WHEN TRUST MATTERS

SURVEILLANCE NO. 1

Alaska Flatfish Complex Fishery

Alaska Seafood Cooperative

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Report title:	Report for the Alaska Flatfish Complex Fishery	
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Objective:

The objective of this report is the first surveillance audit of the Alaska Flatfish Complex Fishery against the Responsible Fisheries Management (RFM) standard version 1.3.

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Keywords:
RFM, Alaska, flatfish

Reference to part of this report which may lead to misinterpretation is not permissible.

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GLOSSARY

Abbreviations and Acronyms

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
ASMI	Alaska Seafood Marketing Institute
AWT	Alaska Wildlife Troopers
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
CIE	Center for Independent Experts
C/P	Catcher/Processor
CSC	Certified Seafood Cooperative
DPS	Distinct Population Segment
EBS	Eastern Bering Sea
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing Mortality
FAO	Food and Agriculture Organization of the United Nations
FMP	Fishery Management Plan
GOA	Gulf of Alaska
HCR	Harvest Control Rule
LLP	License Limitation Program
M	Natural Mortality
MCS	Monitoring, Control, and Surveillance
MRA	Maximum Retainable Allowance
MSA	Magnuson-Stevens Fisheries Management and Conservation Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
mt	Metric tons
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC (the Council)	North Pacific Fishery Management Council
NPRB	North Pacific Research Board
OFL	Overfishing Level
OLE	Office of Law Enforcement
OY	Optimum Yield
PA	Precautionary Approach
PBR	Potential Biological Removal
PSC	Prohibited Species Catch
PWS	Prince William Sound
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation (Report)
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
TSC	Technical Subcommittee
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
VAST	Vector-Autoregressive Spatio-Temporal (Model)

1 SUMMARY AND RECOMMENDATION

1.1 Fundamental Clauses Summary

Fundamental Clause:	Evidence adequacy rating:	Justification:
1: Structured and legally mandated management system	High	The Alaska Flatfish fisheries are managed by the North Pacific Fishery Management Council (NPFMC; the Council) and the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS) in the federal waters (3-200 nautical miles [nm]); and by the Alaska Department of Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, Alaska 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 Fisheries Management and Conservation Act (MSA). Within state waters, ADFG and the BOF manage the flatfish fisheries as "parallel" or state fisheries, conducted under federal total allowable catches (TACs), regulations and management measures. The U.S. Coast Guard (USCG), the NMFS Office of Law Enforcement (OLE), 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	NMFS and the Council 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. 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 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 BOF actively encourage stakeholder participation, and their deliberations are conducted in open, public sessions. The Community Development Quota (CDQ) Program was created by the Council in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries. There are 65 communities within a 50-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 MSA is the primary domestic legislation governing the management of the U.S. marine fisheries. Under the MSA, the Council is authorized to prepare and submit to the Secretary of Commerce an 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 that incorporate the flatfish fisheries in those regions. Both FMPs contain long-term management objectives, reviewed annually by the Council.
4: Fishery data	High	NMFS and 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	NMFS has a well-established institutional framework for research developed within the Alaska Fisheries Science Center (AFSC). Scientists at AFSC conduct research and stock assessments on flatfish in Alaska each year, producing annual 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 2020 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 harvest control rule	High	The stock assessment (SAFE) volume contains a chapter or sub-chapter for each stock, and contains estimates of all annual harvest specifications except TAC, all reference points needed to compute such estimates, and all information needed to make annual status determinations with respect to “overfishing” and “overfished”. The Council’s 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 (HCRs) specify the maximum 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 Minimum Stock Size Threshold (MSST) (e.g., B17.5%), a rebuilding plan must be established to bring the biomass back to the B_{MSY} level (biomass relative to maximum sustainable yield [MSY]) within a specified timeframe. For the 13 flatfish stock assessments reviewed in this report, 11 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 Alaska 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 OFL, ABC, and TAC system.
8: Management measures to produce maximum sustainable levels	High	The MSA is the federal legislation that defines how fisheries off the U.S. Exclusive Economic Zone (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 Council's 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 the Council's 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 (prohibited species catch [PSC] limits, maximum retainable allowances [MRAs], gear modifications, and 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). 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. Bycatches, discards, and PSCs 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 on board vessels, USCG boardings and inspection activities. The USCG and NMFS 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 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, and 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. 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 Council, NOAA (NMFS), and other relevant organizations 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). FMPs, 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	Not an enhanced fishery.

1.2 Audit Conclusion

Fishery	Status of certification	Comment
Alaska flatfish complex commercial fishery, incllluding 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 nm EEZ) and principally managed by two federal agencies, NMFS and the Council	**Certified**	Following the results of the 1st surveillance audit finalized in May 2021, the assessment team concludes that the RFM Certificate for this fishery shall remain active until the certificate expiry date of December 3, 2024.

2 GENERAL INFORMATION

Table 1. General information

Fishery name	Alaska Flatfish Complex Fishery			
Units of Assessment	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*) GOA Southern rock sole *(Lepidopsetta bilineatus)* GOA Rex sole *(Glyptocephalus zachirus)*		
	Geographic Location:	GOA and BSAI within Alaska jurisdiction (200 nm EEZ)		
	Gear Types:	Bottom trawl and longline		
	Principal Management Authority:	Federal (NMFS and the Council) and state (ADFG and BOF)		
Date certified	November 18, 2016		Date of certificate expiry	December 3, 2024
Surveillance type	Off-site surveillance/document review			
Date of surveillance audit	February-April 2021			
Surveillance stage	1st Surveillance	**X**		
	2nd Surveillance			
	3rd Surveillance			
	4th Surveillance			
	Other (expedited, etc.)			
Surveillance team	Lead assessor: Jodi Bostrom Assessor: Giuseppe Scarcella			

This report contains the findings of the first annual RFM Fisheries surveillance audit conducted for the Alaska flatfish complex fishery during February-April 2021.

The Alaska RFM program is a voluntary program that has been developed by the Alaska Seafood Marketing Institute (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. The RFM standard is now owned and managed by the Certified Seafood Cooperative (CSC).

This assessment is based on the fundamental clauses specified in the Alaska RFM Conformance Criteria v1.3. It is based on six major components of responsible management derived from the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries (FAO CCRF 1995) and Guidelines for the Eco-labeling of products from marine capture fisheries (2009). The fundamental clauses are:

A 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

The purpose of this annual Surveillance Report is to:

1. Establish and report on any material changes to the circumstances and practices affecting the original complying assessment of the fishery
2. Monitor any actions taken in response to non-conformances raised in the original assessment of the fisheries
3. Rescore any clauses where practice or circumstances have materially changed since the last audit

3 ASSESSMENT TEAM DETAILS

Name	Qualifications summary
Jodi Bostrom DNV Lead Assessor and main area of responsibility Fundamental clause F (Serious Impacts of the Fishery on the Ecosystem):	Jodi Bostrom is a senior assessor and team leader for MSC Fisheries and RFM Fisheries at DNV Business Assurance. She earned an M.Sc. in Environmental Science from American University and a B.Sc. in Zoology from the University of Wisconsin. She has over five years of experience in MSC fisheries assessment services. Prior to that, she worked for five years at the MSC as a Senior Fisheries Assessment Manager. Among 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 US National Academy of Sciences' Ocean Studies Board where she worked on various projects from fisheries management and policy to bycatch and dredging impacts to eutrophication and sea level rise.
Giuseppe Scarcella Main areas of responsibility Fundamental clause A (The Fisheries Management System), B (Science and Stock Assessment activities), C (The precautionary approach), D (Management measures), and E (Implementation monitoring and control):	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 now Institute for Biological Resources and Marine Biotechnologies. During the years of employment, 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, otolith 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 and Scientific, Technical and Economic Committee for Fisheries for the European Commission. He is author and co-author of more than 50 scientific paper peer reviewed journals and more than 200 national and international technical reports, most of them focused on the evolution of fish assemblages in artificial habitats and stock assessment and fishery management.

4 BACKGROUND TO THE FISHERY

4.1 Fishery Description

No material changes occurred within this fishery since the recertification finalized in December 2019. All information on this fishery could be obtained from the original full assessment report, subsequent surveillance reports, and re-assessment report available for the download at https://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-flatfish/. Catch data are similar to the previous years, and recent data are presented below:

BSAI

Species	Latin name	2020 TAC (metric ton; mt)	2020 Total Catch (mt)
Alaska plaice	*Pleuronectes quadrituberculatus*	17,000	20,078
Arrowtooth flounder	*Atheresthes stomias*	10,000	10,687
Flathead sole	*Hippoglossoides elassodon*	19,500	9,393
Greenland turbot	*Reinhardtius hippoglossoides*	5,300	2,326
Kamchatka flounder	*Atheresthes evermanni*	6,800	7,442
Northern rock sole*	*Lepidopsetta polyxstra*	47,100	23,842
Yellowfin sole	*Limanda aspera*	150,700	133,798

* includes both northern and southern rock sole

GOA

Species	Latin name	2020 TAC (mt)	2020 Total Catch (mt)
Arrowtooth flounder	*Atheresthes stomias*	96,969	21,124
Flathead sole	*Hippoglossoides elassodon*	28,262	1,911
Northern rock sole*	*Lepidopsetta polyxstra*	44,864	4,362
Southern rock sole*	*Lepidopsetta bilineatus*	44,864	4,362
Rex sole	*Glyptocephalus zachirus*	14,878	1,238

* managed as “shallow water flatfish”

4.2 Original Assessment and Previous Surveillance Audits

The Alaska flatfish complex fishery was first certified under the requirements of the Alaska RFM standard v1.2 on December 5, 2013. The initial certification and first two annual surveillance audits were carried out by the certification body Global Trust.

On November 18, 2016, the certificate for this fishery was transferred from Global Trust to DNV GL (recently renamed DNV). The third and fourth surveillance audits were carried out by DNV. 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 December 4, 2018 to December 4, 2019. The permission for certificate extension was granted by ASMI. This re-assessment did not result in any changes in the compliance of the fishery with the RFM standard, and no non-conformities were raised. The new certificate was therefore issued with the validity date until December 3, 2024.

5 THE ASSESSMENT PROCESS

5.1 Meetings Attended

No on-site stakeholder consultancy was carried out during the first surveillance audit. DNV has carefully reviewed the full assessment report, all subsequent surveillance reports, and re-assessment report and has concluded that the low risk nature of the fishery, absence of conditions, and history of excellent compliance with the rules and regulations in the client operations do allow for the remote surveillance audit with the desk review of new information only. Additionally, the ongoing Covid-19 pandemic made an on-site audit not feasible.

5.2 Stakeholder Input

The first annual surveillance audit for this fishery was publicly announced on January 11, 2021. Due to the delay in receiving some necessary information, the start of the audit was postponed until March 2021, which was announced on March 30, 2021. The assessment team received an update from the client covering changes since recertification, but no external stakeholder input was received.

Information is taken from the NMFS 2020 SAFE reports for the Eastern Bering Sea (EBS), AI, and GOA; the NMFS Alaska Regional Office website; the Council's website; and Mary Furuness (NMFS).

6 ASSESSMENT OUTCOME SUMMARY/ FUNDAMENTAL CLAUSES SUMMARIES

6.1 The Fisheries Management System (A)

Fundamental Clause 1.

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

No. supporting clauses	13
Applicable supporting clauses	6
Non-applicable supporting clauses	7 (1.3, 1.3.1, 1.4, 1.4.1, 1.5, 1.6.1, 1.9)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

There have been no material changes since the full assessment.

Considerable resources in the form of stock assessment, ecosystem monitoring and management expertise and capacity, and management organizations and structures (e.g., NMFS Alaska region, the Council, OLE, USCG, Observer Program) are dedicated to fisheries, including the flatfish complex fishery, in Alaska federal waters. National legislation and the regulatory process by which the Council and NMFS are directed and follow, enable the management of the resource at regional and localized levels. The adaptive and consultative management approach adopted by the Council actively promotes stakeholder participation. The NOAA Office of General Council reviews any proposed management action to assure compliance with the MSA. International obligations (e.g., combating illegal, unreported, and unregulated fishing), and the enforcement of federal regulations are upheld by federal departments, such as USCG and OLE. Within state waters, the flatfish fishery is undertaken on a much smaller scale and supported by area specific stock assessment surveys as well as shared information from federal assessments. Technical expertise is available in-house (ADFG) and supported through the participation in and with groups established by the Council. The BOF provides a consultative management approach that offers opportunity for and takes into account stakeholder input. AWT provide input into the development of regulations and are responsible for their enforcement at-sea and ashore.

The BSAI and GOA flatfish stocks are assessed independently using assessment models that take into account all sources of fishing mortality (F) and are based on complete catch reporting systems including extensive observer data. Catch at age models synthesize data on biomass and age composition from the fishery and integrated trawl surveys conducted by the AFSC to estimate the abundance at age of BSAI and GOA flatfish stocks. Each year several assessment models are developed and evaluated by scientists using alternative life history and fishery and survey selectivity assumptions. Additionally, in BSAI and GOA models exploring stock status in relation to changing environmental conditions have also been developed and evaluated, in some of the models also flatfish stocks are considered (Holsman et al. 2020). Each model uses information on the status of the stock and potential effects of current management practices.

The Council routinely reviews its management plans and actions as part of standard operating procedure. The Council's FMPs (NPFMC 2020a, b) explicitly describe the Council's commitment to review management issues and this is reflected in the numerous Council meetings that take place each year. Similarly, the BOF websites have dedicated pages to their public meetings and agendas and outcomes reflect a commitment to review previously agreed management measures.

There is an agreed 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. Cost recovery from certain fleet sectors, including BSAI and GOA flatfish stocks, is also in operation. The MSA authorizes and requires the collection of cost recovery fees for limited access privilege programs. Cost recovery fees recover the actual costs directly related to the management, data collection, and enforcement of the programs. The current groundfish observer program is a further example of management being financially supported through cost recovery. 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.

There are procedures at multiple levels to review management measures, and the MSA is reviewed by Congress every five years and is periodically revised and reauthorized. The adaptive management approach taken in the BSAI and GOA flatfish stocks fisheries requires regular and periodic review. Component parts of the FMPs are regularly reviewed, including outcome indicators, and various levels of Environmental Impact Statements (EISs) 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. Stakeholders are actively encouraged to participate in Council and BOF meetings and, in so doing, opportunity to review management measures is provided. Stock status is reviewed and updated annually, producing SAFE reports for the BSAI and GOA flatfish stocks. ADFG also conducts scientific research and surveys on its state-managed flatfish fisheries. These SAFE reports 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 Council (and NMFS) as well as BOF (and ADFG) provide substantial amounts of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and BOF actively encourage 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 Council and BOF.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. The BSAI and GOA flatfish stocks in Alaska are not considered to be transboundary, straddling, highly migratory, or high seas stocks and so clauses 1.3, 1.3.1, 1.4, 1.4.1, 1.5, 1.6.1, and 1.9 are not applicable.

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.

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.

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

1.3 Where trans-boundary, 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.

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.

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.

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.

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.

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.

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.

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.

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

- Management arrangements
- Decision-making

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 2.

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

No. supporting clauses	10
Applicable supporting clauses	9
Non-applicable supporting clauses	1 (2.7)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

In managing the Alaska flatfish complex fisheries, NMFS, in conjunction with the Council and ADFG, participate in coastal area management-related issues through processes established by the NEPA, which 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 Council and BOF system was designed so that fisheries management decisions are made at the regional level to allow input from affected stakeholders. Council 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 take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development.

The Council 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. 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.

The technical capacities of the federal and state agencies involved in the management of Alaska flatfish complex fisheries are significant, and include internationally recognized scientists, experienced fishery managers and policy makers and

highly professional and trained enforcement officers. Appropriate technical and financial resources are in place. A joint protocol is in place between the Council and ADFG which provides the intent to provide long term cooperative, compatible management systems that maintain the sustainability of the fisheries resources in federal and state waters.

Canada abuts the U.S. border to the south and shares certain fisheries resources; however, the GOA flatfish stocks are not considered to be transboundary. The United States 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 along with Canadian Coast Guard 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 practice (e.g., International Pacific Halibut Commission, Pacific Salmon Treaty, an Agreement between the United States and Canada on enforcement).

The MSA requires the Council and other groups (BOF, ADGF, etc.) to hold public meetings within their respective regions to discuss the development and amendment of FMPs. These meetings are publicized by the Council, and stakeholders are actively encouraged to participate, and management changes allow input from stakeholders. The BOF website publishes information on forth-coming BOF meetings including the “Proposal Book” 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 proposals prior to the meetings. The OLE and AWT put an emphasis on educating and informing stakeholders of new regulatory changes and other important fishery related matters.

The CDQ program was created by the Council 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 program involves eligible communities who have formed six regional organizations, referred to as CDQ groups. There are 65 communities within a 50-mile radius of the BS coastline who participate in the program. The CDQ program allocates a percentage of the BSAI quotas to CDQ groups. 2020 CDQ allocations are reported in tables available at the following links: https://www.federalregister.gov/documents/2020/12/03/2020-26598/fisheries-of-the-exclusive-economic-zone-off-alaska-bering-sea-and-aleutian-islands-proposed-2021 and https://www.fisheries.noaa.gov/alaska/commercial-fishing/2020-2021-alaska-groundfish-harvest-specifications.

The program is reviewed every 10 years, with the last review occurring in 2012. Analysis by the State of Alaska in 2013 determined that each CDQ entity had maintained or improved performance against its objectives. 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.

A considerable amount of monitoring of the coastal environment in Alaska is conducted and supported by multiple federal and state agencies (e.g., NMFS; AFSC; ADFG; universities, such as the University of Alaska Fairbanks’ Institute of Marine Science; and organizations that support and facilitate marine research, such as the North Pacific Research Board [NPRB]). The NPRB have helped fund two major projects in the Alaska region: The Bering Sea Project and the Gulf of Alaska Ecosystem Study. AFSC has established the Ecosystem Monitoring and Assessment Program 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.

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 prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. The Oil Spill Recovery Institute located in the Prince William Sound (PWS) conducts research into oil spills and their effects on the Alaska environment, particularly the natural resources in PWS.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clause 2.7 is not applicable.

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.

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

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.

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.

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.

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.

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.

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 3.

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

No. supporting clauses	8
Applicable supporting clauses	8
Non-applicable supporting clauses	0
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The Council has in place groundfish FMPs (NPFMC 2020a, b) in the Alaska flatfish complex fisheries. Within these FMPs there are nine management and policy objectives, that are reviewed annually. These include preventing overfishing, preserving the food web, and reducing bycatch and waste. The BOF, when developing their initial groundfish management identified guiding principles for the development of these plans, which are considered to be similar to the Council objectives.

The Alaska License Limitation Program (LLP) has been in place since 2000. The intent of the program has been to track fishing records to rationalize the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licenses. The Restricted Access Management 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.

Groundfish licenses are currently required to participate in the BSAI groundfish fisheries in Federal waters of Alaska. Licenses may contain endorsements for both areas (EBS and AI), or one of the two areas. Gear endorsements define what type of gear may be used: non-trawl, trawl, or both. The GOA groundfish fisheries are among the few remaining limited access (not rationalized) fisheries in Alaska.

General state-wide groundfish regulations include a vessel registration requirement, legal gear definitions, bycatch allowances, and requirements for seabird avoidance measures to be used when fishing with longline gear. The state fisheries for Alaska flatfish complex are not closed access fisheries.

The MSA requires that conservation and fisheries management measures prevent overfishing while achieving OY on a continuing basis. NMFS and the Council follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal Alaska flatfish complex fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations (e.g., the OY limits). The fisheries management system is supported by high level science, and management measures have been generally effective in avoiding overfishing and promoting responsible fishing. Objectives for the BSAI and GOA are set out in the FMPs and include the need to take into account socio-economic considerations. Estimates of ex-vessel value by area, gear, type of vessel, and species, are included in the annual Economic Status SAFE report (Fissel et al. 2020), and each stock assessment SAFE also contains extensive economic data.

The 2020 assessments of Alaska flatfish complex stocks are available in SAFE reports, which give extensive histories of the models used in the assessments (Byran and Palsson 2020; Byran et al. 2020a, b; McGilliard et al. 2020; McGilliard and Palsson 2020; Monnahan and Haehn 2020; Ormseth et al. 2020; Shotwell et al. 2020a, b; Spies et al. 2020). The SAFE reports indicate that overfishing is not occurring and that the stocks are not overfished.

The GOA and BSAI FMPs describe management measures designed to take into account the interests of subsistence, small-scale, and artisanal fisheries. Specific FMP management objectives include: the promotion of sustainable fisheries and communities, the promotion of equitable and efficient use of fishery resources and increase Alaska native consultation. Actions have been taken to minimize the bycatch of halibut and salmon, given its importance for subsistence and artisanal fisheries. The fishery dependence of coastal and western Alaska communities was addressed through the creation of the CDQ programs for the BSAI in the early to mid-1990s and the expansion of those programs into the multispecies CDQ program by 1999.

FMPs, protected species management plans, and biological opinion reviews are all supported by well-designed data-gathering programs and analyses, widely available through NMFS and the Council websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

There are mechanisms developed to identify significant effects on essential fish habitat (EFH) and for identifying habitat areas of particular concern and 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. There are processes in place – primarily through FMPs, endangered species management plans and Biological Opinions and EISs of the various plans – that allow for direct and indirect impacts that are likely to have significant (not only serious) consequences to be addressed. There is extensive evidence setting out the evaluation of effects and implementation of management response; this includes SAFE reports, FMPs, Endangered Species Conservation Plans, supporting EIS, and biological opinions. These are all publicly available through NMFS and the Council websites.

Effects on ecosystem aspects are considered more fully under Fundamental Clause 12, addressed below. 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. 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 [ESA]) and marine mammals (Marine Mammal Protection Act).

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses.

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.

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.

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

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

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

6.2 Science and Stock Assessment Activities (B)

Fundamental Clause 4.

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

No. Supporting clauses	13
Supporting clauses applicable	8
Supporting clauses not applicable	5 (4.7, 4.8, 4.9, 4.10, 4.11)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

NMFS and ADFG collect fishery data and conduct fishery independent surveys to assess the Alaska flatfish complex fisheries and ecosystems in GOA and BSAI areas. SAFE reports (see: https://www.fisheries.noaa.gov/tags/north-pacific-groundfish-stock-assessments) provide complete descriptions of the data collected and used in the annual assessments, used to determine stock status and harvest recommendations for Alaska's target stocks. For these fisheries, there is a well-established system that allows for the production, maintenance, regular update, and verification of statistical data. Reporting of commercial catch from both state and federally managed fisheries is done through the Catch Accounting System, a multi-agency (NMFS, International Pacific Halibut Commission, and ADFG) system that centrally collates landings data from shore-based processing and landings operations as well as retained catch observations from individual vessels. Catch reports for previous years can be found on the NMFS and ADFG websites. The Alaska Fisheries

Information Network maintains an analytic database of both state and federal commercial fisheries data in Alaska and provides that data in usable formats.

All data from the state and federally managed Pacific cod fisheries are included in the stock assessments. Relative to commercial catch, there is minimal recreational, personal use, or subsistence fishing for Alaska flatfish complex in Alaska 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 and other regulations, such as closed areas around Steller sea lion rookeries.

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, and all vessels fishing for groundfish in federal Alaska waters are required to carry observers, at their own expense, for at least a portion of their fishing time. Data gathered in the Observer Program 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. NMFS and the Council have developed at-sea electronic monitoring to integrate video monitoring into the Observer Program to improve data collection. On August 8, 2017, NMFS published a final rule to integrate electronic monitoring into the Observer Program (Ganz et al. 2018). Observer coverage in the groundfish fisheries has been at or near 100% for the past several years, while in the GOA, lower coverage rates exist. Detailed annual reports (e.g., Alaska Fisheries Science Center and Alaska Regional Office 2020) from the Observer Program can be found on NMFS website, and provide extensive information on the Observer Program, including observer deployments, coverage rates, data collections, etc.

NMFS and ADFG have extensive scientific databases which include Alaska flatfish complex stocks, and the Council has substantial information on management of target stocks in Alaska waters. These data are made widely available through the agency websites, publications and at various publicly attended meetings. Data on certain aspects of commercial fishing are considered to be confidential, such as individuals or individual vessels in the analysis of fishery catch-per-unit-effort data, depending on the number of individuals or entities involved. Annual economic SAFE reports (e.g., Fissel et al. 2020) on social/cultural/economic value of the Alaska fisheries resources are produced, which include extensive information also about the Alaska flatfish complex fisheries. Individual assessment SAFE reports of flatfish stocks have extensive sections on the economic performance of the fisheries. Alaska supports both ASMI and the Kodiak Seafood and Marine Science Center to stimulate research and to support and distribute the benefits of seafood in human diets

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clauses 4.7, 4.8, 4.9, 4.10, and 4.11 are not applicable.

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.

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.

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.

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

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.

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

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.

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.

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.

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.

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 5.

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

No. Supporting clauses	7
Supporting clauses applicable	6
Supporting clauses not applicable	1 (5.4)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

NMFS has a well-established institutional framework for research developed within the AFSC, which operates several laboratories and Divisions, including the Auke Bay Laboratories in Alaska which conduct scientific research on fish stocks, fish habitats, and the chemistry of marine environments. Peer reviewed stock assessments are done annually and used as the scientific basis to set catch quotas, taking into account uncertainty and evaluating stock status relative to reference points in a probabilistic way. The SAFE reports are compiled annually by the Council and include a volume on Ecosystem Considerations. The SAFE report provides information on the historical catch trend, estimates of MSY or proxy 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. This includes consideration of rebuilding depressed stocks and alternative harvest strategies and related effects on the component species groups.

The SAFE documents are reviewed first by the Council's Groundfish Plan Team, then by the Scientific and Statistical Committee (SSC) and Advisory Panel, and finally by the full Council. 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 MSA. AFSC periodically requests a more comprehensive external review of groundfish stock assessments by the Center for Independent Experts (CIE).

The assessments receive peer review at three levels. The first is internal, in that the Plan Team meets with the assessment staff before, possibly during, and after the assessment is prepared. The first meeting is to scope the options and scenarios that should be explored in the annual assessment, based on the assessment of the previous year(s) and feedback about how the previous year's fishery has unfolded. Meetings between the assessment staff and the Plan Team occur in a somewhat ad hoc manner, depending on what issues may arise during preparation of the assessment. The number of such meetings can vary between years, depending on the number and type of issues that arise in developing the annual assessment, but in recent years have rarely been fewer than five and sometimes as many as nine. As the assessment nears completion, a meeting with the Plan Team is held to review results and presentation material, to be sure that the assessment is ready for presentation to the Council's SSC. In a narrow sense only the final meeting of the NOAA Plan Team and assessment staff might be considered "peer review" of the assessment; but in fact just as "assessment" is both a process and a product, in a slightly broader sense all the meetings between the Plan Team and the assessment staff can be considered part of an internal peer review process, since all of the meetings have the coverage and quality of the assessment as their primary concern. Once the assessment document is complete, each one receives a thorough and largely external review by the SSC. All technical aspects of the assessment and the coverage of issues by alternative model formulations and scenarios are reviewed by the SSC, which can request re-runs or deletion or addition of analyses, as they consider necessary, to have a sound assessment as a basis for subsequent consultation and decision-making. The make-up of the SSC includes both employees of NMFS and independent experts in ecological, economic, and social sciences. However, none has a direct involvement in preparation of the assessment, and all participants are expected to act in their expert capacities rather than as institutional representatives. Thus, the SSC review can be considered an external review of the assessment.

Finally, CIE routinely conducts stock assessment reviews using leading international experts in stock assessments for Alaska fisheries.

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

The Council receives comprehensive presentations on the status of the EBS, AI, and GOA marine ecosystems (Siddon 2020; Ortiz and Zador 2020; Ferriss and Zador 2020) at its SSC and Advisory Panel meetings as part of its annual management process for Alaska 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. EFH is identified for managed fish species, including flatfish stocks. NPRB and the National Science Foundation identifies research priorities and funds studies about the BS 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. An integrated GOA Ecosystem project, also funded by the NPRB, is examining recruitment processes of major groundfish species.

The Oil Spill Recovery Institute was established by U.S. Congress in response to the 1989 Exxon Valdez oil spill and is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova, AK. The Center facilitates and encourages ecosystem studies in the greater PWS region.

The United States cooperates through relevant international organizations, such as the North Pacific Marine Science Organization, to encourage research in order to ensure optimum utilization of all fishery resources. Although the fisheries for flatfish stocks are conducted entirely within the U.S. EEZ, there is also scientific cooperation with neighboring countries such as Canada. The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee (http://www.psmfc.org/tsc2) was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in U.S. and Canadian waters off the West Coast. Representatives from Canadian and U.S. state/provincial 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., Pacific halibut). 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.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clause 5.4 is not applicable.

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.

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.

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.

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.

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

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

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses

Conformance:

Conformance level: High. Non-conformance: None

6.3 The Precautionary Approach (C)

Fundamental Clause 6.

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

No. Supporting clauses	4
Supporting clauses applicable	4
Supporting clauses not applicable	0

Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The Council's groundfish FMPs for BSAI and GOA contain the details on the Council's precautionary approach, including the tier system, HCRs, and 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 target reference points. Based on the information in the 2020 SAFE documents, none of the target stocks had overfishing occurring, as per the standard definitions applied to each stock.

The 2020 SAFE documents (referenced in Fundamental Clause 4 above) provide the status of Alaska flatfish stocks relative to all available 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. Comprehensive annual Ecosystem Reports for BSAI and GOA that look at numerous elements of the Alaska ecosystems (Siddon 2020; Ortiz and Zador 2020; Ferriss and Zador 2020) are presented to the Council.

The following section provides updates on stock assessment and status for each of the BSAI and GOA flatfish stocks, based, in most cases, on the 2020 SAFE documents:

BSAI plaice (Ormseth et al. 2020): Alaska plaice are assessed on a biennial stock assessment schedule as part of the NMFS assessment prioritization plan implemented in 2017. For BSAI partial assessments, an executive summary is presented in 2020 to recommend harvest levels for the next two years. Refer to the 2019 full stock assessment report for further information regarding the stock assessment model (Wilderbuer and Nichol 2019). A statistical age-structured model is used as the primary assessment tool for the BSAI 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 3 projection operates outside the full assessment model by projecting estimates of future female spawning stock biomass (SSB), age 6+ total biomass, ABC and OFL from the full model estimate of 2019 numbers-at-age and weight-at-age.

New data added to the Tier 3 projection model, used to forecast stock condition ahead to year 2032, included an updated 2019 catch estimate (16,163 t) and new catch estimates for 2020 through October 23, 2020. The full-year 2020 catch was estimated by rounding the catch as of October 23 (19,685) upward to 20,000 t based on predicted further accumulation of catch. To estimate future catches through 2032, the catches that corresponded to the average F of the most recent five years were used, as estimated by the 2019 full assessment. There were no changes in assessment methodology since this was an off-cycle year. For 2021, the recommended harvest is the maximum ABC of 31,657 t from the Tier 3 projection model. Reference values for BSAI Alaska plaice are summarized in the following table, with the recommended ABC and OFL values for 2021 in bold.

Quantity	As estimated or *specified last* year for: 2020	2021	As estimated or *recommended this* year for: 2021	2022
M (natural mortality rate)	0.13	0.13	**0.13**	0.13
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	428,800	435,700	**427,587**	430,164
Female spawning biomass (t)	170,800	161,000	**166,528**	160,150
$B_{100\%}$	333,300	333,300	**335,172**	335,172
$B_{40\%}$	133,300	133,300	**134,069**	134,069
$B_{35\%}$	116,600	116,600	**117,310**	117,310
F_{OFL}	0.15	0.15	**0.160**	0.160
$maxF_{ABC}$	0.125	0.125	**0.132**	0.132
F_{ABC}	0.125	0.125	**0.132**	0.132
OFL (t)	37,600	36,500	**37,924**	36,928
maxABC (t)	31,600	30,700	**31,657**	30,815
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
Overfishing	no	n/a	No	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

BSAI arrowtooth flounder (Shotwell et al. 2020a): The 2019 EBS trawl survey estimate increased 13% from the 2018 estimate and is now 27% above average. No 2020 surveys were conducted in the EBS and the AI this year due to Covid-19. Catch for arrowtooth flounder is generally low and has been between 10-18% of the acceptable biological catch (ABC) since 2011 when speciation began in the catch accounting system for this stock. Current catch as of October 25, 2020 is at 13.8% of ABC. The TACs for arrowtooth flounder are generally set well below ABC and have been between 11-27% since 2011. The 2020 ratio of TAC to ABC was 14%.

For the 2021 fishery, we recommend the maximum ABC of 77,349 t from the 2018 accepted model (Model 18.9). This is an 8% increase from last year's ABC of 71,618 t. The projected female SSB for 2021 is 497,556 t and the projected age 1+ total biomass for 2021 is 923,646 t. Female SSB is well above B40% and projected to be stable. Reference values for arrowtooth flounder are summarized in the following table. The stock is not being subjected to overfishing, is not currently overfished, nor is it approaching a condition of being overfished.

Quantity	As estimate or specified last year for: 2020	2021	As estimated or recommended this year for: 2021	2022
M (natural mortality – Male, Female)	0.35, 0.2	0.35, 0.2	0.35, 0.2	0.35, 0.2
Specified/recommended Tier	3a	3a	3a	3a
Projected total (age 1+) biomass (t)	891,959	934,008	923,646	921,074
Female spawning biomass (t) Projected	481,845	478,260	497,556	509,208
$B_{100\%}$	606,237	606,237	558,826	558,826
$B_{40\%}$	242,495	242,495	223,530	223,530
$B_{35\%}$	212,183	212,183	195,589	195,589
F_{OFL}	0.161	0.161	0.160	0.160
$maxF_{ABC}$ (maximum allowable = $F_{40\%}$)	0.136	0.136	0.135	0.135
Specified/recommended F_{ABC}	0.136	0.136	0.135	0.135
Specified/recommended OFL (t)	82,860	84,057	90,873	94,368
*max*ABC (t)	70,606	71,618	77,349	80,323
Specified/recommended ABC (t)	70,606	71,618	77,349	80,323
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

BSAI flathead sole (Monnahan and Haehn 2020): A statistical age-structured model as the primary assessment tool this stock was employed, which qualifies the stock as a Tier 3a stock. Final 2018 and 2019 catch biomasses and 2020 catch biomass through October 26, 2020 were added to the model. The 2018-2019 fishery age composition data were also

added, as well as the 2020 fishery length composition data were added to the model. The 2019 EBS shelf survey biomass was added to the linear regression used to determine estimates of AI survey biomass in years when no AI survey occurred; this updated survey biomass index was added to the assessment model for 1982-2019. The 1999 and 2018-2019 survey age composition data were added to the model as well as 2019 survey length composition data. Survey ages 1-2 were added to the model, and survey ages for Bering flounder were removed, both of which were mistakes in the previous assessment. No new model changes were considered this year. The previously accepted model 18.2c was updated with new data and is referred to as 18.2c (2020). 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 2019 update assessment (McGilliard et al. 2019) in the table below:

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2020	2021	2021*	2022*
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	684,768	692,915	602,497	608,576
Projected Female spawning biomass (t)	154,195	160,864	150,433	154,906
$B_{100\%}$	212,060	212,060	203,658	203,658
$B_{40\%}$	84,824	84,824	81,463	81,463
$B_{35\%}$	74,221	74,221	71,280	71,280
F_{OFL}	0.47	0.47	0.46	0.46
$maxF_{ABC}$	0.38	0.38	0.37	0.37
F_{ABC}	0.38	0.38	0.37	0.37
OFL (t)	82,810	86,432	75,863	77,763
maxABC (t)	68,134	71,079	62,567	64,119
ABC (t)	68,134	71,079	62,567	64,119
Status	As determined *last* year for:		As determined *this* year for:	
	2018	2019	2019	2020
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 8,669 t used in place of maximum permissible ABC for 2020 and 11,519 t used in place of maximum permissible ABC for 2021 and 2022. The final catch for 2020 was estimated by taking the average tons caught between October 26 and December 31 over the previous 5 years (2015-2019) and adding this average amount to the catch-to-date as of October 26, 2020. The 2021 and 2022 catch was estimated as the average of the total catch in each of the last 5 years (2015-2019).

BSAI Greenland turbot (Bryan et al. 2020a): New data for the assessment included the 2019 NMFS shelf bottom trawl survey biomass estimates and size compositions and the AFSC longline survey biomass estimates for 2019 and 2020. Size-at-age data from the 2018 and 2019 NMFS shelf bottom trawl surveys were also available and were used in this assessment. Fishery catch estimates were also updated and include a preliminary estimate for 2020. Data on fishery size composition from 2019 and 2020 were also included. The base model has the same configuration as the 2016 (model 16.4 in Barbeaux et al. 2016) and 2018 (model 16.1b in Bryan et al. 2018) assessments, except for the specified units of AFSC longline index. The AFSC longline relative population numbers are used as an assessment input. In Stock Synthesis, the units (i.e., numbers, weight, F) of the index is explicitly specified. In previous assessments, the specified units for the AFSC longline relative population numbers were in units of biomass. This was corrected and had minimal impacts on the assessment model results. The model number used in the 2018 assessment was also in error. Reverting back to the 2016 model nomenclature the current model number is 16.4a (2020) to represent this minor change and the 2018 assessment is referred to as 16.4 (2018) throughout the report. A summary of the recommended ABCs and OFLs from this assessment relative the ABC and OFL specified last year is shown below:

Quantity	As estimated or *specified last* year for: 2020	2021	As estimated or *recommended this* year* for: 2021	2022
M (natural mortality rate)	0.112	0.112	0.112	0.112
Tier	3a	3a	3a	3a
Projected total (age 1+)	106,101	98,532	87,849	79,382
Female spawning biomass	57,094	53,617	51,914	47,197
Projected				
$B_{100\%}$	90,534	90,534	89,054	89,054
$B_{40\%}$	36,213	36,213	35,622	35,622
$B_{35\%}$	31,687	31,687	31,169	31,169
F_{OFL}	0.21	0.21	0.22	0.22
$maxF_{ABC}$	0.18	0.18	0.18	0.18
F_{ABC}	0.18	0.18	0.18	0.18
OFL (t)	11,319	10,006	8,568	7,181
maxABC (t)	9,625	8,510	7,326	6,139
ABC (t)	9,625	8,510	7,326	6,139
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
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 16.4a (2020) and preliminary catches of 3,321 t was used in place of maximum permissible ABC for 2020. The preliminary catch for 2020 was estimated as the product of the average proportion of the TAC captured over the previous 5 years (2015-2019) and the 2020 TAC. The 2021 catch was set equal to max ABC as has been done in the previous Greenland turbot assessments.*

BSAI Kamchatka flounder (Bryan et al. 2020b): An age-structured assessment is presented for Kamchatka flounder and is a full update of the 2018 stock assessment. Structural changes were not made to the model. Model differences were due to changes in the data inputs (see summary below). Based on model performance in both fit and the retrospective analysis model 16.0b is recommended for management purposes. Summary of changes in assessment input were:

1) Estimates of catch were updated for all years. As of October 26, 2020, catch exceeded the TAC. The 2020 catch was estimated using an expansion factor of 1.025 that was derived from the five-year average proportion of the catch caught as of October 26, 2020.

2) The 2019 and 2020 fishery length composition data were added to the assessment.

3) The 2019 EBS shelf bottom trawl survey biomass and length composition estimates were added to the assessment.

4) The 2016 age composition data from the EBS slope bottom trawl survey were added to the assessment model. The 2016 length data were used in the 2018 assessment; therefore, were not included in this year's model.

5) The 2016 and 2018 age composition data from the AI bottom trawl survey were added to the assessment model. The 2016 and 2018 length data were used in the 2018 assessment model and were not included in this year's model.

6) The length-weight and von Bertalanffy growth relationships were updated with age and length data from NFMS bottom trawl surveys. In turn, the sex-specific, age-length transition matrices were updated.

The assessment methodology remained unchanged. A summary of the recommended ABCs and OFLs from this assessment relative the ABC and OFL specified last year is shown below:

	Tier 3 assessment model			
	As estimated last year for		As estimated this year for	
Quantity	2020	2021	2021	2022
M (natural mortality rate)	0.11	0.11	0.11	0.11
Tier	3a	3a	3a	3a
Projected total (age 2+) biomass (t)	162,709	163,158	144,671	143,248
Projected female spawning biomass				
Projected	57,948	57,892	54,341	55,256
$B_{100\%}$	107,673	107,673	101,376	101,376
$B_{40\%}$	43,069	43,069	40,550	40,550
$B_{35\%}$	37,685	37,685	35,482	35,482
F_{OFL}	0.108	0.108	**0.108**	0.108
$maxF_{ABC}$	0.090	0.090	**0.090**	0.090
F_{ABC}	0.090	0.090	**0.090**	0.090
OFL (t)	11,495	11,472	10,630	10,843
maxABC (t)	9,708	9,688	8,982	9,163
ABC (t)	9,708	9,688	8,982	9,163
	As determined *last* year for:		As determined *this* year for:	
Status	2018	2019	2019	2020
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 16.0b. The 2020 and 2021 catch were set equal to the extrapolated end of 2020 catch (7,427 t).*

BSAI northern rock sole (McGilliard et al. 2020): The 2020 catch biomass through October 28, 2020 and 2018 catches were added to the model. In addition, the 2018 catch biomass was updated to reflect October-December 2018 catches. 2018-2019 fishery age composition data were added to the model as well as the 2018-2019 survey age composition data. The 2019 EBS shelf survey biomass was added to the model. No changes were made to the assessment model methodology. The key results of the assessment, based on the author's preferred model, are compared to the key results of the accepted 2019 update assessment (Wilderbuer et al. 2019) in the table below.

Quantity	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
	2020	2021	2021*	2022*
M (natural mortality rate)	0.15	0.15	0.15 (f) 0.17 (m)	0.15 (f) 0.17 (m)
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	1,154,000	1,729,000	923,197	1,359,440
Projected Female spawning biomass (t)	415,000	389,000	294,627	286,381
B_0	546,800	546,800	476,820	476,820
B_{MSY}	197,400	197,400	158,972	158,972
F_{OFL}	0.147	0.147	0.157	0.157
$maxF_{ABC}$	0.146	0.146	0.152	0.152
F_{ABC}	0.142	0.142	0.152	0.152
OFL (t)	168,000	251,800	145,180	213,783
maxABC (t)	163,700	245,400	140,306	206,605
ABC (t)	163,700	245,400	140,306	206,605
Status	As determined *last* year for:		As determined *this* year for:	
	2018	2019	2019	2020
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 25,800 t used in place of maximum permissible ABC for 2020 and 47,500 t used in place of maximum permissible ABC for 2021 and 2022. The final catch for 2020 was set equal to the 2019 final catch. The 2021 and 2022 catch was estimated as the average over the past decade of final catches.

BSAI yellowfin sole (Spies et al. 2020): Relative to last year's BSAI SAFE report, the following substantive changes have been made to the BSAI yellowfin sole assessment. Despite no new survey data, several models are presented in this document that incorporate new data since the last full assessment in 2019.

Changes in the data:

1. The 2019 fishery age composition was added.
2. The 2019 survey age composition was added.
3. The estimate of the total catch made through the end of 2019 was updated as reported by the NMFS Alaska Regional office. The catch through the end of 2020 was estimated based on available data. Catch of 139,283 t was assumed for the 2021 and 2022 projections.
4. Due to Covid-19, the 2020 NMFS EBS shelf bottom-trawl survey was not conducted. Therefore, there is no survey biomass estimate from 2020.
5. Fishery weight-at-age was calculated based on methodology in the document.

Changes in the assessment methods:

Four models are presented in this assessment. Models 18.1 and 18.2 are presented in full, and Model 18.2 is the preferred model. Models 18.3 and 18.4 are presented to promote discussion on the use of the vector-autoregressive spatio-temporal (VAST) biomass estimates and incorporation of the Northern Bering Sea survey.

1. Last year's accepted model is referred to as Model 18.1. This model has not changed and uses the same natural mortality (M) for males and females, M=0.12.
2. A second model is presented (Model 18.2) that uses a fixed value for female M (M=0.12) and allows male M to be estimated within the model. This model was reviewed by the BSAI Plan Team in September 2020. Model 18.2 is the authors' preferred model.
3. Model 18.3 is the same as Model 18.2 except it incorporates VAST biomass estimates and standard errors for the EBS survey region, 1982-2019.
4. Model 18.4 is the same as Model 18.2 except it incorporates VAST biomass estimates and standard errors for the EBS and Northern Bering Sea, 1982-2019.

The accepted 2019 Model 18.1 included the survey mean bottom temperature across stations <100 m as a covariate on survey catchability, as in previous years, but added survey start date as an additional covariate within the model, based on a recent study by Nichol et al. (2019). Model 18.2 retains these features. Model 18.2 retains female M fixed at 0.12 while allowing the model to estimate male M. In the most recent EBS bottom trawl survey performed in 2019, the yellowfin sole biomass in the EBS was estimated to be 6% higher than in 2018 at 2,006,510 t. SSB estimated by Model 18.2 remained high at 1.86 x B_{MSY}. Therefore, yellowfin sole continues to qualify for management under Tier 1a. The 1978-2014 age-1 recruitments and the corresponding SSB estimates were used to fit the stock recruitment curve and determine the Tier 1 harvest recommendations. This assessment updates last year's assessment with results and management quantities that are higher than the 2019 assessment. Model 18.2 estimated male M to be higher than female M=0.135, which increased biomass estimates. Catch as of October 13, 2020 was 128,092 t. Over the past 5 years (2015-2019), 93.6% of the catch has taken place by this date. Therefore, the full year's estimate of catch in 2020 was 136,821 t. This is lower than the average catch over the past ten years 139,271 t. Future catch for the next 10 years, 2021 - 2030 was estimated as the mean of the past 10 years catch. Yellowfin sole continue to be above B_{MSY} and the annual harvest remains below the ABC level. Management quantities are given in the following table for the 2019 accepted model (Model 18.1) and the 2020 preferred model (Model 18.2). The projected estimate of total biomass for 2021 was higher by 11% from the 2019 assessment of 2,486,700 t, to 2,755,870 t. The model projection of SSB for 2021, assuming catch for 2020 as described above, was 1,040,900 t, 23% higher than the projected 2020 SSB from the 2019 assessment of 847,101 t. The 2021 and 2022 ABCs using F_{ABC} from this assessment model were higher than the 2019 ABC of 278,370 t, 313,477 t, and 344,140 t. The 2021 and 2022 OFLs estimated by model 18.2 were 341,571 t and 374,982 t. A summary of the recommended ABCs and OFLs from this assessment relative the ABC and OFL specified last year is shown below:

Quantity	As estimated or *specified* *last* year for: 2020	2021	As estimated or *recommended* *this* year for: 2021	2022
M (natural mortality rate)	0.12	0.12	0.12, 0.135	0.12, 0.135
Tier	1a	1a	1a	1a
Projected total (age 6+) biomass (t)	2,486,700 t	2,733,340 t	2,755,870 t	3,025,430 t
Projected female spawning biomass (t)	847,101 t	809,813 t	1,040,900 t	996,044 t
$B_{100\%}$	1,275,940 t	1,275,940 t	1,528,700 t	1,528,700 t
$B_{MSY\%}$	477,288 t	477,288 t	559,704 t	559,704 t
F_{OFL}	0.123	0.123	0.124	0.124
$maxF_{ABC}$	0.112	0.112	0.114	0.114
F_{ABC}	0.112	0.112	0.114	0.114
OFL	306,410 t	336,801 t	341,571 t	374,982 t
$maxABC$	278,370 t	305,980 t	313,477 t	344,140 t
ABC	278,370 t	305,980 t	313,477 t	344,140 t
Status	2018	2019	2019	2020
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Projections were based on estimated catches of 136,821 t in 2020 and 139,271 t used in place of maximum ABC for 2021.

GOA arrowtooth flounder (Shotwell et al. 2020b): The scheduled frequency for some stock assessments was recently changed in response to the National Stock Assessment Prioritization effort (Hollowed et al. 2016). In previous years, all GOA rockfish stocks were assessed on a biennial stock assessment schedule to coincide with the availability of new survey data. There was no change in this schedule for the arrowtooth flounder stock. For this off-cycle (even) year, we present a partial assessment consisting of an executive summary with recent fishery catch and survey trends as well as recommend harvest levels for the next two years. In on-cycle (odd) years, a full stock assessment document with updated assessment and projection model results will be presented to recommend harvest levels for the next two years. The 2019 full SAFE report for further information regarding the stock assessment (Spies et al. 2019). A statistical age-structured model as the primary assessment tool for the GOA arrowtooth flounder stock was used, which qualifies as a Tier 3 stock. This assessment consists of a population model, which 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 size compositions, bottom trawl survey abundance estimates, bottom trawl survey age compositions, and bottom trawl survey size compositions when age compositions are not available. For an off-cycle year, we do not re-run the assessment model, but do update the projection model with new catch information. This incorporates the most current catch information without re-estimating model parameters and biological reference points. As with last year, we use the full assessment base model from 2017 (Model 17.b). There were no changes made to the assessment model inputs since this was an off-cycle year. New data added to the projection model included an updated 2019 catch estimate of 24,584 t and new catch estimates for 2020-2022. We estimated the 2020 catch by increasing the official catch as of October 21, 2020, by an expansion factor of 1.11, which represents the average fraction of catch taken after October 21 in the last five complete years (2015-2019). This resulted in an estimated catch for 2020 of 23,224 t. There were no changes to the assessment methodology since this was an off-cycle year. Based on the projection model results, recommended ABCs for 2021 and 2022 are 126,970 t and 123,445 t, respectively, and the OFLs are 151,723 t and 147,515 t. The new ABC and OFL recommendations for 2021 are similar to the 2020 ABCs and OFL developed using the 2017 full assessment model. The stock is not overfished and is not approaching a condition of being overfished. Reference values are presented in the following table.

Quantity	As estimated or *specified last* year for: 2020	2021	*As estimated or *recommended this* year for: 2021	2022
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)	1,325,867	1,321,075	1,321,700	1,318,860
Projected Female spawning	756,100	718,325	752,703	724,288
$B_{100\%}$	1,028,329	1,028,329	1,028,330	1,028,330
$B_{40\%}$	411,332	411,332	411,331	411,331
$B_{35\%}$	359,915	359,915	359,915	359,915
F_{OFL}	0.234	0.234	0.234	0.234
$maxF_{ABC}$	0.193	0.193	0.192	0.192
F_{ABC}	0.193	0.193	0.192	0.192
OFL (t)	153,017	127,773	151,723	147,515
maxABC (t)	128,060	124,357	126,970	123,445
ABC (t)	128,060	124,357	126,970	123,445
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
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 23,224 t for 2020 and 18,662 t for 2021.
**Natural mortality rate is 0.35 for males, 0.2 for males.

GOA flathead sole (Monnahan 2020): The GOA flathead sole stock is assessed every four years and was last assessed in 2017. In years without a full assessment, an executive summary to recommend harvest levels for the next two years is presented. A full stock assessment document with updated assessment and projection model results will be presented in 2021. 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 2017-2019 and estimated catch for 2020 and 2021, to predict stock status for flathead sole in 2021 and 2022 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 OFLs and ABCs. Changes in input data: The updated information for this partial assessment includes replacing the estimated 2019 catch with the final catch value and estimating the 2020-2022 catch estimates. The 2020 projected catch was calculated as the current catch as of October 22, 2020 added to the average October 2-December 31 catches over the five previous years. The 2021 and 2022 projected catches were calculated as the average catch over the previous 5 years. There were no changes in assessment methodology for this partial assessment. The recommended ABC for flathead sole is 39,377 t for 2021 and 39,851 t for 2022 and the OFL is 47,982 t in 2021 and 48,534 t in 2022. The new ABC recommendation and OFL for 2021 and 2022 are similar to those projected for 2020 and 2021 (38,196 t and 46,572 t). The principal reference values are shown in the following table:

Quantity	As estimated or *specified last* year for: 2020	2021	As estimated or *recommended this* year for: 2021*	2022*
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	282,371	280,730	280,980	278,418
Projected Female spawning biomass (t)	92,467	95,216	95,338	96,833
$B_{100\%}$	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)	46,572	47,919	47,982	48,534
maxABC (t)	38,196	39,326	39,377	39,851
ABC (t)	38,196	39,326	39,377	39,851
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
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 1,965 t used in place of maximum permissible ABC for 2020 and 2,269 t used in place of maximum permissible ABC for 2021 and 2022. The 2020 projected catch was calculated as the current catch as of October 22, 2020 added to the average October 22 – December 31 catches over the 5 previous years. The 2021 and 2022 projected catch was calculated as the average catch over the previous 5 years.

GOA northern and southern rock sole (Bryan and Palsson 2020): The GOA northern and southern rock sole assessment is conducted on a four-year assessment cycle following the stock assessment prioritization schedule. During years when a full assessment is not completed, a partial assessment is conducted. A partial assessment is provided this year. The last full assessment was completed in 2017 and marked the first year of the new assessment schedule. Refer to Bryan (2017) for the most recent full assessment.

A statistical catch-at-age model configured in Stock Synthesis 3 is used as the primary assessment tool for GOA northern and southern rock sole, which qualify as Tier 3 stocks. The model is run separately for each species. The data used in the assessment model includes fishery catch, the GOA trawl survey biomass, fishery and survey size composition, and survey conditional age-at-length. The full assessment model was not run this year. The projection model was updated with new catch data and run to provide updated management advice.

Changes in the input data: New input data added to the projection model included a final 2019 catch estimate and a preliminary projected total catch estimate for 2020. Northern and southern rock sole are not differentiated in the commercial catch data. Total rock sole catches are assumed to be comprised of 50% northern rock sole and 50% southern rock sole. The 2019 catch used in the projection model was increased to 1,086 t from 880 t. The 2020 catch input, 1531.48 t, was estimated by expanding half of the October 30 total rock sole catch by a factor of 1.082. This expansion factor was estimated as the five-year (2015-2019) average proportion of catch as of October 26 through the end of the fishing year. No changes were made to the assessment model. The recommended 2021 maximum ABC for northern rock sole is 17,756 t, and for southern rock sole is 22,990 t from the updated projection model. For northern rock sole, this represents a less than 1% increase from the 2020 ABC and a less than 1% decrease in the 2021 ABC from last year's projection model. The southern rock sole 2021 ABC represents a 3% increase from the 2020 ABC and a less than 1% increase in the 2021 ABC from last year's projection model. Overfishing is not occurring, the stock is not overfished, and it is not approaching an overfished condition. Status is determined by comparing the most recent complete year (2019) of official catch to the OFL and comparing the projected SSB relative to B35%. The official rock sole, total catch for 2019 (2,172 t) is less than the combined 2019 OFL (47,453 t) indicating overfishing is not occurring. SSB is projected to be above B35% for 2020-2022; hence, the stock is not overfished, and it is not approaching an overfished condition. Survey biomass has been declining since 2009. Compared to 2017, the 2019 biomass estimates declined by 28% and 7% for northern rock sole and southern rock sole, respectively. Catch-biomass ratios were derived from the reported catch obtained from the NMPF's Alaska Regional Office Catch Accounting System and total biomass estimates from the assessment model for 1993 through 2019. The 2020 ratio was derived from the preliminary 2020 catch estimate and the total biomass from the projection model. The northern rock sole catch-biomass ratio ranged from less than 0.01 to 0.04 and southern rock sole exploitation rate ranged between 0.005 and 0.02 from 1993 to 2008. Both have been generally declining since 2008. The tables on following pages summarize the biological reference points and the recommended ABC and OFL values for northern rock sole and southern rock sole (shown in bold).

Northern Rock Sole

Quantity	As estimated or *recommended last* year for: 2020	2021	As estimated or *recommended this* year for: 2021	2022
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)	94,619	95,275	94,612	94,614
Projected Female spawning biomass (t)	47,701	46,643	47,694	46,330
$B_{100\%}$	51,387	51,387	51,387	51,387
$B_{40\%}$	20,555	20,555	20,555	20,555
$B_{35\%}$	17,985	17,985	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)	20,962	21,246	**21,080**	21,191
maxABC (t)	17,655	17,897	**17,756**	17,851
ABC (t)	17,655	17,897	**17,756**	17,851
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
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.

Southern Rock Sole

Quantity	As estimated or *specified last* year for: 2020	2021	As estimated or *recommended this* year for: 2021	2022
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)	142,193	145,405	144,833	148,917
Projected Female spawning biomass (t)	71,643	71,340	72,973	73,930
$B_{100\%}$	93,518	93,518	93,518	93,518
$B_{40\%}$	37,407	37,407	37,407	37,407
$B_{35\%}$	32,731	32,731	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)	**26,491**	27,326	**27,204**	27,943
maxABC (t)	**22,390**	23,094	**22,990**	23,614
ABC (t)	**22,390**	23,094	**22,990**	23,614
Status	As determined *last* year for: 2018	2019	As determined *this* year for: 2019	2020
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.

GOA rex sole (McGilliard and Palsson 2019): The GOA rex sole stock is assessed every four years and was last assessed in 2017. In between the full assessment years, an executive summary to recommend harvest levels for the next two years is presented. Refer to the full stock assessment report for the assessment model (McGilliard and Palsson 2017). A full stock assessment document with updated assessment and projection model results will be presented in 2021. 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 OFLs and ABCs. Based on the updated projection model results, the recommended ABCs for 2019 and 2020 in the Western-Central GOA are 11,308 t and 11,327 t, and the OFLs 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 ABCs for 2019 and 2020 in the Eastern GOA are 3,384 t and 3,398 t, and the OFLs 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 the following three tables. 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.

Quantity	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2019	2020	2020*	2021*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	98,818	99,383	100,198	101,244
Female spawning biomass (t)	44,072	43,392	43,855	44,500
$B_{100\%}$				
$B_{40\%}$				
$B_{35\%}$	See area-specific tables below		See area-specific tables below	
F_{OFL}				
$maxF_{ABC}$				
F_{ABC}				
OFL (t)	17,889	17,942	18,127	18,779
maxABC (t)	14,692	14,725	14,878	15,416
ABC (t)	14,692	14,725	14,878	15,416
Status	As determined *last* year for:		As determined *this* year for:	
	2017	2018	2018	2019
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

Quantity: (Western-Central GOA)	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2019	2020	2020*	2021*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	77,483	77,939	78,755	79,666
Female spawning biomass (t)	35,066	34,484	34,948	35,506
$B_{100\%}$	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)	13,755	13,788	13,974	14,512
maxABC (t)	11,308	11,327	11,480	11,925
ABC (t)	11,308	11,327	11,480	11,925
Status	As determined *last* year for:		As determined *this* year for:	
	2017	2018	2018	2019
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 2017-2018 from the Western and Central GOA of 1,483 t and 1,749 t and estimated catches of 1,574 t and 2,103 t that were used in place of maximum permissible ABC for 2019 and 2020-2021, respectively. The 2019 projected catch was calculated as the current catch of GOA rex sole in the Western and Central GOA as of October 19, 2019 added to the average October 19 – December 31 GOA rex sole catches over the 5 previous years. The 2020-2021 projected catch was calculated as the average catch over the previous five years.

Quantity: (Eastern GOA)	As estimated or *specified this* year for:		As estimated or *recommended this* year for:	
	2019	2020	2020*	2021*
M (natural mortality rate)	0.17	0.17	0.17	0.17
Tier	3a	3a	3a	3a
Projected total (3+) biomass (t)	21,335	21444	21,443	21,578
Female spawning biomass (t)	9,006	8,908	8,907	8,994
$B_{100\%}$	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)	4,134	4,154	4,153	4,267
maxABC (t)	3,384	3,398	3,398	3,491
ABC (t)	3,384	3,398	3,398	3,491
Status	As determined *last* year for:		As determined *this* year for:	
	2017	2018	2018	2019
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 2017-2018 from the Eastern GOA and estimated catches of 2.3 t and 1.5 t that were used in place of maximum permissible ABC for 2019 and 2020-2021, respectively. The 2019 projected catch was calculated as the current catch of GOA rex sole in the Eastern GOA as of October 19, 2019. The 2020-2021 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.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses.

6.1 States shall establish safe target reference point(s) for management.

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.

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.

6.4 Management actions shall be agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 7.

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

No. Supporting clauses	5
Supporting clauses applicable	4
Supporting clauses not applicable	1 (7.2)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The status of U.S. fish stocks is determined by two metrics. The first is the relationship between the actual exploitation level and the OFL. If the exploitation level (or F) exceeds the F_{OFL}, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the 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 two years. Harvest specifications for each of the target stocks are made annually by the Council and include the OFL, ABC, and TAC. Links to these documents from the December 2020 Council meeting, with harvest specifications adopted for 2021 and 2022, are as follows: https://www.npfmc.org/goa-specs-2/ and https://www.npfmc.org/bsai-specs-2/.

The Council's 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 F 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). Alaska flatfish complex stocks are mostly classified in Tier 3. The BSAI and GOA groundfish FMPs have pre-defined HCRs 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.

The PA reference points are established by the Council's PA 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 numerous references and examples of how uncertainty is dealt with in the stock assessment in the annual SAFE reports. Also, the 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. The SAFE reports and FMPs have been referenced in previous sections.

The FMPs also have another reference point, B20%, defined 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 SSB of such a species is projected in the stock assessment to fall below B20% in the coming year. However, this does not change the specification of ABC or OFL."

Stock assessments are comprehensive and reviewed on a number of levels, including externally by CIE. Where data gaps have been identified, and these are outlined in the SAFE reports, the NMFS/AFSC has ongoing research programs capable of addressing these needs. Organizations such as NPRB enable scientists from a number of disciplines and agencies to work collaboratively on a variety of fishery related studies in Alaska waters. There are pre-agreed Council HCRs in place to ensure overfishing does not occur on the Alaska flatfish stocks and to reduce F if reference points are approached or exceeded, as outlined in the tiered PA system described previously. 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. 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."

Clause 7.2 is not applicable, as fisheries for Alaska flatfish complex fisheries are well established and are not exploratory fisheries. There are no concerns with the use of introduced or translocated species.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clause 7.2 is not applicable.

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.

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.

7.1.2 In the absence of adequate scientific information, appropriate research shall be initiated in a timely fashion.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

6.4 Management Measures (D)

Fundamental Clause 8.

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

No. Supporting clauses	17
Supporting clauses applicable	15
Supporting clauses not applicable	2 (8.11, 8.14)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The MSA requires that conservation and fisheries management measures prevent overfishing while achieving OY on a continuing basis and sets out the standards (e.g., optimal use and avoiding overfishing) which are followed in managing the Alaska flatfish complex fisheries. The Council uses a multi-tier PA, which includes OY and MSY reference points. NMFS and the Council follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal target stocks fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations. These systems are

described extensively in Fundamental Clauses 6 and 7 above. The objectives are spelled out clearly in FMPs for BSAI and GOA regions, and both FMPs contain long-term management objectives for the Alaska flatfish complex fisheries. The Alaska flatfish complex fisheries are managed by ADFG and BOF. Extensive cooperation exists between federal and state authorities in assessing and managing the Alaska flatfish complex stocks. OY is given (in the FMPs) 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. The range for BSAI is 1.4 to 2.0 million tons while the range for GOA is 116 to 800 thousand tons. To prevent overfishing, the Council's management objectives include the following measures specific to OY:

1) Adopt conservative harvest levels for multi-species and single species fisheries and specify OY
2) Continue to use the 2 million mt OY cap for the BSAI groundfish fisheries
3) Provide for adaptive management by continuing to specify OY as a range

AFSC runs the Economic and Social Sciences Research Program in Alaska. The aim of the Program is to provide economic and sociocultural information to assist NMFS in meeting its stewardship responsibilities with activities being conducted in support of this mission. The Council has established the Social Science Planning Team to improve the quality and application of social science data that informs management decision-making and program evaluation. The 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 Alaska fisheries (Fissel et al. 2020) and a section on economics in the SAFE reports. 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 2020-2021 harvest levels are specified by the Council (see links given in Fundamental Clause 7 above).

As listed in the FMPs and in NMFS regulations, the only legal gears for taking Alaska flatfish complex fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. Regulations pertaining to vessel and gear markings in the fishery are established in NMFS and ADFG regulations as prescribed in the annual management measures published in the Federal Register. There was no evidence that indicated the marking of gear is not being followed or is not effective. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such methods are being used illegally. There is no evidence that regulations involving gear selectivity in Alaska flatfish complex fisheries are being circumvented either by omission, or through the illegal use of gear technology. Evidence provided by fishing fleets indicates that lost fishing gear is minimal. A NOAA (2015a) study shows ghost fishing and gear loss for derelict trawl (and other gears such as longline) are likely to be lower in comparison to gillnets and trap gears, although less in known of the effects of derelict trawls and longlines. According with the information provided by the client, gear loss is rare and lost gear is usually recovered, but this information is not generally collected by the client.

The Council and BOF have extensive processes in place to allow for identifying and consulting with domestic parties having interest in the Alaska flatfish complex fisheries. The Council is responsible for allocation of the target stocks resource among user groups in Alaska waters, and the 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 target stocks off Alaska to participate in the development of legal regulations for fisheries. Organizations and individuals involved in the fishery and management process have been identified. The Alaska management process has many stakeholders, including license holders, processors, fishermen's organizations, cooperatives, coalitions, the states of Alaska, Washington, and Oregon, CDQ groups, and environmental groups. The Council's 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 Alaska flatfish complex fisheries. The Council 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 Western Alaska CDQ Program, established by the Council in 1992, allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities. There are approximately 65 communities within a 50-mile radius of the BS coastline who participate in the program.

Mechanisms have been established to reduce capacity to levels commensurate with sustainable use of the fishery resources in Alaska. These include HCRs for catch and effort management, an overall OY cap in GOA and BSAI regions, a license limitation and restricted access 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, aimed at reduction of bycatch and further rationalization of the fishery. Fleet capacity and regularly updated data on all 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.

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 FMPs for GOA and BSAI. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaska waters also exists, and data on seabirds are collected by observers, and included in the SAFE documents. Various measures to reduce bycatches of PSC species (e.g., crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted in recent years. 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 MRA of skates using groundfish and halibut as basis species in the GOA from 20% to 5%, as a necessary measure to limit the incidental catch and discards of skates in GOA groundfish and halibut fisheries.

The FMPs for BSAI and GOA groundfish state that “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 SSB of such a species is projected in the stock assessment to fall below B20% in the coming year” (NPFMC 2020a, b). The Council has acted in a precautionary manner to place protections around Steller sea lion rookeries and haulouts and close areas where fishing may impact Steller sea lion prey. ADFG has also implemented areas closed to fishing in PWS around Steller sea lion rookeries. ADFG notes that co-management agreements have been established between the NMFS and the Aleut Marine Mammal Commission, the Traditional Council of St. George Island, and the Traditional Council of St. Paul Island.

None of the Alaska flatfish complex fisheries stocks are classified as overfished or undergoing overfishing, and no destructive fishing practices are allowed in GOA or BSAI that would adversely impact habitat. With regard to other resources taken in the 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. Extensive 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). Exempted fishing permits have been issued for deck sorting on Amendment 80 catcher/processors (C/Ps) to reduce halibut mortality. Numerous measures to protect Steller sea lion populations and habitat impacts are implemented in the FMPs for GOA and BSAI groundfish. NMFS and the Council 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. Further details on this are described under Fundamental Clause 12 below.

Amendment 97 established annual Chinook salmon PSC limits for the groundfish trawl fisheries, except for pollock trawl fisheries, in the Western and Central GOA. This action established annual Chinook salmon PSC limits for various fleet sectors and also established incentives for reducing Chinook salmon PSC for the trawl C/P and non-rockfish program catcher vessel sectors and established seasonal Chinook salmon PSC limits for the trawl C/P sector. The majority of chinook bycatch in GOA is from the pollock fishery, and a recent supplementary Biological Opinion concluded that groundfish fisheries in the GOA were not likely to jeopardize the continued existence of threatened Chinook stocks. Amendment 103 to the GOA FMP, passed in September 2016, allows NMFS to reapportion unused Chinook salmon PSC within and among specific trawl sectors in the Central and Western GOA, based on specific criteria and within specified limits. This rule does not increase the current combined annual PSC limit of Chinook salmon that applies to Central and Western GOA trawl sectors and promotes more flexible management of GOA trawl Chinook salmon PSC.

In Alaska flatfish complex fisheries, gear loss is rare and lost gear is usually recovered. However, this information is not generally collected by the client. The fishery for Alaska flatfish complex is carried out by U.S. vessels only. In adjacent waters of the GOA cooperation on research and management between Canada and the United States occurs as part of the science and management process. One such avenue for cooperation is the TSC of the Canada-U.S. Groundfish Committee, formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in U.S. 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, including surveys, age reading, and gear research.

There are numerous measures implemented in Alaska fisheries to minimize non-utilized catches, such use prohibition of discarding (Improved Retention/Improved Utilization 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. Key studies include research on excluder devices, deck sorting of halibut, and research on pots to reduce Tanner crab bycatch. Additional information on bycatch is presented in Fundamental Clause 12 below.

Evidence of continuous compliance with the supporting clauses
There is no material change in compliance with any of the following supporting clauses. Clauses 8.11 and 8.14 are not applicable.

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.

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.

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

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.

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

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.

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.

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

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.

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.

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.

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.

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.

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.

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 9.

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

No. Supporting clauses	3
Supporting clauses applicable	3
Supporting clauses not applicable	0
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The Fishing Vessel Owners Association provides a large and diverse training program that many of the professional crew members must pass, and the Sitka-based Alaska Marine Safety Education Association has trained more than 10,000 fishermen in marine safety and survival. Captains and some officers on certain larger vessels in Alaska require particular levels of navigational certification. Alaska's Department of Labor and Workforce Development includes Alaska's Institute of Technology (formerly called Alaska Vocational Training and Education Center). One of the Institute'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 Alaska maritime industry. Also, the University of Alaska Sea Grant Marine Advisory Program provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. Additional education is provided by the Fishery Industrial Technology Center, in Kodiak, Alaska.

All rules and regulations governing Alaska fisheries, including those dealing with responsible fishing methods, are readily available on NMFS, the Council, and ADFG websites. A summary of the Council 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, individual fishing quotas, etc. To increase communications and understanding between the

regulated users and enforcement personnel, NOAA OLE strives to maintain a positive and productive relationship with all harvesters and industry personnel, by providing current regulatory information and guidance to promote compliance and responsible fisheries.

Data on the number and location of Alaska fishers, permits issued, etc. can be found in the annual SAFE documentation. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network. Data on fishing in Alaska state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission (CFEC) 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. USCG also maintains records and issues credentials on licenses for crewmembers, including engineers, captains, mates, deckhands, etc. The State of Alaska issues commercial fishing licenses for all crew.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses.

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

6.5 Implementation, Monitoring and Control (E)

Fundamental Clause 10.

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

No. Supporting clauses	6
Supporting clauses applicable	2
Supporting clauses not applicable	4 (10.3, 10.3.1, 10.4, 10.4.1)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The USCG, NMFS OLE, and AWT conduct at-sea and shore-based inspections. At-sea, dockside monitoring, aerial surveillance, and satellite vessel monitoring systems are in operation within the fisheries and developmental of electronic monitoring is ongoing. Monitoring, control, and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE and the USCG. 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. The Observer Program is the main data gathering program for all biological and fishery data for target stock assessment and management. An annual report is produced on the Alaska observer program, which covers fisheries in the BSAI and GOA regions. Although observers are not directly part of the federal MCS program, they are

required to report infringements, and OLE and USCG officers conduct de-briefing interviews with observers to check on vessels' fishing practices and the conduct of the crew.

The 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. OLE, USCG, and AWT staff have on-line access to information related to permits and licenses and are therefore able to confirm whether a vessel or individual has the correct credentials to be operating in a fishery.

The OLE publishes a national annual report and the Alaska region submits six monthly reports to the Council. The USCG publishes an annual report to the Council 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 December 2020 report (https://www.uscg.mil/Portals/0/documents/budget/FY_2020_USCG_APR_Final-V3-dtd-3-16-2021.pdf?ver=2021-03-15-113137-970) did not note any specific issues with regard to the present fisheries. The low occurrence of serious offences indicates that the fishery is generally very compliant with regulations and the sanctions are considered to be an effective deterrent.

There have been extensions to observer deployment contracts due to Covid-19, but this has not changed the level of monitoring.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clauses 10.3, 10.3.1, 10.4, and 10.4.1 are not applicable.

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.

10.2 Fishing vessels shall not be allowed to operate on the resource in question without specific authorization.

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.

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.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 11.

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

No. supporting clauses	3
Applicable supporting clauses	2
Non-applicable supporting clauses	1 (11.3)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

The MSA provides four options for penalizing violations, listed in ascending order of severity:

1. Issuance of a citation (a type of warning), usually at the scene of the offence
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

The policy of NMFS is to enforce the provisions of the MSA by utilizing the authorized remedies best suited in a particular case. 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 can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings. The low proportion of violations encountered during at-sea patrols of the Alaska fisheries demonstrates effective deterrence. No recent sanctions have been applied by State of Alaska authorities in the state target stocks fisheries and ADFG staff consider that sanctions are effective deterrents.

NOAA Alaska region has available a "Summary Settlement and Fix-it Schedule", which describes the violation and penalties associated with them. It also includes an increasing scale of penalty for repeat offences. Alaska state law describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than one year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. The option of pursuing criminal action is also available to the state.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. Clause 11.3 is not applicable.

11.1 National laws of adequate severity shall be in place that provide for effective sanctions.

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.

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.

Changes to Fundamental Clause Confidence Ratings.

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

6.6 Serious Impacts of the Fishery on the Ecosystem (F)

Fundamental Clause 12.

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

No. supporting clauses	16
Applicable supporting clauses	16
Non-applicable supporting clauses	0
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental and supporting clause:

There are no material changes (since the last assessment activity) in compliance with the supporting clauses, evidence of compliance is therefore provided in a summarized format.

GOA

Assessment of environmental and social effects and management consideration (Supporting clauses: 12.1, 12.2, 12.3, 12.4, 12.10)

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.

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

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.

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.

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.

Programs of monitoring, evaluation, and management response continue at the level when the fishery was re-certified, supported by wide-ranging evaluations such as the Final Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (NOAA 2004; updated via NOAA 2015b). This is reflected in the updated flatfish SAFE reports (including evaluation of ecosystem considerations) and the specific GOA Ecosystem Status Report (McGilliard and Palsson 2019; Byran and Palsson 2020; Monnahan 2020; Shotwell et al. 2020b; Ferriss and Zador 2020). Also carried out was an updated evaluation of the economic status of the groundfish fisheries off Alaska (Fissel et al. 2020). Included in the environmental analyses are considerations of the effects of ecosystem variation (notably the warming of 2014-2016) on production.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding non-target catches (Supporting clauses 12.5, 12.6, 12.11)

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

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.

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).

Monitoring is carried out through the Observer Program operated by the NMFS. In 2020, the Program was dramatically scaled back due to Covid-19 and related precautions. Industry worked closely with the Program to maintain data collection. The catch of retained species in 2019 and 2020 were similar to the three previous years, with non-target catch making up less than 3% of the total catch. Although the catch of non-FMP species generally increased in 2019, there was a decline 2020. In most cases, the bycatch of prohibited species decreased from 2019 to 2020, with the only increase occurring with bairdi crab. The NOAA catch data provided by the client show an almost 200% increase from 2019 to 2020 in bairdi crab catch. These data may be calculation errors but will be reviewed during the 2021 surveillance audit.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding endangered species and dependent predators (Supporting clauses 12.5, 12.5.1, 12.12, 12.14)

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

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.

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.

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.

Mammals
According to NOAA’s List of Fisheries, the GOA flatfish trawl fishery is classified as Category III (remote likelihood or no known interaction). The latest Alaska marine mammal stock assessment report updated the stock status and provided new estimates of potential biological removals (PBRs) for several species (Muto et al. 2020). It also summarized the incidental mortality and injury due to commercial fisheries using the latest available data. The relevant species listed on the ESA list are the Steller sea lion (western U.S. stock). According to observer data, in recent years (2013-2017), the fishery has caused only one Steller sea lion mortalities (Delean et al. 2020). Steller sea lions, there has been a sustained increase in population size in all areas of the GOA since 2003.

Seabirds
Interactions with fishing gear are recorded through the NMFS Observer Program (summarized in Krieger and Eich 2020), and population trends are monitored by the USFWS (summarized in Dragoo et al. 2019). Data show no significant changes to the amount of bycatch. Work to improve mitigation measures continues, and a workshop was convened in November 2017 that discussed voluntary mitigation efforts to reduce seabird cable strikes on trawl vessels, primarily in West Coast fisheries but also Alaska trawl fisheries. Short-tailed albatross remain the main endangered bird species of concern in the Alaska fisheries, and this fishery has not caught any (or any other seabird species) in recent years.

Salmon
The bycatch of ESA-listed Chinook salmon by the GOA flatfish fishery increased in 2018 and 2019 but decreased again in 2020, and the amounts have been within the fishery’s limit of 25,000 Chinook salmon. Data continue to be collected, and the bycatch numbers are analyzed annually (NFMS 2019a, b). However, likely due to Covid-19, the data were not analyzed in 2020. Any updated information will be reviewed during the 2021 surveillance audit.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding aquatic ecosystems (Supporting clauses 12.7, 12.8, 12.15)

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.

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).

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.

The GOA Ecosystem Status Report includes continuing monitoring of a range of ecosystem indicators, all considered by the Council in the decision-making process (Ferriss and Zador 2020). Covid-19 has impacted many surveys and data collections in 2020. The team concludes that the risk is low though since the fishery has had a high level of monitoring in the past. It is expected that more information will be available at the 2021 surveillance audit.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding essential habitats (Supporting clauses 12.9, 12.13)

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.

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.

The most recent five-year review of EFH took place in 2016 using a new Fishing Effects model to assess the impacts of fishing activities on EFH (Simpson et al. 2017). Overall, fishing impacts in the flatfish core EFH area are very low. The average percentage impact for the entire GOA for 2003-2016 was 1.3%, which is well below the 10% habitat impact that was established as the trigger for further analysis (https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/). The final environmental assessment (for EFH Omnibus Amendments was published in June 2018. Amendment 105 is the relevant omnibus amendment to the FMP for the groundfish fishery of the GOA (NMFS 2018). Based on the most recent five-year review of EFH, the Council determined that new habitat and life history information is available to revise many of the EFH descriptions and maps. These amendments (105 for the GOA) to the EFH provisions in the Council's FMPs would not substantively change the impacts of EFH as analyzed in the 2005 EFH EIS. The 2015 EFH five-year review concluded that no change to the conclusions of the evaluation of fishing effects on EFH is warranted based on new information. None of the FMP amendments require regulatory action. The next EFH review is scheduled for 2022.

No changes that would affect the existing confidence ratings are evident.

BSAI

Assessment of environmental and social effects and management consideration (Supporting clauses: 12.1, 12.2, 12.3, 12.4, 12.10).

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.

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

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.

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.

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.

Programs of monitoring, evaluation and management response continue at the level when the fishery was re-certified, supported by wide-ranging evaluations such as the Programmatic Supplemental Environmental Impact Statement (NOAA 2004; updated via NOAA 2015b). This is reflected in the updated flatfish SAFE reports (including evaluation of ecosystem considerations) and the Ecosystem Status Reports (Bryan et al. 2020a, b; McGilliard et al. 2020; Monnahan and Haehn 2020; Ormseth et al. 2020; Ortiz and Zador 2020; Shotwell et al. 2020a; Siddon 2020; Spies et al. 2020). Also carried out was an updated evaluation of the economic status of the groundfish fisheries off Alaska (Fissel et al. 2020). Included in the environmental analyses are considerations of the effects of ecosystem variation (notably the warming of 2014-2016) on production.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding non-target catches (Supporting clauses 12.5, 12.6, 12.11)

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

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.

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).

Monitoring is carried out through the Observer Program operated by the NMFS. In 2020, the Program was dramatically scaled back due to Covid-19 and related precautions. Industry worked closely with the Program to maintain data collection. The catch of retained species in 2019 and 2020 were similar to the three previous years, with non-target catch making up less than 3% of the total catch. Although the catch of non-FMP species generally increased in 2019, there was a decline 2020. In most cases, the bycatch of prohibited species increased in 2018 and 2019 and most decreased again in 2020, with the only increase occurring with bairdi crab. However, the catch remains within the PSC limit.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding endangered species and dependent predators (Supporting clauses 12.5, 12.5.1, 12.12, 12.14)

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

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.

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.

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.

Mammals
According to NOAA's List of Fisheries, the BSAI flatfish trawl fishery is classified as Category II (occasional interactions). The latest Alaska marine mammal stock assessment report updated the stock status and provided new estimates of PBRs for several species (Muto et al. 2020). It also summarized the incidental mortality and injury due to commercial fisheries using the latest available data. The four relevant species listed on the ESA list are:

- Bearded seal (Beringia distinct population segment [DPS])
- Humpback whale (western North Pacific DPS)
- Ringed seal (Arctic subspecies)
- Steller sea lion (western U.S. stock)

According to observer data, in recent years (2013-2017), the trawl fishery averaged 1 bearded seal, 0 humpback whale, 2.4 ringed seal, and 7.8 Steller sea lion mortalities (Delean et al. 2020). Overall, these species' populations appear to be stable or increasing. There are no population or trend estimates for the bearded and ringed seal stocks. There is no PBR defined for the bearded seal, but the ringed seal has a BS PBR of 4,755. The population and trend estimates for the humpback whale do not cover the entire stock. The PBR for the humpback whale is 3. Regarding the Steller sea lion, there has been a sustained increase in the population size in the BS with some decreasing in the AI. Overall, the fishery's impact on these species is minimal.

Seabirds
Interactions with fishing gear are recorded through the NMFS Observer Program (summarized in Krieger and Eich 2020), and population trends are monitored by the USFWS (summarized in Dragoo et al. 2019). Relatively few seabirds are taken in the BSAI flatfish fishery, with declines in 2018-2020. Short-tailed albatross remain the primary ETP bird species of concern in the Alaska fisheries, and this fishery has not caught any in recent years. The only recent seabird bycatch species are northern fulmar, shearwaters, kittiwakes, Laysan albatross, and gulls; none of these is an ESA-listed species.

Salmon
The bycatch of ESA-listed Chinook salmon by the BSAI flatfish fishery increased in 2019 but decreased again in 2019, and the amounts have been within the fishery's limit of 45,000 Chinook salmon. Data continue to be collected, and the bycatch numbers are analyzed annually (NFMS 2019a, b). However, likely due to Covid-19, the data were not analyzed in 2020. Any updated information will be reviewed during the 2021 surveillance audit.

No changes are evident which would affect the existing confidence ratings.

Monitoring and management regarding aquatic ecosystems (Supporting clauses 12.7, 12.8, 12.15)

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.

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).

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.

The EBS and AI Ecosystem Status Reports include continuing monitoring of a range of ecosystem indicators, all considered by the Council in the decision-making process (Siddon 2020; Ortiz and Zador 2020). However, Covid-19 has impacted many surveys and data collections. The team concludes that the risk is low though since the fishery has had a high level of monitoring in the past. It is expected that more information will be available at the 2021 surveillance audit.

No changes that would affect the existing confidence ratings are evident.

Monitoring and management regarding essential habitats (Supporting clauses 12.9, 12.13)

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.

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.

The most recent five-year review of EFH took place in 2016 using a new Fishing Effects model to assess the impacts of fishing activities on EFH (Simpson et al. 2017). Overall, fishing impacts in the flatfish core EFH area are very low. The average percentage impact for 2003-2016 was 4.5% in the BS and 1.9% in the AI, which is well below the 10% habitat impact that was established as the trigger for further analysis (https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/). On this basis, the Council agreed that the effects of fishing on EFH do not currently meet the threshold of more than minimal and not temporary, and mitigation action is not needed at this time. In addition, the final environmental assessment for EFH Omnibus Amendments was published in June 2018. Amendment 115 is the relevant omnibus amendment to the FMP for the groundfish fishery of the BSAI (NMFS 2018). Based on the most recent five-year review of EFH, the Council determined that new habitat and life history information is available to revise many of the EFH descriptions and maps. These amendments (115 for the BSAI) to the EFH provisions in the Council's FMPs would not substantively change the impacts of EFH as analyzed in the 2005 EFH EIS. The 2015 EFH five-year review concluded that no change to the conclusions of the evaluation of fishing effects on EFH is warranted based on new information. None of the FMP amendments require regulatory action. The next EFH review is scheduled for 2022.

No changes that would affect the existing confidence ratings are evident.

Changes to Fundamental Clause Confidence Ratings:

There are no changes in the management of fisheries that would detrimentally affect performance against the confidence ratings for the fundamental clauses and any supporting clauses.

Conformance:

Conformance level: High. Non-conformance: None

Fundamental Clause 13

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

No. supporting clauses	19
Applicable supporting clauses	0
Non-applicable supporting clauses	19
Overall level of conformity	NA
Non-conformance	NA

Evidence of continuous compliance with the fundamental clause: NA

Evidence of continuous compliance with the supporting clauses: NA

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.

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.

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.

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.

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.

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.

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.

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.

13.5.2 Steps shall be taken to minimize adverse genetic disease and other effects of escaped farmed fish on wild stocks.

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.

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.

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.

13.8 State shall consult with their neighboring States, as appropriate, before introducing non-indigenous species into trans-boundary aquatic ecosystems.

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, subregional, regional and global level.

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.

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 broodstocks, the introduction of non-native species, and in the production, sale and transport of eggs, larvae, fry, broodstock or other live materials. States shall facilitate the preparation and implementation of appropriate national codes of practice and procedures to this effect.

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.

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.

13.14 In the case of enhanced fisheries, “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.

Changes to Fundamental Clause Confidence Ratings:

NA

Conformance:

NA

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APPENDICES

Appendix 1 Stakeholder Submissions

Other than the client's annual update, no stakeholder comments were received during the annual surveillance activities.

ABOUT DNV

DNV is the independent expert in assurance and risk management, operating in more than 100 countries. Through its broad experience and deep expertise DNV advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

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