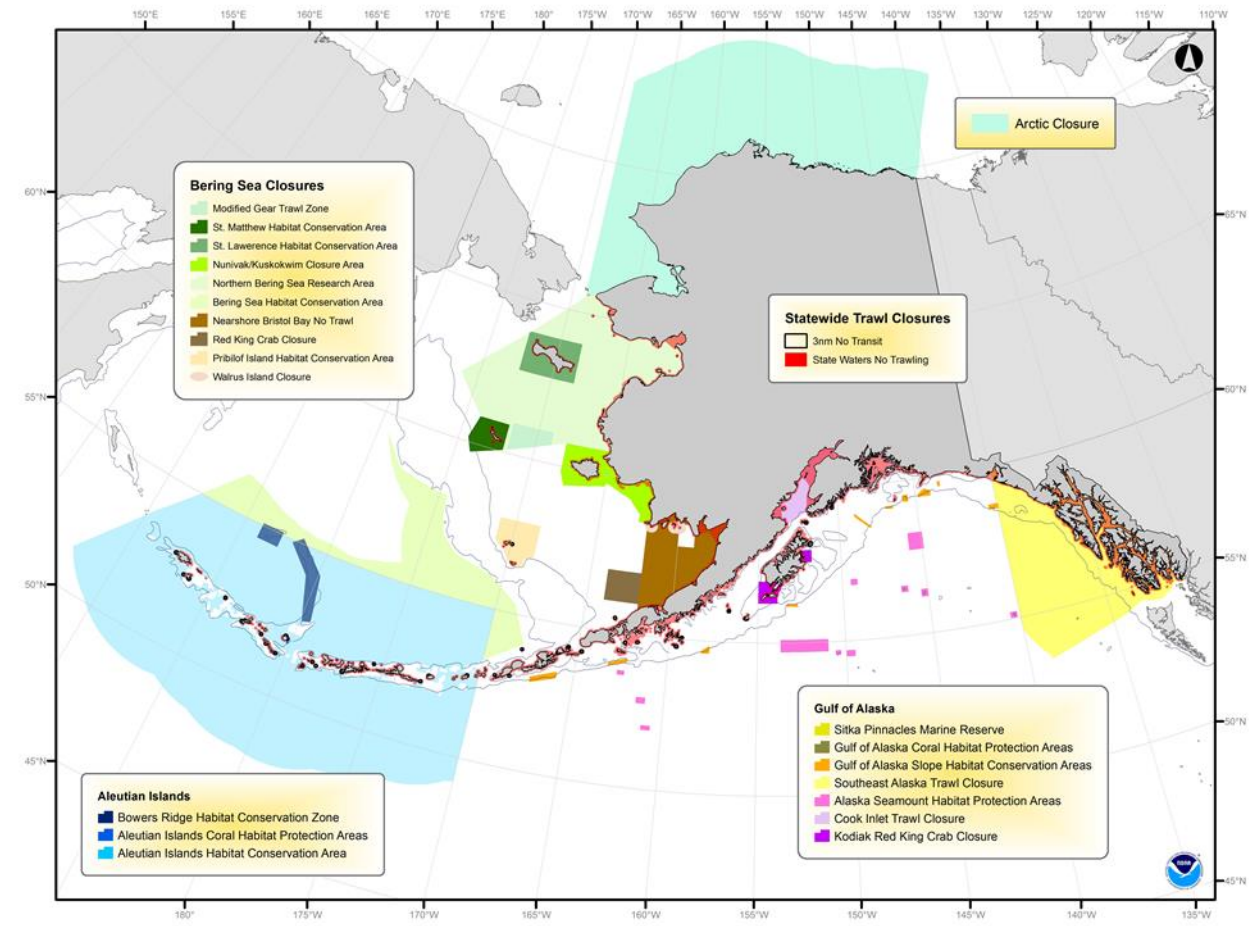
The assessment of impacts first considers whether the stock is above its limit reference point. Mitigation measures would be recommended for any stock below its limit reference point if reductions in EFH are identified as a cause of stock depletion. The next criterion is whether "core EFH area" (CEA) is reduced for each species and life stage. (CEA is generally taken as the 50% quantile threshold of suitable habitat.) If >10% of the CEA is impacted, further analyses are required by stock assessment authors to determine whether there is a significant correlation with life history parameters for the stock to determine any plausible stock effects. Any plausible effects would be investigated by Plan Teams and SSC; if more than minimal and not temporary, these would result in mitigation measures being recommended to the NPFMC. This would result in the NPFMC following its FMP amendment process to mitigate adverse effects. HAPCs are sub-sites with important ecological functions or are especially vulnerable to human impacts. HAPCs are identified to or by the NPFMC according to set priorities (e.g., coral beds, seamounts, skate habitat).

There is a well-defined process in place to model the extent of EFH for each major species and to evaluate, according to set criteria, the effects of fishing. Where such effects may be appreciable, a process to evaluate and mitigate is in place within the NPFMC. An alternative process is in place to identify priority HAPC and to evaluate and protect them. These processes specifically include the effects of trawl fisheries. The information provided by the EFH model may be used to produce and test management measures designed to avoid significant adverse effects. Both scientific trawl survey and commercial catch data are used to inform the model.

Habitat essential to endangered species is identified according to regulatory requirements (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated critical habitat for Steller sea lions in the Aleutian Islands (see Clause 12.5.1).

Current Status/Appropriateness/Effectiveness:
For these flatfish fisheries, all stocks are above their limit reference points. None of the species SAFE reports or the FMPs conclude habitat modification or loss as a concern. Therefore, it can be concluded that the relevant habitats are not affected substantively by these commercial fisheries.

Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and Skate nursery areas (monitoring priority areas). The figure below shows HAPC and other habitat closures in Alaskan waters (Source: NMFS).



Evidence Basis:
FMPs and calls for nominations of HAPC and EFH reviews and methodologies provide fully adequate information on knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them and on habitats that are highly vulnerable to damage by the fishing gear. Information and reports are all publicly available on the NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019e: https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.4.8/ 7.6.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Research is **not** promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in all parameters.**	**Insufficient** research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in two parameters.**	**Moderate** levels of research are promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in one parameter.**	Research is promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities. **Fulfils all parameters.**

Evaluation Parameters
Process: Research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities, as applicable to the fishery.
Current Status/Appropriateness/Effectiveness: There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter):

Process:
The NPFMC overarching policy includes the objective of applying judicious and responsible fisheries management practices, based on sound scientific research and analysis. Also, all management measures are to be based on the best scientific information available.

Key to delivering this scientific evidence base is the work of the Alaska Fisheries Science Center (AFSC). The AFSC has a 3-5 year strategic research plan based on three themes:

1. "Monitor and assess fish, crab, and marine mammal populations, fisheries, marine ecosystems, and the associated communities that rely on these resources." (NMFS 2017c)
2. "Understand and forecast effects of climate change on marine ecosystems." (NMFS 2017c)
3. "Achieve organizational excellence in our administrative activities through innovation and the use of best practices." (NMFS 2017c)

The relevant AFSC research elements include:

1. "Support fishery management through providing core research products used in annual management decisions.
    - 1.1 Maintain the current assessment tier of fish, crab, and marine mammal stocks…
    - 1.2 Support NOAA Fisheries and North Pacific Fishery Management Council analyses and international obligations…
    - 1.3 Create next generation fish, crab, and marine mammal stock assessments and biological and socioeconomic data collections…
    - 1.4 Conduct bycatch analyses and support conservation engineering advances
2. Understand and forecast effects of climate change on marine ecosystems.
    - 2.1 Finalize and implement the Regional Action Plan for Climate Science Strategy in the Southeast Bering Sea
    - 2.2 Develop and implement Regional Action Plans for the Gulf of Alaska and the Aleutian Islands by 2017 and 2019, respectively
    - 2.3 Conduct integrated ecosystem assessments
    - 2.4 Implement NOAA Fisheries' components of NOAA's Arctic Action Plan
    - 2.5 Forecast direct and indirect effects of climate change on fish, crab, and marine mammal species, their habitats, and the associated communities which rely on these resources

3. Achieve organizational excellence in our administrative activities through innovation and the use of best practices.
    3.1 Develop annual resource allocation plans for AFSC based on criteria applied through the AFSC Science Planning and Implementation process. Coordinate result with the Alaska Regional Office (AKR), NOAA Fisheries Headquarters, and the North Pacific Fishery Management Council (NPFMC).
    3.2 Implement annual AFSC staffing plans for FY2017-2022 which aim to achieve a constant, targeted cost of federal labor…
    3.3 Incorporate Data Management Plans into each and every science project. Disseminate environmental data and metadata in a manner consistent with the NOAA Plan for Increasing Public Access to Research Results (PARR)" (NMFS 2017c)

(The GOA Regional Action Plan was developed in 2018. The plan for the Aleutian Islands in still in development.)

It is also noted that research is often promoted and encouraged by academic institutions, furthering the aim of the NPFMC. Research continues into community development associated with fisheries, for example through Amendment 80 cooperatives. Industry is also regularly involved in research, such as investigating ways to minimise salmon bycatch in trawl gear, which is in response to NPFMC objectives for prohibited species.

Overall, research is promoted by the NPFMC on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. This is directly applicable to the groundfish fishery.

Current Status/Appropriateness/Effectiveness:
There is evidence for this research through the research plans of the AFSC but also work carried out by universities and industry that is of relevance to the fishery (such as through the EFH review). The information being collected is considered directly appropriate for overall fisheries management purposes.

Evidence Basis:
The NPFMC objectives, AFSC research plans, and various outputs and work of academic institutions are widely available through respective websites. Research is of high quality and applicability.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Dorn et al. 2018: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-376.pdf
NMFS 2017c: https://www.fisheries.noaa.gov/resource/document/alaska-fisheries-science-center-strategic-science-plan
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2019b: https://www.npfmc.org/management-policies/
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019g: https://www.npfmc.org/amendment-80-cooperatives/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

Non-Conformance Number (if relevant):

12.11 There shall be outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).

FAO ECO (2011) 41.1

Low Confidence Rating	**Medium Confidence Rating**	**Medium Confidence Rating**	**High Confidence Rating (Full Conformance)**

(Critical NC)	(Major NC)	(Minor NC)	
There are **not** outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). **Lacking in all parameters.**	There are **insufficiently** effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). **Lacking in two parameters.**	There are **moderately** effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). **Lacking in one parameter.**	There are effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process to set outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).
Current Status/Appropriateness/Effectiveness: There is evidence of outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management, stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
Assessments are carried out (at some level of the NMFS Tier 1-5 assessment process) on all significant non-target fish and invertebrate stocks. Protected species are considered separately. Estimated overfishing levels and Acceptable Biological Catch (ABC) levels for these complexes are reviewed annually. Management plans have been developed for each species or species complex. The process of setting overfishing levels and ABCs is as described in Section 3.3 for each target stock. This involves assessments through the Plan Team meetings, SAFE assessments, and SSC and NPFMC reviews.

Current Status/Appropriateness/Effectiveness:
Overfishing levels and ABCs are set for each species and species complex. No species or complex is being fished beyond the overfishing level. Prohibited species (notably chinook salmon and halibut) are also subject to bycatch caps to help avoid overfishing. It is also noted that environmental monitoring and modelling allows the effects of wider environmental influences to be considered in the setting of indicator levels.

Evidence Basis:
SAFE reports, FMPs, minutes from SSC and NPFM meetings, and Plan Team responses are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/
Non-Conformance Number (if relevant):

12.12 There shall be outcome indicator(s) consistent with achieving management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

FAO ECO (2011) 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in all parameters.**	There are **insufficiently** effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in two parameters.**	There are **moderately** effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in one parameter.**	There are effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process in place that allows for the creation of effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

Current Status/Appropriateness/Effectiveness: There is evidence for established outcome indicators (e.g. in a fishery management plan or other regulation) that seek to ensure that endangered species are protected (through state or federal regulations) from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Management objectives shall be achieved accordingly.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:

The basis of protection of endangered species is the ESA, CITES Appendix I, and the MMPA. The endangered species inhabiting the BSAI and GOA are primarily under the responsibility of the USFWS for seabird species and NMFS for other protected species. For these fisheries, this is primarily marine mammals.

The FMPs specifically address endangered species. FMPs go through the development and review processes described elsewhere. The groundfish FMP management policy specifically includes cooperation

with USFWS to protect ESA-listed species, and if appropriate and practicable, other seabird species; to maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions; to encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate; to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species; to continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species; and to control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures. Assessments of the effects of the Alaska groundfish fisheries on many endangered species are also provided in the Alaska Groundfish Harvest Specifications Environmental Impact Statement.

The ESA requires the relevant agency (NMFS or USFWS) to evaluate (provide a biological opinion) on the effects of the FMPs for the GOA and groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species. Specifically, federal agencies must ensure that their activities are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. The biological opinion process has been followed, as required for Steller sea lion and chinook salmon in relation to these fisheries under assessment.

The MMPA allows for NMFS to issue permits for the taking of marine mammals designated as depleted because of their listing under the ESA after the agency has determined that:

- Incidental mortality and serious injury from commercial fisheries will have a negligible impact on the affected species or stock
- A recovery plan has been developed or is being developed for such species or stock under the ESA
- Where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered, and a take reduction plan has been developed or is being developed for the species or stock

NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries (LOF) according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤1% of the marine mammal's potential biological removal (PBR) level and total fishery-related mortality <10% of PBR. Any fishery in Category III is considered to have achieved the target level of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that is >1% but is <50% of the stock's PBR level, if total fishery related mortality is ≥10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥50% of PRB. The BSAI flatfish trawl fishery is a Category II; the GOA flatfish trawl and BSAI Greenland turbot longline fisheries are Category III. (See Clauses 3.2.4 and 12.5.1 for more details.)

The designation and protection of endangered species is an integral component of the management of groundfish fisheries in BSAI and GOA. Specific outcome indicators are developed in terms of acceptable levels of impacts such that fishing is not likely to jeopardize the continued existence of protected species or destroy or adversely modify designated critical habitat under the ESA or to approach PBR levels for marine mammals under the MMPA.

Current Status/Appropriateness/Effectiveness:
Based on catch data, the endangered, threatened, and protected species that have interacted with the units of certification are as follows:

<u>BSAI flatfish trawl</u>

- Bearded seal (Alaska)
- Gray whale (eastern North Pacific)
- Harbor porpoise (Bering Sea)
- Harbor seal (Bering Sea)
- Humpback whale (western North Pacific)
- Killer whale (Alaska resident)
- Killer whale (GOA, AI, and BS transient)
- Northern fur seal (eastern Pacific)
- Ribbon seal (Alaska)
- Ringed seal (Alaska)

- Salmon (some species)
- Spotted seal (Alaska)
- Steller sea lion (western US)
- Walrus (Alaska)

Of these species, four are also ESA-listed species: bearded seal and ringed seal are both threatened, and humpback whale and Steller sea lion are both endangered. The gray whale and humpback whale are also listed in CITES Appendix I. From the species listed above, only 1 bearded seal, 2 northern fur seals, 1 ringed seal, 1 spotted seal, and 3 Steller sea lions were seriously injured or killed by the BSAI flatfish fishery in 2015 (the most recent year for data). All of these catch numbers are significantly less than the species' PBRs.

The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries. This fishery catches northern fulmars, gulls, kittiwakes, Laysan albatross, and shearwaters, most of which are not endangered, threatened, or protected. Additionally, the catch numbers of these species in this fishery are minimal.

Three ESA-threatened salmon stocks that migrate to Alaskan waters include Lower Columbia River Chinook salmon, upper Willamette River Chinook salmon, and Lower Columbia River Chinook, spring. About 90% of the Chinook salmon bycatch is taken in the pollock fishery, and available data indicate that salmon bycatch in the BSAI flatfish fishery does not pose a threat to ESA-listed salmon populations in the Pacific Northwest.

<u>GOA flatfish trawl</u>

- Harbor seal (Alaska)
- Northern elephant seal (North Pacific)
- Salmon (some species)
- Steller sea lion (western US)

Marine mammals are rarely taken incidentally in the GOA flatfish trawl fishery. The northern elephant seal is the only LOF-listed species caught by the fishery, and according to catch data, none were caught in 2015 (the most recent year for data). The Steller sea lion is not listed on the LOF for the GOA but is an ESA-listed species, and according to catch data, the fishery did catch one in 2015. None of these species is listed in CITES Appendix 1. These catch numbers are significantly less than the species' PBRs.

For seabirds, this fishery catches northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the BSAI flatfish fishery, the GOA flatfish fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

<u>BSAI Greenland turbot longline</u>

- Killer whale (Alaska resident)
- Salmon (some species)

The killer whale is the only species listed on the LOF as relevant to this fishery. While the killer whale is protected by the MMPA, it is not listed on the ESA or CITES Appendix I. Marine mammals are rarely taken incidentally in this fishery. According to the most recent data (2015), the fishery caught one killer whale that year, which is significantly less than the species PBR.

The only seabird caught by this fishery in substantive numbers is the northern fulmar, which is not endangered, threatened, or protected. Additionally, the species catch numbers in this fishery are minimal. Also, as with the other fisheries, this fishery is not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, chinook prohibited species limits have been imposed. The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch are in place to minimise this bycatch.

For all of these units of certification, there are a number of management actions have been implemented to promote the recovery of the western U.S. stock of Steller sea lions; regulations changed the temporal

and spatial distribution of the pollock and cod fisheries such as the establishment of critical habitat included 3 nm no-entry zones around rookeries, prohibition of groundfish trawling in proximity of certain rookeries, and three special aquatic foraging areas in Alaska; the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

Evidence Basis:
FMPs, protected species management plans, and biological opinion reviews are all widely available through NMFS and NPFMC websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive, and rigorous in their analysis.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Helker et al. 2017: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019b: https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables
NMFS 2019c: https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
NMFS 2019d: https://www.fisheries.noaa.gov/resource/document/seabird-bycatch-estimates-alaska-groundfish-fisheries-2018
NMFS 2018c: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act
NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
NMFS 2012: https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm
NMFS 2010: https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska
NMFS 2007: https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-harvest-specifications-environmental-impact-statement-eis
NPFMC 2019b: https://www.npfmc.org/management-policies/
NPFMC 2019f: https://www.npfmc.org/bering-seaaleutian-islands-groundfish/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
USFWS 2017: https://www.fws.gov/midwest/endangered/section7/section7.html

Non-Conformance Number (if relevant):

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

FAO ECO (2011) 41.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** outcome indicator(s) consistent with achieving management objectives for avoidance,	There are **insufficiently** effective outcome indicator(s) consistent with achieving management	There are **moderately** effective outcome indicator(s) consistent with achieving management	There are effective outcome indicator(s) consistent with achieving management objectives for avoidance,

minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. **Lacking in all parameters.**	objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. **Lacking in two parameters.**	objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. **Lacking in one parameter.**	minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.
Current Status/Appropriateness/Effectiveness: There are outcome indicators and management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter):

Process:
The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to "prevent, mitigate or minimise, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to habitat areas of particular concern (HAPC). Each NPFMC FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

The latest EFH review developed a hierarchical impact assessment methodology to operationalise the "more than minimal and not temporary" criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below its limit reference point. For stocks at this level, mitigation measures would be required if the stock assessment author determines that there is a plausible connection to reductions in EFH. The next question is whether the "core EFH area" (CEA; defined as the 50% quantile of EFH) is disturbed by fishing. If so, then stock assessment authors must determine whether critical life-history characteristics of the stock are correlated with the proportion of CEA affected. If correlations suggest a plausible stock effect, plan teams and SSC will consider appropriate mitigation measures to recommend to NPFMC.

HAPCs are designated following a nomination process according to NPFMC priorities. HAPC nominations are generally on a five-year cycle but may be initiated at any time. Previous priorities have been seamounts and undisturbed coral areas; the last process was carried out according to a priority of identifying skate nursery areas. The SAFE reports also include specific indicators of vulnerable habitat (e.g., corals, sponges, sea whips) for which trends are monitored and appropriate mitigation may be implemented as necessary.

The mechanisms developed to identify significant effects on EFH and for identifying HAPC are considered consistent with achieving management objectives for avoidance, minimization, or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. This is further supported by habitat ecosystem indicators considered as part of the SAFE process.

Current Status/Appropriateness/Effectiveness:

The processes for identifying effects on EFH and for designating HAPC have been developed to achieve the objectives described in the process parameter and have been successful in doing so.

Evidence Basis:
Reports on the EFH evaluation methodology, calls for identification of HAPC and identification of designated areas, and SAFE reports are all publicly available on NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019e: https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NPFMC 2019h: https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/
NPFMC 2007: https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf

Non-Conformance Number (if relevant):

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

FAO ECO (2011) 41.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in all parameters.**	There are **insufficiently** effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in two parameters.**	There are **moderately** effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in one parameter.**	There are effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism in place that allows the establishment of outcome indicator(s) consistent

with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. Mortality in Alaska is usually accounted for all removals of given species. The State and federal fish accounting systems operate in depth and make an explicit effort to document all removals, to confirm with regulations in force. The assessors shall ensure that all removals are accounted in the system (fish ticket, eLanding) for stock assessment and management purposes.
Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicators and management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation (per parameter):

Process:
At a fundamental level, the SAFE assessment process provides single-species stock assessments for all target groundfish species in the BSAI and GOA. These stock assessments are informed by highly accurate catch and discard data through state and federal online catch reporting, fish tickets, electronic landing, and observer data. The SAFE process provides ABCs and overfishing limits, which in turn are considered by the SSC and NPFMC in setting TACs for each species.

TAC-setting within the NPFMC demonstrably follows the precautionary principle. This is also informed by the range of ecosystem indicators reported to the plan teams as part of the SAFE process. These indicators include mammalian predators of groundfish (e.g., Northern fur seals, Seller sea lions), which are considered by the stock assessment plan teams, SSC, and NPFMC in setting TACs. For mammalian predators of groundfish, outcome indicators of direct mortality are required by the MMPA and ESA in terms of allowable mortalities.

In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

The mechanisms in place through the catch reporting, observer program, and in-season catch accounting systems ensure that all removals are accounted. These data are then incorporated into the SAFE process, providing ABCs and overfishing limits, and then into the SSC and NPFMC review process in setting stock TACs. These processes also include for ecosystem indicators, including mammalian and fish apex predators. The monitoring and management of fisheries in relation to marine mammal predators includes the setting of mortality limits and additional protection measures, such as fishery exclusion from essential habitat. Developments in ecosystem modelling and multi-species modelling progress are part of the fishery management process.

Current Status/Appropriateness/Effectiveness:
There is evidence from ABCs and overfishing limits for groundfish; precautionary TACs, which include ecosystem indicators; and marine mammal mortality, habitat, and trophic management measures that outcome indicators and management measures are in place that have been developed to achieve the objectives described in the process parameter. In terms of maintaining groundfish populations at sustainable levels and implementing measures to protect mammalian predators, these have been demonstrably successful.

Evidence Basis:
SAFE assessments (including ecosystem indicators) for each species are published annually, together with endangered species management plans, marine mammal monitoring, and management measures. Developments in ecosystem modelling are published in the scientific press and are included in the SAFE assessments, where relevant.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2019g: https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications
NMFS 2012: https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm
NOAA 2019: https://www.integratedecosystemassessment.noaa.gov/regions/alaska/ebs-integrated-modeling
NPFMC 2019h: https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2007: https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

Non-Conformance Number (if relevant):

12.15 There shall be outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration must be reversible and not cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

FAO ECO (2011) 36.9, 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are **not** reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function.	There are **insufficiently** effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are **insufficiently** reversible and cause serious or irreversible	There are **moderately** effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are **moderately** reversible and cause serious or irreversible harm to	There are effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

Lacking in all parameters.	harm to the natural ecosystem's structure, processes and function. **Lacking in two parameters.**	the natural ecosystem's structure, processes and function. **Lacking in one parameter.**	**Fulfils all parameters.**

Evaluation Parameters

Process: There is a process to allow for drafting effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. There is also a process to allow any modifications to the habitat for enhancing the stock under consideration and serious or irreversible harm to the natural ecosystem's structure, processes and function to be reversed.

Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter):

Process:

The preceding clauses have described the ecosystem management applied in BSAI and GOA. This has included setting precautionary TACs for all target species, including groundfish, based on ABC and overfishing levels but also considering trends in ecosystem indicators. In the past, TACs have been adjusted in relation to such trends. This is considered the most significant and effective outcome indicator.

Endangered species, prohibited species, seabirds, and marine mammals are all subject to indicators of status and accompanying limits on mortalities within the groundfish fishery. Habitats are also subject to ongoing monitoring and evaluation by stock assessment authors, Plan Teams, SSC, and NPFMC. EFHs and HAPCs are subject to separate evaluation, designation, mitigation, and monitoring. There are no enhancement activities associated with the groundfish fisheries, including no modifications to the habitat for enhancing the stock under consideration.

Ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

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

Current Status/Appropriateness/Effectiveness:

As outlined previously, objectives, indicators, management measures and ongoing monitoring and ecosystem modelling are all in place to meet the overarching objective of effective ecosystem-based management.

Evidence Basis:

SAFE assessments (including ecosystem indicators and essential fish habitat evaluations) for each species are published annually, together with endangered species management plans, marine mammal monitoring, and management measures. Developments in ecosystem modelling are published in the scientific press and NMFS website. All information is readily available through NMFS and NPFMC

websites.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2019g: https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications
NMFS 2012: https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm
NMFS 2010: https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska
NOAA 2019: https://www.integratedecosystemassessment.noaa.gov/regions/alaska/ebs-integrated-modeling
NPFMC 2019h: https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2007: https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

Non-Conformance Number (if relevant):

All Section 13 NOT Applicable – fishery is not enhanced

13. Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.
FAO CCRF (1995) 9.1.2/9.1.3/9.1.4/9.1.5/9.3.1/9.3.5
FAO Eco (2011) 36.9,38, 39, 40, 41, 43

Section 13 of the standard is only applicable when the fishery under assessment utilizes fisheries enhancement techniques.

13.1 State 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 (and/or traditional, fisher or community objective and verifiable knowledge). Significant uncertainty is to be expected in assessing possible adverse ecosystem impacts of fisheries, including culture and enhancement activities. This issue can be addressed by taking a risk assessment/risk management approach.
FAO CCRF (1995) 9.1.2 FAO Eco (2011) 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The effects of aquaculture on genetic diversity and ecosystem integrity are not evaluated scientifically. Lacking in all parameters.	The effects of aquaculture on genetic diversity and ecosystem integrity are insufficiently evaluated, utilizing best available scientific information. Lacking in two parameters.	The effects of aquaculture on genetic diversity and ecosystem integrity are moderately evaluated, utilizing best available scientific information. Lacking in one parameter.	States promotes 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. Fulfils all parameters.

Process: There is evaluation of the effects of aquaculture development on genetic diversity and ecosystem integrity, based on the best available scientific information.
Current Status/Appropriateness/Effectiveness: The research is deemed appropriate for maintaining genetic diversity and ecosystem integrity. Significant uncertainty is to be expected in assessing possible adverse ecosystem impacts of fisheries, including culture and enhancement activities. This issue can be addressed by taking a risk assessment/risk management approach.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.1.1 In the case of enhanced fisheries, the fishery management system should take due regard of the natural production processes and be appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function.

FAO CCRF (1995) 9.3.1 FAO Eco (2011) 36.9, 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
In the case of enhanced fisheries, the fishery management system does **not** take due regard of the natural production processes and is **not** appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function. **Lacking in all parameters.**	In the case of enhanced fisheries, the fishery management system take **insufficient** regard of the natural production processes and is **insufficiently** appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function. **Lacking in two parameters.**	In the case of enhanced fisheries, the fishery management system take **moderate** regard of the natural production processes and is **moderately** appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function. **Lacking in one parameter.**	In the case of enhanced fisheries, the fishery management system take due regard of the natural production processes and is appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function. **Fulfils all parameters.**

Evaluation Parameters

Process: There are processes through which the management system can take due regard of the natural production processes, and which are appropriate for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, and for minimizing adverse impacts on ecosystem structure and function.

Current Status/Appropriateness/Effectiveness: There is evidence that the management system has taken due regard of the natural production processes (natural and enhanced populations) and is effective for the conservation of genetic diversity, biodiversity, protection of endangered species, maintenance of integrity of aquatic communities and ecosystems, minimizing adverse impacts on ecosystem structure and function.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.2 State shall produce and regularly update aquaculture development strategies and plans, as required, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities.

FAO CCRF (1995) 9.1.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** regularly updated aquaculture development strategies and plans, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities. **Lacking in all parameters.**	Regularly updated aquaculture development strategies and plans, are **insufficiently** appropriate to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities. **Lacking in two parameters.**	Regularly updated aquaculture development strategies and plans, are **moderately** appropriate to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities. **Lacking in one parameter.**	States produce and regularly update aquaculture development strategies and plans, as required, to ensure that aquaculture development is ecologically sustainable and to allow the rational use of resources shared by aquaculture and other activities. **Fulfils all parameters.**

Evaluation Parameters

Process: There are defined strategies and plans for aquaculture development in accordance with ecological sustainability and rational use of resources shared by aquaculture and other activities.

Current Status/Appropriateness/Effectiveness: If studies have concluded that aquaculture developments are ecologically sustainable in the interested unit of certification area, the aquaculture developments allow the rational sharing of resources with other activities.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.2.1 State shall ensure that the livelihoods of local communities, and their access to fishing grounds, are not negatively affected by aquaculture developments.

FAO CCRF (1995) 9.1.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The livelihoods of local communities, and their access to fishing grounds, have been **negatively** affected by aquaculture developments. **Lacking in all parameters.**	Livelihoods of local communities, and their access to fishing grounds, are affected by aquaculture developments to a **significant degree**. **Lacking in two parameters.**	Livelihoods of local communities, and their access to fishing grounds, are affected by aquaculture developments to a **small degree**. **Lacking in one parameter.**	The state ensures that the livelihoods of local communities, and their access to fishing grounds, are not negatively affected by aquaculture developments. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place by which the impacts of aquaculture developments on local communities and access to fishing grounds are predicted and monitored. The outputs of this mechanism are used to define management objectives related to minimizing the negative impacts of aquaculture developments.

Current Status/Appropriateness/Effectiveness: Measures, regulations and policies are in place which have been designed to achieve the objectives described in the process parameter, and have been successful in doing so. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.3 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.

FAO CCRF (1995) 9.1.5/9.2.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Procedures are **not** in place for environmental assessment and monitoring to minimize adverse ecological and related economic and social changes from aquaculture. **Lacking in all parameters.**	Procedures are in place for environmental assessment and monitoring but are **insufficiently** effective to minimize adverse ecological and related economic and social changes from aquaculture. **Lacking in two parameters.**	Procedures are in place for environmental assessment and monitoring but are only **moderately** effective to minimize adverse ecological and related economic and social changes from aquaculture. **Lacking in one parameter.**	The State ensures that the livelihoods of local communities, and their access to fishing grounds, are not negatively affected by aquaculture developments. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place by which the potential environmental impacts of fisheries enhancement and aquaculture are predicted and monitored. This mechanism shall be used to develop management objectives related to the minimization of adverse ecological changes.

Current Status/Appropriateness/Effectiveness: Management measures and regulations are in place which have been developed to achieve the management objectives described in the process parameter, and are successful.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Non-Conformance Number (if relevant):

13.4 With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs shall consider the separate contributions from aquaculture and natural production.

FAO Eco (2011) 43

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs does **not** consider the separate contributions from aquaculture and natural production. **Lacking in all parameters.**	With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs **insufficiently** considers the separate contributions from aquaculture and natural production. **Lacking in two parameters.**	With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs **moderately** considers the separate contributions from aquaculture and natural production. **Lacking in one parameter.**	With due regard to the assessment approach employed, stock assessment of fisheries that are enhanced through aquaculture inputs consider the separate contributions from aquaculture and natural production. **Fulfils all parameters.**

Evaluation Parameters

Process: As appropriate, there is a mechanism for stock assessment of fisheries that are enhanced through aquaculture inputs which considers the separate contributions from aquaculture and natural production.

Current Status/Appropriateness/Effectiveness: There is evidence for stock assessment of fisheries that are enhanced through aquaculture inputs which considers the separate contributions from aquaculture and natural production. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:
Non-Conformance Number (if relevant):

13.5 Any modification to the habitat for enhancing the stock under consideration is reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function.

FAO Eco (2011) 41

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Modifications to the habitat for enhancing the stock under consideration is **not** reversible and cause serious or irreversible harm to the natural ecosystem's structure and function. **Lacking in all parameters.**	Modifications to the habitat for enhancing the stock under consideration is **insufficiently** reversible and may cause serious or irreversible harm to the natural ecosystem's structure and function. **Lacking in two parameters.**	Modifications to the habitat for enhancing the stock under consideration is **moderately** reversible and may cause serious or irreversible harm to the natural ecosystem's structure and function. **Lacking in one parameter.**	Modifications to the habitat for enhancing the stock under consideration is reversible and do not cause serious or irreversible harm to the natural ecosystem's structure and function. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a system that allows for the prevention or reversing of habitat modifications that may cause serious or irreversible harm to the natural ecosystem's structure and function.

Current Status/Appropriateness/Effectiveness: There is evidence that are no or minimal habitat modifications and that these modifications to the habitat for enhancing the stock under consideration are reversible and cause none to insignificant harm to the natural ecosystem's structure and function.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and assessment reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.5.1 Efforts shall be undertaken to minimize the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture including culture based fisheries into waters.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Efforts are **not** undertaken to minimize the harmful effects of introducing nonnative species or genetically altered stocks used for aquaculture, including culture-based fisheries. **Lacking in all parameters.**	Efforts are undertaken but are deemed **insufficient** to minimize the harmful effects of introducing nonnative species or genetically altered stocks used for aquaculture, including culture-based fisheries. **Lacking in two parameters.**	Efforts are undertaken but are deemed **moderately** successful in minimizing the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture, including culture-based fisheries. **Lacking in one parameter.**	Efforts are undertaken to minimize the harmful effects of introducing non-native species or genetically altered stocks used for aquaculture including culture-based fisheries. **Fulfils all parameters.**

Evaluation Parameters

Process: There are introduced non-native species or genetically altered stocks used for aquaculture, including culture based fisheries.

Current Status/Appropriateness/Effectiveness: Efforts are made to minimize recognized harmful issues or effects, and, these efforts are considered effective.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.5.2 Steps shall be taken to minimize adverse genetic disease and other effects of escaped farmed fish on wild stocks.

FAO CCRF (1995) 9.3.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Steps are **not** taken to minimize adverse genetic, disease and other effects of escaped farmed fish on wild stocks. **Lacking in all parameters.**	**Insufficient** steps are taken to minimize adverse genetic, disease and other effects of escaped farmed fish on wild stocks. **Lacking in two parameters.**	**Moderate** steps are taken to minimize adverse genetic, disease and other effects of escaped farmed fish on wild stocks. **Lacking in one parameter.**	Steps are taken to minimize adverse genetic, disease and other effects of escaped farmed fish on wild stocks. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process capable to deal with adverse genetic, disease and other effects of escaped farmed fish on wild stocks.

Current Status/Appropriateness/E**ffectiveness**: The management measures in place are effective in minimizing adverse genetic, disease and other effects of escaped farmed fish on wild stocks.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.5.3 Research shall be promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks, taking into account the critical need to conserve genetic diversity of endangered species.

FAO CCRF (1995) 9.3.5

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Research is **not** promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks. The critical need to conserve genetic diversity of endangered species is **not** taken into account. **Lacking in all parameters.**	Research is **insufficiently** promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks. The critical need to conserve genetic diversity of endangered species is **insufficiently** taken into account. **Lacking in two parameters.**	Research is **moderately** promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks. The critical need to conserve genetic diversity of endangered species is **moderately** taken into account. **Lacking in one parameter.**	Research is promoted to develop culture techniques for endangered species to protect, rehabilitate and enhance their stocks, taking into account the critical need to conserve genetic diversity of endangered species. **Fulfils all parameters.**

Evaluation Parameters

Not applicable if enhancement activities are not geared towards endangered species rehabilitation. **Process**: There is a process in place to recognize if the fishery in question is composed of one or more endangered species in need of rehabilitation.

Current Status/Appropriateness/Effectiveness: Research into rehabilitation techniques for endangered species and the conservation of genetic diversity is being promoted. The research has taken into account the critical need to conserve genetic diversity of endangered species.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.6 State shall protect transboundary aquatic ecosystems by supporting responsible aquaculture practices within their national jurisdiction and by cooperation in the promotion of sustainable aquaculture practices.

FAO CCRF (1995) 9.2.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is **no** support of sustainable aquaculture practices that protect transboundary aquatic ecosystems in accord with international norms. **Lacking in all parameters.**	There is **insufficient** support of sustainable aquaculture practices that protect transboundary aquatic ecosystems in accord with international norms. **Lacking in two parameters.**	There is **moderate** support of sustainable aquaculture practices that protect transboundary aquatic ecosystems in accord with international norms. **Lacking in one parameter.**	States protect transboundary aquatic ecosystems by supporting responsible aquaculture practices within their national jurisdiction and by cooperation in the promotion of sustainable aquaculture practices. **Fulfils all parameters.**

Evaluation Parameters

Process: Management measures are in place to support sustainable aquaculture practices and these are in accord with international practices.

Current Status/Appropriateness/Effectiveness: These measures are effective in promoting national sustainable aquaculture practices.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.7 State shall, with due respect to their neighboring States and in accordance with international law, ensure responsible choice of species, siting and management of aquaculture activities which could affect trans boundary aquatic ecosystems.

FAO CCRF (1995) 9.2.2

Low Confidence	Medium Confidence	Medium Confidence	High Confidence Rating

Rating (Critical NC)	Rating (Major NC)	Rating (Minor NC)	(Full Conformance)
promoted in line with international law, where this could affect transboundary aquatic ecosystems. **Lacking in all parameters.**	promoted in line with international law, where this could affect transboundary aquatic ecosystems. **Lacking in two parameters.**	promoted in line with international law, where this could affect transboundary aquatic ecosystems. **Lacking in one parameter.**	of species, siting and management of aquaculture activities which could affect transboundary aquatic ecosystems. **Fulfils all parameters.**

Evaluation Parameters

Process: Management measures are in place ensuring responsible choice of species, siting and management of aquaculture activities which could affect transboundary aquatic ecosystems.

Current Status/Appropriateness/Effectiveness: There is evidence for the responsible in-country choice of species, sites and management procedures. This is considered effective in minimizing potential risks to transboundary aquatic ecosystems.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.8 State shall consult with their neighboring States, as appropriate, before introducing nonindigenous species into trans-boundary aquatic ecosystems.

FAO CCRF (1995) 9.2.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is **no** appropriate consultation with a neighboring state with adjacent jurisdiction prior to the introduction of exotic species.	There is **insufficiently** appropriate consultation with a neighboring state with adjacent jurisdiction prior to the introduction of exotic species.	There is **moderately** appropriate consultation with a neighboring state with adjacent jurisdiction prior to the introduction of exotic species.	The State consults with their neighboring States, as appropriate, before introducing non-indigenous species into transboundary aquatic ecosystems.

Evaluation Parameters

Process: There is a policy in place dictating the procedure to be followed prior to the introduction of non-indigenous species.

Current Status/Appropriateness/Effectiveness: This policy includes a requirement that neighboring states be consulted prior to the introduction of a non-indigenous species into a transboundary area. If there is evidence that such an introduction has occurred in the past, there shall also be evidence that the policy has been followed.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.9 State shall establish appropriate mechanisms, such as databases and information networks to collect, share and disseminate data related to their aquaculture activities to facilitate cooperation on planning for aquaculture development at the national, sub-regional, regional and global level.

FAO CCRF (1995) 9.2.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** regional public database on aquaculture enterprises compiled with their species and characteristics to facilitate international cooperation.	There is a regional public database on aquaculture enterprises but it is **insufficiently** compiled with their species and characteristics to facilitate	There is a regional public database on aquaculture enterprises but it is **moderately** compiled with their species and characteristics to facilitate	States establish appropriate mechanisms, such as databases and information networks to collect, share and disseminate data related to their aquaculture activities to

Evaluation Parameters

Process: A publically available database has been established.

Current Status/Appropriateness/Effectiveness: The information is disseminated properly and the database is available for public access so to facilitate international cooperation.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.10 State shall cooperate in the elaboration, adoption and implementation of international codes of practice and procedures for introductions and transfers of aquatic organisms.

FAO CCRF (1995) 9.3.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The international code of practice for introductions or transfers of aquatic organisms is **not** observed. **Lacking in all parameters**	The international code of practice for introductions or transfers of aquatic organisms is **insufficiently** observed. **Lacking in two parameters.**	The international code of practice for introductions or transfers of aquatic organisms is **moderately** observed. **Lacking in one parameter.**	States cooperate in the elaboration, adoption and implementation of international codes of practice and procedures for introductions and transfers of aquatic organisms. **Fulfils all parameters.**

Evaluation Parameters

Process: There is an international code of practice developed.

Current Status/Appropriateness/Effectiveness: The code of practice is being effectively observed by the country of interest.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References:				
Non-Conformance Number (if relevant):				

13.11 States shall, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, encourage adoption and promote the use of appropriate practices/procedures in the selection and genetic improvement of brood stocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae, fry, brood stock or other live materials. States shall facilitate the preparation and implementation of appropriate national codes of practice and procedures to this effect.

FAO CCRF (1995) 9.3.3, 9.3.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The State, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, has **not** encouraged adoption of appropriate practices in the genetic improvement of brood stocks, the introduction of non-native species, the production, sale and transport of eggs, larvae or fry, brood stock, or other live materials, and in the preparation and implementation of appropriate national codes of practice and procedures to this effect. **Lacking in all parameters.**	The State, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, has **insufficiently** encouraged adoption of appropriate practices in the genetic improvement of brood stocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae or fry, brood stock, or other live materials, and preparation and implementation of appropriate national codes of practice and procedures to this effect. **Lacking in two parameters.**	The State, in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, has **moderately** encouraged adoption of appropriate practices in the genetic improvement of brood stocks, the introduction of non-native species, the production, sale and transport of eggs, larvae or fry, brood stock, or other live materials, and in the preparation and implementation of appropriate national codes of practice and procedures to this effect. **Lacking in one parameter.**	The State in order to minimize risks of disease transfer and other adverse effects on wild and cultured stocks, encourage adoption of appropriate practices in the genetic improvement of brood stocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae or fry, brood stock or other live materials. States facilitate the preparation and implementation of appropriate national codes of practice and procedures to this effect. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place to assess and monitor the risks of disease transfer and other adverse effects on wild and cultured stocks, codified as management objectives in a code of practice or set of procedures.

Current Status/Appropriateness/Effectiveness: Management measures shall be implemented to achieve the objectives described in the code of practice, and there is evidence of their success at doing so. Care is taken to avoid both movement of genotypes or species between catchment areas, river or lake systems, and contamination of local wild genotypes from hatchery animals of the same species. Appropriate practices have been adopted for the genetic improvement of brood stocks to avoid impoverishment of their genetic pool. Appropriate procedures are being published for the selection, production, sale, and transport of brood stocks, eggs, larvae, and fry. There has been preparation and implementation of appropriate codes of practice and procedures to accomplish the above mentioned items.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and

reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.12 Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes should be managed and developed according to the above provisions, especially in relation to maintaining the integrity of the environment, the conservation of genetic diversity, disease control, and quality of stocking material.

FAO Eco (2011) 36.8, 40

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes is **not** managed and developed in accordance with provisions entailing the maintenance of environmental integrity, the conservation of genetic diversity, disease control, and quality of stocking material. **Lacking in all parameters.**	Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes is **insufficiently** managed and developed in accordance with provisions entailing the maintenance of environmental integrity, the conservation of genetic diversity, disease control, and quality of stocking material. **Lacking in two parameters.**	Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes is **moderately** managed and developed in accordance with provisions entailing the maintenance of environmental integrity, the conservation of genetic diversity, disease control, and quality of stocking material. **Lacking in one parameter.**	Enhanced fisheries may be supported in part by stocking of organisms produced in aquaculture facilities or removed from wild stocks other than the "stock under consideration". Aquaculture production for stocking purposes is managed and developed according to the above provisions, especially in relation to maintaining the integrity of the environment, the conservation of genetic diversity, disease control, and quality of stocking material. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process in place to develop enhanced fisheries supported in part by stocking of organisms produced in

aquaculture facilities or removed from wild stocks other than the "stock under consideration", whereby aquaculture production for stocking purposes is managed and developed in accordance with provisions entailing the maintenance of environmental integrity, the conservation of genetic diversity, disease control, and quality of stocking material. As appropriate, there are also management objectives and measures consistent with avoiding significant negative impacts of enhancement activities on the natural reproductive stock component of the stock under consideration and any other wild stocks from which the organisms for stocking are being removed.

Current Status/Appropriateness/Effectiveness: These measures are effective. There is evidence of enhancement practices managed and developed in accordance with the maintenance of the integrity of the environment, the conservation of genetic diversity, disease control, and quality of stocking material.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.13 Regarding the enhanced components of the "stock under consideration", provided that a natural reproductive stock component is maintained and fishery production is based primarily on natural biological production within the ecosystem of which the "stock under consideration" forms a part, enhanced fisheries shall meet the following criteria:

- the species shall be native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem;
- there shall be natural reproductive components of the "stock under consideration";
- the growth during the post-release phase shall be based upon food supply from the natural environment and the production system shall operate without supplemental feeding.

FAO Eco (2011) 38

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Regarding the enhanced components of the "stock under consideration", provided that a natural reproductive stock component is maintained and fishery production is	Regarding the enhanced components of the "stock under consideration", provided that a natural reproductive stock component is maintained and fishery production is	Regarding the enhanced components of the "stock under consideration", provided that a natural reproductive stock component is maintained and fishery production is	Regarding the enhanced components of the "stock under consideration", provided that a natural reproductive stock component is maintained and fishery production is based primarily on natural biological

based primarily on natural biological production within the ecosystem of which the "stock under consideration" forms a part, enhanced fisheries **do not** meet the following criteria: 1) the species is native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem; 2) there is a natural reproductive components of the "stock under consideration"; 3) the growth during the postrelease phase is based upon food supply from the natural environment and the production system operates without supplemental feeding. **Lacking in all parameters.**	based primarily on natural biological production within the ecosystem of which the "stock under consideration" forms a part, enhanced fisheries **insufficiently** meet the following criteria: 1) the species is native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem; 2) there is a natural reproductive components of the "stock under consideration"; 3) the growth during the postrelease phase is based upon food supply from the natural environment and the production system operates without supplemental feeding. **Lacking in two parameters.**	based primarily on natural biological production within the ecosystem of which the "stock under consideration" forms a part, enhanced fisheries **moderately** meet the following criteria: 1) the species is native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem; 2) there is a natural reproductive components of the "stock under consideration"; 3) the growth during the postrelease phase is based upon food supply from the natural environment and the production system operates without supplemental feeding. **Lacking in one parameter.**	production within the ecosystem of which the "stock under consideration" forms a part, enhanced fisheries meet the following criteria: 1) the species is native to the fishery's geographic area or introduced historically and have subsequently become established as part of the "natural" ecosystem; 2) there is a natural reproductive components of the "stock under consideration"; 3) the growth during the post-release phase is based upon food supply from the natural environment and the production system operates without supplemental feeding. **Fulfils all parameters.**

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

13.14 In the case of enhanced fisheries, the "stock under consideration" may comprise naturally reproductive components and components maintained by stocking. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration":

- naturally reproductive components of enhanced stocks shall not be overfished;
- naturally reproductive components of enhanced stocks shall not be substantially displaced by stocked components. In particular, displacement shall not result in a reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest.

FAO Eco (2011) 39

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
In the case of enhanced fisheries, the "stock under consideration" may comprise naturally reproductive components and components maintained by stocking. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration": 1) naturally reproductive components of enhanced stocks **are** overfished; and 2) naturally reproductive components of enhanced stocks **are** substantially displaced by stocked components. In particular, displacement **results** in a reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest. **Lacking in all parameters.**	In the case of enhanced fisheries, the "stock under consideration" may comprise naturally reproductive components and components maintained by stocking. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration": 1) the **majority** of naturally reproductive components of enhanced stocks **are** overfished; and 2) naturally reproductive components of enhanced stocks **are often** substantially displaced by stocked components. In particular, displacement **results** in a **significant** reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest. **Lacking in two parameters.**	In the case of enhanced fisheries, the "stock under consideration" may comprise naturally reproductive components and components maintained by stocking. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration": 1) significant **few** of the naturally reproductive components of enhanced stocks **are** overfished; 2) **significant few** naturally reproductive components of enhanced stocks **are** substantially displaced by stocked components. In particular, displacement **results** in a **minor** reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) defined for the regulation of harvest. **Lacking in one parameter.**	In the case of enhanced fisheries, the "stock under consideration" may comprise naturally reproductive components and components maintained by stocking. In the context of avoiding significant negative impacts of enhancement activities on the natural reproductive components of "stock under consideration": 1) naturally reproductive components of enhanced stocks are not overfished; and 2) naturally reproductive components of enhanced stocks are not substantially displaced by stocked components. In particular, displacement does not result in a reduction of the natural reproductive stock component below abundancebased target reference points (or their proxies) defined for the regulation of harvest.

			Fulfils all parameters.

Evaluation Parameters

Process: There is a process in place to manage the naturally reproductive components and components maintained by stocking of the "stock under consideration", to avoid significant negative impacts of enhancement activities on the naturally reproductive components (for example, overfishing or displacement).

Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that the naturally reproductive components of enhanced stocks are not overfished.

Current Status/Appropriateness/Effectiveness: There is evidence to support that the naturally reproductive components of enhanced stocks are not substantially displaced by stocked components, and specifically not resulting in a reduction of the natural reproductive stock component below abundance-based target reference points (or their proxies) as defined for the regulation of harvest (e.g. escapement goals).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/:

Process:.

Current Status/Appropriateness/Effectiveness:

Evidence Basis:

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

Non-Conformance Number (if relevant):

5.1 References

ADFG 2018, https://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.main
ADFG 2018, https://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.main
ADFG 2018. ADFG Advisory process http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory
ADFG Commercial Fisheries http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherygroundfish.main
AKFIN 2018. http://www.akfin.org/about-akfin
ASFC 2016. Observer manual https://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2016.pdf
ASFC 2018. Observer report for 2018. https://www.afsc.noaa.gov/Publications/ProcRpt/PR2018-07.pdf
ASMI 2018. http://www.asm.com/Downloads/2018_ASMI_Annual_Report.pdf
Cahalan, J., Mondragon, J., Gasper, J., 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska. In: NOAA Tech Memo. NMFSAFSC-286. National Oceanic and Atmospheric Administration, 2015 edition, http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-286.pdf
CFEC 2018 https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2018-2019/akpen/CFEC_memo.pdf
Dorn and Zador, 2018 see https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwjf6b7v_ZPjAhUMa1AKHUUrAW8QFjAAegQIARAC&url=https%3A%2F%2Fcomments.npfmc.org%2FCommentReview%2FDownloadFile%3Fp%3Db678701b-1a11-4841-b89e-3398c51e2967.pdf%26fileName%3DWhen%2520to%2520set%2520ABC%2520less%2520than%2520Max%2520ABC%25204.pdf&usg=AOvVaw3-J0gno30JJXahG-NP9i_2
Fissel et al., 2019. This report will be available at: http://www.afsc.noaa.gov/refm/docs/2018/economic.pdf
Gauvin. 2013 Deck Sorting report https://alaskafisheries.noaa.gov/sites/default/files/efp12-01halibut_a80.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp.pdf
http://www.afsc.noaa.gov/REFM/Stocks/assessments.htm
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/us_russia.html
https://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=harvInfo.stateSubData
https://www.adfg.alaska.gov/sf/sportfishingsurvey/index.cfm?ADFG=area.results
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIkamchatka.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIplaice.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIrocksole.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIturbot.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/BSAIyfin.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAatf.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOAflathead.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/GOArex.pdf
https://www.afsc.noaa.gov/REFM/Docs/2018/GOAnsrocksole.pdf
McDowell 2015. The McDowell Group report http://ebooks.alaskaseafood.org/ASMI_Seafood_Impacts_Dec2015/#/0/
NMFS 1996, MSFCMA http://www.nmfs.noaa.gov/sfa/magact/
NMFS 1996. MSFCMA http://www.nmfs.noaa.gov/sfa/magact/
NMFS 2015. https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf
NMFS 2017. http://www.st.nmfs.noaa.gov/st1/recreational/documents/Intercept_Appendices/Appendix%20M%20031408%20NOAA%20administrative%20order%20216-100.pdf
NMFS 2018. Catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings
NMFS 2019: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS2018 catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings
NPBR, 2016. NPRB GOA project http://www.nprb.org/gulf-of-alaska-project/preliminary-final-results/
NPFMC 2017 EM https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPre-impPlan.pdf
NPFMC 2018. http://www.npfmc.org/committees/rural-outreach-committee/
NPFMC 2018. FMPs http://www.npfmc.org/fishery-management-plans/

NPFMC 2018. NPFMC CDQ Program http://www.npfmc.org/community-development-program/
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC BSAI FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC GOA FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
Ormseth 2018 BSAI skate SAFE https://www.afsc.noaa.gov/REFM/Docs/2018/BSAIskate.pdf
Ormseth 2018 GOA skate SAFE https://www.afsc.noaa.gov/REFM/Docs/2018/GOAskate.pdf
OSRI 2018. http://www.pws-osri.org/wp-content/uploads/2019/02/FY18-Annual-report.pdf
SC 2018. https://access.afsc.noaa.gov/pubs/posters/pdfs/pWilderbuer05_tech-subcommittee.pdf
Siddon et al., 2018. https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/ecosysEBS.pdf
UAF 2018. https://www.uaf.edu/finserv/omb/reports-presentations/
Zador et al., 2018. https://www.afsc.noaa.gov/refm/stocks/plan_team/2018/ecosysAI.pdf
Code of Federal Regulations 2012: https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol2/xml/CFR-2012-title33-vol2-part155.xml
Code of Federal Regulations 2001: https://www.govinfo.gov/content/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml
Dorn et al. 2018: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-376.pdf Dorn, M. W., C. J. Cunningham, M. T. Dalton, B. S. Fadely, B. L. Gerke, A. B. Hollowed, K. K. Holsman, J. H. Moss, O. A. Ormseth, W. A. Palsson, P. A. Ressler, L. A. Rogers, M. A. Sigler, P. J. Stabeno, and M. Szymkowiak. 2018. A climate science regional action plan for the Gulf of Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-376, 58 p.
Federal Register 2019: https://www.federalregister.gov/documents/2019/04/16/2019-07179/fisheries-of-the-exclusive-economic-zone-off-alaska-halibut-deck-sorting-monitoring-requirements-for
Helker et al. 2017: https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
Muto et al. 2019: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region Muto, M. M., V. T. Helker, R. P. Angliss, P. L. Boveng, J. M. Breiwick, M. F. Cameron, P. J. Clapham, S. P. Dahle, M. E. Dahlheim, B. S. Fadely, M. C. Ferguson, L. W. Fritz, R. C. Hobbs, Y. V. Ivashchenko, A. S. Kennedy, J. M. London, S. A. Mizroch, R. R. Ream, E. L. Richmond, K. E. W. Shelden, K. L. Sweeney, R. G. Towell, P. R. Wade, J. M. Waite, and A. N. Zerbini. 2019. Alaska Marine Mammal Stock Assessments, 2018. NOAA Technical Memorandum NMFS-AFSC-393.
Global trust 2014. FAO-based Responsible Fisheries Management Certification Report for the US Alaska flatfish Complex commercial Fisheries. January 2014.
NMFS 2019a: https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures
NMFS 2019b: https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-tables
NMFS 2019c: https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
NMFS 2019d: https://www.fisheries.noaa.gov/resource/document/seabird-bycatch-estimates-alaska-groundfish-fisheries-2018
NMFS 2019e: https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska
NMFS 2019f: https://www.fisheries.noaa.gov/alaska/population-assessments/2018-north-pacific-groundfish-stock-assessments
NMFS 2019g: https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications
NMFS 2019h: https://www.fisheries.noaa.gov/bulletin/nmfs-prohibits-directed-fishing-kamchatka-flounder-bering-sea-and-aleutian-islands-1
NMFS 2019i: https://www.fisheries.noaa.gov/bulletin/nmfs-prohibits-directed-fishing-deep-water-species-vessels-using-trawl-gear-gulf-2
NMFS 2018a: https://www.npfmc.org/wp-content/PDFdocuments/membership/EcosystemCommittee/Meetings2018/NFS_Cons_Plan_Activities.pdf
NMFS 2018b: http://comments.npfmc.org/CommentReview/DownloadFile?p=69bc0355-4b84-4c91-b5ae-f7cf3c2cf975.pdf&fileName=0006_4_B2%20Deck%20Sorting%20RIR%205-25-18.pdf
NMFS 2018c: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act
NMFS 2017a: https://www.afsc.noaa.gov/publications/AFSC-TM/NOAA-TM-AFSC-354.pdf
NMFS 2017b: https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015
NMFS 2017c: https://www.fisheries.noaa.gov/resource/document/alaska-fisheries-science-center-strategic-science-plan

NMFS 2016: https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0
NMFS 2015: https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
NMFS 2012: https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm
NMFS 2010: https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska
NMFS 2007: https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-harvest-specifications-environmental-impact-statement-eis
NOAA 2019: https://www.integratedecosystemassessment.noaa.gov/regions/alaska/ebs-integrated-modeling
NPFMC 2019a: https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/
NPFMC 2019b: https://www.npfmc.org/management-policies/
NPFMC 2019c: https://www.npfmc.org/salmon-bycatch-overview/
NPFMC 2019d: https://www.npfmc.org/crab-bycatch-overview/
NPFMC 2019e: https://www.npfmc.org/halibut-bycatch-overview/
NPFMC 2019f: https://www.npfmc.org/bering-seaaleutian-islands-groundfish/
NPFMC 2019g: https://www.npfmc.org/amendment-80-cooperatives/
NPFMC 2019h: https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf
NPFMC 2018a: https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2018b: https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2018c: https://www.npfmc.org/halibut-deck-sorting-efp-2/
NPFMC 2017: https://www.npfmc.org/programmatic-groundfish/
NPFMC 2007: https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf
Siddon and Zador 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysEBS.pdf
U.S. Army Corps of Engineers 2018: https://www.pebbleprojecteis.com/documents/eis
USFWS 2017: https://www.fws.gov/midwest/endangered/section7/section7.html

Zador and Ortiz 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/BSAI/ecosysAI.pdf
Zador and Yasumiishi 2018: https://www.afsc.noaa.gov/REFM/Docs/2018/GOA/ecosysGOA.pdf

APPENDICES

Appendix 1 Stakeholder submissions

No stakeholder comments were received during announced consultation opportunities.

Appendix 2 Peer Review

Peer Reviewer A Comments

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Assessment Team Response**
Justification: Evidence is detailed, thorough and presented in a logical manner. The assessment team has reached the appropriate conclusion to recertify the fisheries with no non-conformances.		

Do you think the non - conformance(s) raised are appropriate to achieve the high level of confidence, assigned to a given supporting clause, within the specified timeframe?	N/A	**Assessment Team Response**
Justification:		

If applicable:

Do you think the client action plan is sufficient to close the non-conformances raised?	N/A	**Assessment Team Response**
Justification:		

Table 21 Supporting clause review:

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance (s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.1	yes	yes	N/A in all clauses		
1.2	yes	Yes			
1.2.1	yes	Yes			
1.3	N/A				

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance (s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.3.1	N/A				
1.4	N/A				
1.4.1	N/A				
1.5	N/A				
1.6	yes	Yes			
1.6.1	N/A				
1.7	yes	Yes			
1.8	yes	Yes			
1.9	N/A				
2.1	yes	Yes			
2.1.1	yes	Yes			
	yes	Yes			
2.2	yes	Yes			
2.3	yes	Yes			
2.4	yes	Yes			
2.5	yes	Yes			
2.6	yes	Yes			
2.7	N/A				

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
2.8	yes	Yes			
3.1	yes	Yes			
3.2.1	yes	Yes			
3.2.2	yes	Yes			
3.2.3	yes	Yes			
3.2.4	yes	Yes			
3.2.5	yes	Yes			
3.2.6	yes	Yes			
4.1	yes	Yes			
4.1.1	yes	Yes			
4.1.2	yes	Yes			
4.2	Yes, mainly	Yes		Any catch by vessels < 40'LOA? If so, is there any obs. coverage or EM?This is an issue in the P. hal fishery.	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. However, there are no cathces of flatfish from vessels smaller than 40 ft. This is added to the justification under supporting clause 4.2.

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
4.3	yes	Yes			
4.4	yes	Yes			
4.5	Yes, mainly	Yes		Should be a ref. to latest Economic SAFE, Fissel et al.	Added
4.6	yes	Yes			
4.7	N/A				
4.8	N/A				
4.9	N/A				
4.10	N/A				
4.11	N/A				
5.1	yes	Yes			
5.1.1	yes	Yes			
5.1.2	yes	Yes		Replace ref. to P.cod	replaced
5.2	yes	Yes		Replace ref. to P.cod	replaced
5.3	yes	Yes			
5.4	N/A				
5.5	yes	Yes		Replace P.cod ref	replaced
6.1	yes	Yes		Last 2 sentences in Evidence: the 3	Amended accordingly

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				"overfish" criteria can be applied to all Tier 1 & 3 stocks.	
6.2	yes	Yes		Reference to the incorrect interpretation of a ref pt in the PA was actually noted in the previous surveill. report (R2019-001, Feb 2019), where the correct interp. was given.	Amended accordingly
6.3	yes	Yes		Replace ref. to P.cod	replaced
6.4	yes	Yes		See note on B20%	Amended accordingly
7.1	yes	Yes			
7.1.1	yes	Yes		Couple of typos in L3 of Evidence	Amended accordingly
7.1.2	Yes, mainly	Yes		Please reference specifically some of the CIE reviews on these FF stocks	References provided
7.2	N/A				
7.3	yes	Yes		See note on B20%	Amended accordingly
8.1	yes	Yes			
8.1.1	yes	Yes		See note on B20%	Amended accordingly
8.1.2	Yes, mainly	Yes		In Current Status, Para 2, much of this	Yes for groundfish which included flatfish species.

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				pertains to P. cod. Are there some specific examples for the flatfish?	8.1.2 amended to "groundfish as faltfish".
8.1.3	yes	Yes			
8.2	yes	Yes			
8.3	yes	Yes			
8.4	yes	Yes			
8.5	yes	Yes			
8.6	yes	Yes			
8.7	yes	Yes			
8.8	yes	Yes			
8.9	yes	Yes		Remove reference to the pollock fisheries.	removed
8.10	yes	Yes			
8.11	N/A				
8.12	yes	Yes			
8.13	yes	Yes			
8.14	N/A				
9.1	yes	Yes			

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
9.2	yes	Yes			
9.3	yes	Yes			
10.1	yes	Yes			
10.2	yes	Yes			
10.3	N/A				
10.3.1	yes	Yes			
10.4	N/A				
10.4.1	N/A				
11.1	yes	Yes			
11.2	yes	Yes			
11.3	N/A				
12.1	Yes, mainly	Yes		See note below on env. considerations	General comments noted and addressed
12.2	yes	Yes			
12.3	yes	Yes			
12.4	yes	Yes			
12.5	yes	Yes			
12.5.1	yes	Yes			
12.6	yes	Yes			

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
12.7	yes	Yes			
12.8	yes	Yes			
12.9	yes	Yes			
12.10	yes	Yes			
12.11	yes	Yes			
12.12	yes	Yes			
12.13	yes	Yes			
12.14	yes	Yes			
12.15	yes	Yes			

General Comments

The report is well written, very comprehensive, and used relevant information to score the clauses and in presenting the evidence and scoring rationale. The evidence is laid out in detail in logical fashion to support the scoring decisions. I do not have any disagreements with the scoring of any clauses. These Alaskan flatfish stocks appear generally to be in very good shape (high biomass and low exploitation), are well managed, and I agree with the overall recommendation by the assessment team to award re-certification.

Although the report is quite lengthy, I do not see any particular need to shorten it, given the numbers of species/fisheries involved. There are some typos in the report, which should be easily found and corrected. One recurring one was the reference to "P. cod" in a number of clauses where "flatfish" was likely meant. In addition, I have made some comments/suggestions for certain clauses in the tables above. Some of the hyperlinks show as "active" while others do not – might just be a text formatting issue.

Assessment team response: amended accordingly.

I would suggest adding some detail on the catches by species, either in the description of the fishery (3.1.1) or stock assessment (3.3) introductory section. The catches for some stocks/species are noted elsewhere and/or in aggregate, but a summary paragraph or table, by species, might be useful. It would help when comparing across species, and in comparing the relatively low catches to the ABC values. A table such as Table 1 or 2 in the last surveillance report represents one approach.

Assessment team response: tables with catches by species are added to section 3.1.1

A number of clauses (e.g. 6.2, 6.4, 7.3, 8.1.1) note the B20% reference point for certain species in the context of prey of Steller sea lions. I don't think this reference point is valid for the flatfish species in this report, but it is likely worth mentioning somewhere as an ecosystem consideration.

Assessment team response: noted and B20% reference point is removed

In Tables 3 and 4, for the arrowtooth flounder, the 2017 SAFE documents are referenced, whereas the 2018 SAFE docs are referenced for all other species.

Assessment team response: both references are corrected to 2018 SAFE reports

Section 3.8 (External factors), notes the warmer Alaskan waters in recent years. This seems to be an important environmental consideration, given reported declines/mortality in other species such as P.cod, seabirds, forage species, etc. Is it worth expanding the discussion a little, and/or finding an appropriate clause (12.1 perhaps) to discuss this? Not that it would affect any scoring decisions, but perhaps to emphasize that the science and management organizations are paying attention to this. An example of the considerations ongoing in NPFMC/SSC can be seen in pages 2-3 of the BSAI Yellowfin sole SAFE for 2018.

Assessment team response: As noted in Section 3.8, current conditions have been unusually warm with sea surface temperatures as much as 3° C (about 5.4° F) higher than average. Additionally, in recent years, the annual ice cover in the BS has decreased dramatically, which has likely had an effect on several species' survivability and reproductive success. These changes, while not yet fully understood by the scientific community, are being investigated. The NPFMC's SSC and the Groundfish Plan Teams are considering these factors on an ongoing basis as they assess the groundfish stocks (e.g., BSAI yellowfin sole 2018 SAFE report). Clause 12.1 is updated with the justification above.

Have there been any major changes in survey results for flatfish, either in abundance levels, changes in distribution, or biological characteristics, possibly related to the warming conditions? I believe this was important recently for some species, such as P. cod. A paper by Barbeaux and Hollowed (2018) examined climate variability and effects on fish distribution in the eastern Bering Sea for a number of species, including some flatfish. Maybe some info in the SAFE documents as well? Seems like this issue is worth a mention somewhere in the report.

Assessment team response: It is important to stress that some flatfish, may experience range extension or stock level increases due to climate drivers. Commercially valuable flatfish stocks are under-going changes in distribution, abundance, and behaviors. Any projections for stock abundances in the future are very tentative, and observed trends may be specific to regions or locations. Major abundance shifts, if they do occur, will develop over a period of decades (see: https://alaskaseagrant.org/wp-content/uploads/2018/02/Climate-Change-and-Fisheries_Johnson_WEB.pdf).

Peer Reviewer B Comments

Summary of Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Assessment Team Response**
Justification: The report provides a comprehensive review of the flatfish fisheries against the requirements of the RFM standard. There are a few areas where additional information should be provided but all conclusions are considered sound.		

Do you think the non - conformance(s) raised are appropriate to achieve the high level of confidence, assigned to a given supporting clause, within the specified timeframe?	**Yes**	**Assessment Team Response**
Justification: No non-conformances are identified.		

If applicable:

Do you think the client action plan is sufficient to close the non-conformances raised?	**NA**	**Assessment Team Response**
Justification: There are no non-conformances and so an action plan is not required.		

Table 22 Supporting clause review:

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.1	Yes	Yes	NA	It is noted that the evaluation does not address the evaluation parameters specifically, although all necessary information is considered.	
1.2	Yes	Yes	NA	Assessment supported	
1.2.1	Yes	Yes	NA	Assessment supported	
1.3	NA	NA			
1.3.1	NA	NA			
1.4	NA	NA			
1.4.1	NA	NA			
1.5	NA	NA		It may be useful to note the wider extent of cooperation with Canada and Russia where applicable	Clause 1.5 is "Not Applicable" – as none of the stocks are considered to be a transboundary, straddling, highly migratory or high seas stock.
1.6	Yes	Yes	NA	Assessment supported	
1.6.1	NA	NA			
1.7	Yes	Yes	NA	Assessment supported	
1.8	Yes	Yes	NA	Assessment supported	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.9	Yes	Yes	NA	Assessment supported	
2.1	Yes	Yes	NA	Assessment supported	
2.1.1	Yes	Yes	NA	Assessment supported	
2.1.2	Yes	Yes	NA	Assessment supported	
2.2	Yes	Yes	NA	Assessment supported	
2.3	Yes	Yes	NA	Assessment supported	
2.4	Yes	No	NA	The process justification does not seem to relate to the clause; the other text does.	It does as it requires a process that allows for fishery related information to be disseminated.
2.5	Yes	Yes	NA	Assessment supported	
2.6	Yes	Yes	NA	Assessment supported	
2.7	NA	NA			
2.8	Yes	Yes	NA	Assessment supported	
3.1	Yes	Yes	NA	Assessment supported	
3.2.1	Yes	Yes	NA	Assessment supported	
3.2.2	Yes	Yes	NA	Assessment supported	
3.2.3	Yes	Yes	NA	Assessment supported	
3.2.4	Yes	Yes	NA	Assessment supported	
3.2.5	Yes	Yes	NA	Assessment supported	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
3.2.6	Yes	Yes	NA	Assessment supported	
4.1	Yes	Yes	NA	Assessment supported	
4.1.1	Yes	Yes	NA	Assessment supported	
4.1.2	Yes	Yes	NA	Assessment supported	
4.2	Yes	Yes	NA	Assessment supported	
4.3	Yes	Yes	NA	Assessment supported	
4.4	Yes	Yes	NA	Assessment supported	
4.5	Yes	Yes	NA	Assessment supported	
4.6	Yes	Yes	NA	Assessment supported	
4.7	NA	NA			
4.8	NA	NA			
4.9	NA	NA			
4.10	NA	NA			
4.11	NA	NA			
5.1	Yes	Yes	NA	Assessment supported	
5.1.1	Yes	No	NA	It may be better to note that this clause is not relevant, or provide more justification?	This clause is relevenat and scored with full confedence. See requirement under evaluation parameters note: if the fishery for the stock under consideration

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
					has sufficient data collected through regular stock assessment activities for its management then this clause can be scored with full conformance.
5.1.2	Yes	Yes	NA	Assessment supported	
5.2	Yes	Yes	NA	Assessment supported	
5.3	Yes	Yes	NA	Assessment supported	
5.4	NA	NA			
5.5	Yes	Yes	NA	Assessment supported	
6.1	Yes	No	NA	Although the outcome is probably not affected, the reference to P cod should be corrected to flatfish stocks.	Corrected accordingly.
6.2	Yes	Yes	NA	Assessment supported	
6.3	Yes	Yes	NA	Assessment supported	
6.4	Yes	Yes	NA	Assessment supported	
7.1	Yes	Yes	NA	Assessment supported	
7.1.1	Yes	Yes	NA	Assessment supported	
7.1.2	Yes	Yes	NA	Assessment supported	
7.2	NA	NA			

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
7.3	Yes	Yes	NA	Assessment supported	
8.1	Yes	Yes	NA	Assessment supported	
8.1.1	Yes	Yes	NA	Assessment supported	
8.1.2	Yes	Yes	NA	Assessment supported	
8.1.3	No	No	NA	The high confidence rating asks for "Studies are promoted which provide an understanding of the costs, benefits and effects of alternative management options": the AM80 process is relevant, but wider consideration should be shown – e.g. reviews of AM80 effectiveness?	Assessment team consider justification provided to be correct. None of the evaluation parameters under clause 8.1.3 require to evaluate the reviews of effectivness.
8.2	Yes	Yes	NA	Assessment supported	
8.3	Yes	Yes	NA	Assessment supported	
8.4	Yes	Yes	NA	Assessment supported	
8.5	Yes	No	NA	The 'Process' evaluation needs to be properly included	Addressed. Justification for process was missing "proccess" title.
8.6	Yes	Yes	NA	Assessment supported	
8.7	Yes	No	NA	Reference should also be made in 'process' and 'status' to measures to preserve essential fish habitat	References given in the reference box apply to all evaluation parameteres, including process and status.

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
8.8	Yes	Yes	NA	Assessment supported	
8.9	No	No	NA	It should be added that marine pollution is controlled and any lost-gear recovery procedures should be referenced. Lost gear and ghost fishing by longlines should also be addressed	There have been no cases of gear loss in the client fishery in the last years. References provided in the reference box apply to all gears used in this fishery.
8.10	Yes	Yes	NA	Assessment supported	
8.11	NA	NA			
8.12	Yes	Yes	NA	Assessment supported	
8.13	Yes	Yes	NA	Assessment supported	
8.14	NA	NA			
9.1	Yes	Yes	NA	Assessment supported	
9.2	Yes	Yes	NA	Assessment supported	
9.3	Yes	Yes	NA	Assessment supported	
10.1	Yes	Yes	NA	Assessment supported	
10.2	Yes	Yes	NA	Assessment supported	
10.3	NA	NA			
10.3.1	NA	NA			
10.4	NA	NA			

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
10.4.1	NA	NA			
11.1	Yes	Yes	NA	Assessment supported	
11.2	Yes	Yes	NA	Assessment supported	
11.3	NA	NA			
12.1	Yes	Yes	NA	Assessment supported	
12.2	Yes	Yes	NA	Assessment supported	
12.3	Yes	Yes	NA	Assessment supported	
12.4	Yes	Yes	NA	Assessment supported	
12.5	Yes	Yes	NA	Assessment supported	
12.5.1	Yes	Yes	NA	Assessment supported	
12.6	Yes	Yes	NA	Assessment supported	
12.7	Yes	Yes	NA	Assessment supported	
12.8	Yes	Yes	NA	Assessment supported	
12.9	Yes	Yes	NA	Assessment supported	
12.10	Yes	Yes	NA	Assessment supported	
12.11	Yes	Yes	NA	Assessment supported	
12.12	Yes	Yes	NA	Assessment supported	
12.13	Yes	Yes	NA	Assessment supported	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
12.14	Yes	Yes	NA	Assessment supported	
12.15	Yes	Yes	NA	Assessment supported	

General Comments

P33 last para formatting should be checked (line breaks)

Page breaks would be easier between sections and would prevent formatting issues

Assessment team response: amended accordingly.

About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter and greener.