DNV

WHEN TRUST MATTERS

SURVEILLANCE NO. 4

Gulf of Alaska and Bering Sea and Aleutian Islands Pacific Cod Fisheries

Certification Body	DNV Business Assurance USA
Assessment Team	Jodi Bostrom, Paul Knapman, and Giuseppe Scarcella
Fishery Client	Alaska Fisheries Development Foundation
Date	June 9, 2022

Certified Sustainable
ALASKA RFM

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GLOSSARY

Abbreviations & acronyms

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
AI	Aleutian Islands
ASMI	Alaska Seafood Marketing Institute
AWT	Alaska Wildlife Troopers
B	Biomass
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CCRF	Code of Conduct for Responsible Fisheries
CDQ	Community Development Quota
CIE	Center for Independent Experts
CPUE	Catch per unit effort
CSC	Certified Seafood Cooperative
EBS	Eastern Bering Sea
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EIS	Environmental impact statement
EM	Electronic monitoring
ESA	Endangered Species Act
F	Fishing mortality
FAO	Food and Agriculture Organization of the United Nations
FMP	Fishery management plan
GOA	Gulf of Alaska
GHL	Guideline harvest level
HCR	Harvest control rule
LLP	License Limitation Program
MCS	Monitoring, control, and surveillance
MRA	Maximum retainable allowances
MSA	Magnuson-Stevens Fisheries Management and Conservation Act
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
mt	Metric tons
NBS	Northern Bering Sea
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
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
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
VMS	Vessel monitoring system

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 Pacific cod (*Gadus macrocephalus*) 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 Pacific cod 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 Fishery Conservation and Management Act (MSA). Within state waters, ADFG and the BOF manage the eight Pacific cod fisheries as "parallel" or state fisheries, conducted under federal total allowable catch (TAC), regulations and management measures. Parallel fisheries occur simultaneously with federal fisheries and state fisheries operate after the federal/parallel fisheries close and are based on guideline harvest levels (GHLs) set as percentages of the GOA federal allowable biological catch (ABC). The U.S. Coast Guard (USCG), the NMFS Office of Law Enforcement (OLE) and the Alaska Wildlife Troopers (AWT) and/or deputized ADFG staff, enforce fisheries regulations in federal and state waters, respectively.
2: Coastal area management frameworks	High	The NMFS and 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. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. With regards to conflict avoidance and resolution between different fisheries, the Council and the BOF tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourage stakeholder participation, and their deliberations are conducted in open, public sessions. The Community Development Quota (CDQ) Program was created by the Council in 1992 to provide western Alaska communities an opportunity to participate in BSAI fisheries. There are 65 communities within a 50-mile radius of the BS of the BSAI TACs for several species.
3: Management objectives and plan	Medium	The MSA is the primary domestic legislation governing the management of the U.S. marine fisheries. Under the MSA, 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 which incorporate the Pacific cod fisheries in those regions. Both FMPs present long-term management objectives for the Alaska Pacific cod fisheries. These are reviewed annually by the Council. In state waters, there are no explicit

Fundamental Clause	Evidence adequacy rating:	Justification:
		long-term objectives within any ADFG plan or any other management document with regard to state-managed Pacific cod fisheries.
4: Fishery data	High	The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the Pacific cod 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 first recorded through the e-landing (electronic fish tickets) catch recording system and secondly, collected by vessel captains in logbooks. Fishery independent data are collected in regular trawl and longline surveys of both the GOA and BSAI regions and additional fishery dependent data are collected by the extensive observer program present in both regions. Other sources of data are also considered during the stock assessment process.
5: Stock assessment	High	The NMFS has a well-established institutional framework for research developed within the Alaska Fisheries Science Center (AFSC). Scientists at the AFSC conduct research and stock assessments on Pacific cod in Alaska each year, producing annual SAFE reports for the federally managed Eastern Bering Sea (EBS), GOA, and AI Pacific cod stocks. (Only recently were separate SAFE reports done for the EBS and AI.) ADFG also conducts scientific research and surveys on its state-managed Pacific cod fisheries. 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 annual 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 (Center of Independent Experts' [CIE] reviews). The most recent stock assessments for GOA and EBS Pacific cod have shown large declines in biomass, and management actions have reduced the ABC and TAC levels. None of the three Pacific cod stocks are determined to have overfishing occurring.
6: Biological reference points and harvest control rule	High	The 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 specifies the maximum permissible ABC and of the overfishing level (OFL) for each stock in the complex. Stocks in tier 3 are further categorized (a), (b), or (c) based on the relationship between biomass (B) and B40% (Tier 3). The category assigned to a stock 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 BMSY level (biomass relative to maximum sustainable yield [MSY]) within a specified timeframe. For Pacific cod and some other stocks, there is an additional threshold, B20%, used as a measure to protect Steller sea lions. The

Fundamental Clause	Evidence adequacy rating:	Justification:
		2021 SAFE report indicates that 2022 GOA Pacific cod stock is above B17.5% and B20%.
7: Precautionary approach	High	Precautionary approach (PA)-based reference points are used in the management of the Pacific cod 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 Alaska groundfish fisheries. First, 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 Pacific cod 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 EBS and GOA Pacific cod stocks are categorized as Tier 3 while the AI stock is Tier 5. The third component is the 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. From this legislation and Council objectives, the management system for the Alaska groundfish fisheries has developed into a complex suite of measures comprised of harvest controls (e.g., 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, 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). 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.
9: Appropriate standards of fisher's competence	High	The State of Alaska enhances through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishers are maintained along with their qualifications.
10: Effective legal and administrative framework	High	The Alaska Pacific cod fishery uses enforcement measures including vessel monitoring systems (VMSs) on board vessels, USCG boardings and inspection activities. The USCG and NMFS's 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 Notices of Violation and Assessment or can refer

Fundamental Clause	Evidence adequacy rating:	Justification:
		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, 4) Criminal prosecution of the owner or operator for some offenses. In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 NOAA Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The AWT enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation. The low proportion of violations encountered during at-sea patrols of the Alaska fisheries demonstrates effective deterrence. No recent sanctions have been applied by State of Alaska authorities in the state Pacific cod fisheries and ADFG staff consider that sanctions are effective deterrents.
12: Impacts of the fishery on the ecosystem	High	The Council, 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	NA: Not an enhanced fishery

1.2 Audit conclusion

Fishery	Status of certification	Comment
The **Pacific cod** commercial fishery employing bottom trawl, longline, pot, and jig gears within Alaska jurisdiction (200 nm U.S. EEZ) and subjected to federal (NMFS and Council) and state (ADFG and BOF) management.	**Certified**	Following the results of the 4th surveillance audit finalized in June 2022, the assessment team concludes that the Responsible Fisheries Management (RFM) Certificate for this fishery shall remain active until the certificate expiry date of December 5, 2022. This is contingent on the client's progress to the close the non-conformance. See Appendix 2 for more details.

2 GENERAL INFORMATION

Table 1. General information

Fishery name	Alaska Pacific Cod Fishery		
Units of Assessment	Applicant Group:	Alaska Cod Fishery Client Group	
	Product Common Name (Species):	Pacific cod (*Gadus macrocephalus*)	
	Geographic Location:	GOA and BSAI within Alaska jurisdiction (200 nm EEZ)	
	Gear Types:	Bottom trawl, longline, pot, and jig gears	
	Principal Management Authority:	Federal (NMFS and the Council) and state (ADFG and BOF)	
Date certified	December 6, 2017	Date of certificate expiry	December 5, 2022
Surveillance type	Off-site surveillance/document review		
Date of surveillance audit	February-June 2022		
Surveillance stage	1st Surveillance		
	2nd Surveillance		
	3rd Surveillance		
	4th Surveillance	**X**	
	Other (expedited, etc.)		
Surveillance team	Lead assessor: Jodi Bostrom Assessor: Paul Knapman, Giuseppe Scarcella		

This report contains the findings of the fourth annual RFM Fisheries surveillance audit conducted for the Alaska Pacific cod fishery during the week of January 17, 2022.

The Alaska RFM program is a voluntary program that has been developed by 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

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.

Paul Knapman
Main areas of responsibility
Fundamental clause A (The Fisheries Management System), D (Management Measures) and E (Implementation Monitoring and Control)

Paul is an independent consultant based in Halifax, Nova Scotia, Canada. Paul began his career in fisheries more than 30 years ago as a fisheries officer in the UK, responsible for the enforcement of UK and EU fisheries regulations. He then joined the UK government's nature conservation advisors, establishing and managing their marine fisheries program. He developed an extensive program of work with fisheries managers, scientists, the fishing industry and ENGOs to integrate national and European fisheries and nature conservation requirements. He also helped lead a national four-year project contributing to the 2002 review of the Common Fisheries Policy. He then became Head of the largest inshore fisheries management organization in England, with responsibility for managing an extensive area of inshore fisheries on the North Sea coast. The organization's responsibilities and roles included: stock assessments; habitat monitoring; setting and ensuring compliance with total allowable catches and quotas; establishing and applying regional fisheries regulations; the development and implementation of fisheries management plans; the lead authority for the largest marine protected area in England. In 2004, Paul moved to Canada and established his own consultancy providing analysis, advisory and developmental work on fisheries management policy in Canada and Europe. He drafted the first management plan for one of Canada's marine protected areas, undertook an extensive review on illegal, unreported, and unregulated fishing in the Baltic Sea and was appointed as rapporteur to the European Commission's Baltic Sea Regional Advisory Council. In 2008, Paul joined Moody Marine as their Americas Regional Manager, responsible for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul returned to consultancy in 2015.

Giuseppe Scarcella
Main areas of responsibility
Fundamental clause B (Science and Stock Assessment activities), and C (The precautionary approach)

Giuseppe Scarcella is an experienced fishery scientist and population analyst and modeler, 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

Following the fourth surveillance audit, a non-conformance was placed on Fundamental Clause 3. (See Appendix 2 for more details.) 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 http://www.alaskaseafood.org/rfm-certification/certified-fisheries/alaska-cod/ and from client and stakeholder interviews. Recent catch in EBS and AI is lower than in previous years whereas catch in GOA is higher. Recent data are presented in Table 2.

Table 2. TAC and catch data for 2021

Species	Latin name	2021 TAC (metric ton; mt)	2021 Total Catch (mt)
Pacific cod in EBS	*Gadus macrocephalus*	111,380	108,818
Pacific cod in AI	*Gadus macrocephalus*	13,796	7,287
Pacific cod in GOA	*Gadus macrocephalus*	17,321	13,303

4.2 Original Assessment and previous surveillance audits

The Alaska BSAI and GOA Pacific cod fisheries were first certified under the requirements of the Alaska RFM standard v1.2 on April 17, 2013. The initial certification and four annual surveillance audits were carried out by the certification body Global Trust.

On April 15, 2017, the certificate for this fishery was transferred from Global Trust to DNV GL (now DNV). The certificate transfer and the fourth surveillance audit were carried out by DNV. During June-December 2017, the fishery went through the full re-assessment against a newer version of the standard, v1.3. This re-assessment did not result in any changes in the compliance of the fishery with the RFM standard, and no non-conformances were raised. The new certificate was, therefore, issued with the validity date until December 5, 2022.

In March 2020, the third surveillance of the recertification took place via an off-site surveillance/document review, and the surveillance report was issued on May 14, 2021. Following the results of the third surveillance audit, the assessment team concluded that the RFM certificate for this fishery shall remain active until the certificate expiry date of December 5, 2022, pending the outcome of the fourth annual surveillance.

5 THE ASSESSMENT PROCESS

5.1 Meetings attended

Due to the ongoing Covid-19 pandemic, an on-site audit was not feasible. Therefore, the fourth annual surveillance audit, in conjunction with the second reassessment site visit, was done remotely via video conferencing technology. See Table 3 for the meeting agenda.

Table 3. Surveillance audit and site visit agenda

Date	Topic	Attendees	All Times PST
January 18th	RFM/MSC site visit opening meeting with pollock clients	Austin Estabrooks (APA) Julie Bonney (AGDB) Jason Anderson (GFF) Mark Fina (GFF) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	9-10 am
	RFM/MSC site visit opening meeting with Pacific cod client group	Tommy Sheridan (AFDF) Julie Decker (AFDF) Jim Armstrong (FLC) Mark Fina (GFF) Austin Estabrooks (APA) Julie Bonney (AGDB) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	10-11 am
	RFM/MSC site visit meetings for pollock and Pacific cod with AFSC	Jim Ianelli (AFSC; EBS pollock) Steve Barbeaux (AFSC; AI pollock & GOA & EBS Pacific cod) Ingrid Spies (AFSC; AI Pacific cod) Shannon Fitzgerald (AFSC; seabirds) Cole Monnahan (AFSC; GOA pollock) Sandra Lowe (AFSC) Anne Hollowed (AFSC) Tommy Sheridan (AFDF) Julie Decker (AFDF) Jason Anderson (GFF) Kerim Aydin (AFSC; BS ecosystem; available via email) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	11 am-4 pm
January 19th	RFM/MSC site visit meeting with NMFS AKRO Staff	Mary Furuness (AKRO) Steve Whitney (AKRO) Stephanie Warpinski (AKRO) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor)	9-10 am

		Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	
	RFM/MSC site visit meeting with NMFS OLE	Wynn Carney (OLE) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Eileen Ekstrom (ANAB)	10-11 am
	RFM/MSC site visit meeting with NMFS Habitat Division	John Olson (NMFS) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	11 am-12 pm
	RFM/MSC site visit meeting with FMA - Observer Program	Jennifer Ferdinand (FMA) Ruth Christianson (FMA) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	2-3 pm
	RFM/MSC site visit meeting with NPFMC Staff	Dave Witherell (NPFMC) Diana Stram (NPFMC) Diana Evans (NPFMC) Sara Cleaver (NPFMC) John McCracken (NPFMC) Sara Rheinsmith (NPFMC) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	5-6 pm
January 20th	RFM/MSC site visit meeting with USCG	LCDR Jedediah Raskie (USCG) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	9-10 am
	RFM/MSC site visit meeting with ADF&G Staff	Forrest Bowers (ADF&G) Jan Rumble (ADF&G) Mark Stichert (ADF&G)	10 am-12 pm

		Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	
	RFM/MSC site visit meeting with BOF Staff	Glenn Haight (BOF) Tommy Sheridan (AFDF) Julie Decker (AFDF) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Erin Wilson (MRAG) Amanda Stern-Pirlot (MRAG) Eileen Ekstrom (ANAB)	2-3 pm
January 21st	RFM/MSC site visit closing meeting with pollock fishery clients	Austin Estabrooks (APA) Chris Barrows (PSPA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Eileen Ekstrom (ANAB)	9-10 am
	RFM/MSC site visit closing meeting with Pacific cod client group	Tommy Sheridan (AFDF) Julie Decker (AFDF) Jim Armstrong (FLC) Mark Fina (GFF) Jason Anderson (GFF) Chris Barrows (PSPA) Austin Estabrooks (APA) Giuseppe Scarcella (DNV and MRAG subcontractor) Paul Knapman (DNV subcontractor) Jodi Bostrom (DNV) Erin Wilson (MRAG) Eileen Ekstrom (ANAB)	10-11 am

5.2 Stakeholder input

The fourth annual surveillance audit for this fishery was publicly announced on December 15, 2021. The assessment team received an update from the client covering changes since the last surveillance and met with various stakeholders as noted in Table 3. No other stakeholder input was received.

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:

While Covid-19 has resulted in challenges for the industry and management authorities over the last 2 years, by necessity there have been adaptations to working approaches, but these have not resulted in significant material changes since the last surveillance audit.

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 Pacific cod, 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. NOAA's 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 eight Pacific cod fisheries (Kodiak, Chignik, South Alaska Peninsula, Aleutian Islands, Southeast Alaska, Prince William Sound [PWS], Cook Inlet, and Dutch Harbor) are supported by area-specific stock assessment surveys as well as shared information from federal assessments. The ADFG and the BOF manage the state Pacific cod fishery as "parallel" or state fisheries. Parallel fisheries are conducted under federal TACs, regulations and management measures. State fisheries operate after the federal/parallel fisheries close and are based on GHL which, for Pacific cod, are based on 8% of Pacific cod ABC (27% of AI ABC for the Aleutian Islands fishery). 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. The AWT provide input into the development of regulations and are responsible for their enforcement at-sea and ashore.

The assessment models used take into account all sources of F and are based on complete catch reporting systems including extensive observer data. Catches from fisheries occurring in state-managed waters are included in the appropriate assessments. All retained catch and discards of Pacific cod are included in the total catch amounts input into the models. The assessments take into account various relevant aspects of Pacific cod biology and distribution. The assessments of EBS and GOA Pacific cod are age-structured, use a Bayesian approach, consider sources of uncertainty where possible, and evaluate stock status relative to reference points in a probabilistic way. Both EBS and GOA SAFE reports give extensive histories of the models used in the assessments (Thompson et al. 2021; Barbeaux et al. 2021). The AI Pacific cod assessment relies on survey biomass estimates and a simpler random effects model, although various age-structured models were examined and reported in the recent SAFE report (Spies et al. 2021).

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 is also in operation. The MSA authorizes and requires the collection of cost recovery fees for limited access privilege programs, such as the CDQ Program. 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 Alaska Pacific cod 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. Since January/February of 2020, as a result of the pandemic, all Council meetings have been web-based and, at the time of writing this audit report, continue to be. BOF meetings were web-based between September 2020 through October 2021 and mostly returned to in-person meetings thereafter.

Stock status is reviewed and updated annually, producing SAFE reports for the federally managed GOA, EBS, and AI Pacific cod stocks with the most recently completed in December 2021 (Thompson et al. 2021; Barbeaux et al. 2021; Spies et al. 2021). ADFG also conducts scientific research and surveys on its 8 state-managed Pacific cod fisheries. The 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 the BOF (and ADFG) provide substantial amounts of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourage stakeholder participation, and all Council and BOF deliberations are conducted in open, public sessions. Anyone may submit regulatory proposals, and all such proposals are given due consideration by both the Council and the BOF.

The current RFM assessment/certification document states that Pacific cod stocks in Alaska are not considered to be transboundary, straddling, highly migratory, or high seas stocks. Thus, several sub-clauses in this fundamental clause have not been scored in that certification report, and subsequently in this surveillance audit. Research conducted in 2018 indicates that the genetic samples from the Northern Bering Sea (NBS) survey in 2017 are very similar to those from the EBS survey area and quite distinct from samples collected in the AI and the GOA (Spies et al. 2021). In addition, analyses indicated that the NBS samples were unlikely to be from a population that was not sampled, such as Russia. During discussion of the EBS stock assessment in the Council process, it was pointed out that the current distribution of Pacific cod within the Bering Sea was unprecedented, and that there was uncertainty regarding the migration of Pacific cod between NBS, EBS, GOA, and areas outside the U.S. EEZ.

Evidence of continuous compliance with the supporting clauses

There is no material change in compliance with any of the following supporting clauses. The Pacific cod 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	8
Non-applicable supporting clauses	2 (2.1.1, 2.7)
Overall level of conformity	High
Non-conformance	None

Evidence of continuous compliance with the fundamental clause:

In managing the Alaska Pacific cod 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 Pacific cod 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 Pacific cod stock is 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 to hold public meetings within the Alaska region to discuss the development and amendment of FMPs. Since January/February 2020, all Council meetings have been web-based due to the pandemic and are expected to become hybrid in person/virtual meetings in the early part of 2022. 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. BOF meetings were web-based between September 2020 through October 2021, due to the Covid-19 pandemic, and mostly returned to in-person meetings thereafter. 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, including pollock, halibut, Pacific cod (10% of total BSAI quota), crab and bycatch species.

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 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. Clauses 2.1.1 and 2.7 are 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	Medium
Non-conformance	1

Evidence of continuous compliance with the fundamental clause:

The Council has in place groundfish FMPs (NPFMC 2020a, b) in the BSAI and GOA that include the Pacific cod 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 similar to the Council objectives. However, in the course of this audit, it became apparent that these guiding principles had been repealed in March 2013, and no other document with long-term management objectives has been adopted within any ADFG plan or other management document with regard to the state managed Pacific cod fisheries.

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. Of these fisheries, Pacific cod is the predominant groundfish species targeted by the fixed gear sectors. In 2009, the Council took action to add gear-specific Pacific cod endorsements to GOA fixed gear licenses that met a minimum catch threshold during 2002-2008. This action reduced the number of fixed gear licenses eligible to access the GOA Pacific cod fisheries by 75%. As a result, the number of participants in the directed GOA Pacific cod fisheries will be permanently capped at the number of available licenses and new entrants will have to purchase an existing license if they wish to fish in federal waters.

ADFG annually issues an emergency order creating parallel Pacific cod seasons inside state waters (0-3 nm) of the Kodiak, Chignik, and South Alaska Peninsula management areas. Vessels participating in parallel Pacific cod fisheries are not required to possess an LLP permit. 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 Pacific cod 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 Pacific cod fisheries, based on targets, limits, and pre-defined harvest control rules (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. 2021), and each stock assessment SAFE also contains extensive economic data.

In the 2017 assessment of GOA Pacific cod, large declines in stock size were noted, believed to be related to increased natural mortality in 2014-2016 brought on by very warm oceanographic conditions (Barbeaux et al. 2017). Pacific cod catches in 2017 in GOA were well below the TAC, and the 2017 assessment established the basis for steep declines in ABC and OFL, and subsequently the TAC, for the 2018 fishery. Each of these values declined by about 80% from 2017 to 2018. This decline was not observed in the EBS and AI assessments, although substantial declines in survey abundance estimates were observed in EBS after 2014. The 2018 stock assessment of GOA Pacific cod (Barbeaux et al. 2018) confirmed the decline, and projected an increase in total Pacific cod biomass, but essentially no increase in female spawner biomass, in 2019 and 2020. Estimated end of year catch in 2018 for GOA Pacific cod was 13,096 t, compared to 64,442 t in 2017 (Table 2.3, Barbeaux et al. 2018). As was done in the previous year, a value of 17,000 t was recommended for ABC in 2019, down from the maximum ABC calculation of 19,665 t, to maintain the GOA stock in 2020 above the unfished spawning stock biomass (SSB, B20%), which is the threshold for closure of directed fishing to protect Steller sea lions (Barbeaux et al. 2018; NPFMC 2020a).

In 2020, SSB was projected to have dropped below B20% and the federal Pacific cod fishery in the GOA was closed by regulation to directed Pacific cod fishing. The Alaska State directed Pacific cod fishery remained open and Pacific cod bycatch in other federally managed groundfish fisheries was allowed. The Pacific cod ABC for 2020 was set to 14,621 t, but the combined TAC and Alaska State GHL was reduced to account for additional uncertainty. The Alaska State managed fisheries are allocated 26.7% of the GOA Pacific cod ABC. The federal Pacific cod TAC was reduced by 40% from the maximum of 10,719 t as a further level of precaution to 6,431 t. ADFG also reduced their maximum prescribed harvest limit of 3,902 t by 35% to 2,537 t. This resulted in a total combined federal TAC and Alaska State GHL of 8,968 t or 61% of the maximum ABC. In 2020 a total combined catch of 6,233 t was harvested (Table 2.2, Barbeaux et al. 2021), the state having taken 2,318 t (91% of the GHL) and federal fisheries having taken 3,916 t (61% of the federal TAC). The catch in the federal fisheries were split primarily between the arrowtooth flounder (1,237 t), walleye pollock (1,040 t), and shallow water flatfish fisheries (938 t).

In 2021, the stock was projected to be above B20%, and the federal fishery was once again allowed to open (Barbeaux et al. 2021). The federal TAC was set at 17,321 t and state GHL set at 5,864 t. As of December 31, 2021, a total of 19,176 t (81% of the ABC) had been harvested (NMFS 2022). State fisheries had harvested 5,830 t (99% of the GHL) (Alaska Department of Fish and Game 2022), and federal fisheries 13,303 t (77% of the TAC) through December 31, 2021. In 2021, 40% of the Pacific cod catch was by pot gear, 31% by trawl, and 23% by longline, while jig and other gear harvested less than 6% (NMFS 2022).

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 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 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).

Management actions are set out in the BSAI and GOA FMPs.

Evidence of continuous compliance with the supporting clauses

There is a material change in compliance with supporting clause 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", but no change for 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.

At the last assessment of the fishery (2017), it was concluded that both the federal and state components of the management systems met the requirements of supporting clause 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."

At this 4th annual audit of the fishery, the re-assessment of the fishery against version 2.1 of the RFM standard also commenced. In the course of discussions associated with the re-assessment with regard to supporting clause 3.1, it became clear that the state component of the management system did not meet the requirements of the clause. This came to light when information showed that 5 ACC 28.089 [Guiding principles for groundfish fishery regulations, 1996] that was introduced and applied to ADFG's initial groundfish management plans had been repealed in March 2013 and, in so doing, removed the only piece of ADFG documentation that explicitly sets out "long term management objectives in a plan or other

management document (taking into account uncertainty and imprecision) and be subscribed to by all interested parties" in relation to the state managed Pacific cod fisheries. As a result, a minor non-conformance is raised. See Appendix 2 for the client's action plan.
Conformance: Conformance level: Medium. Non-conformance: 1

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	10
Supporting clauses not applicable	3 (4.9, 4.10, 4.11)
Overall level of conformity	High
Non-Conformances	None

Evidence of continuous compliance with the fundamental clause:

NMFS and ADFG collect fishery data and conduct fishery independent surveys to assess the Pacific cod fisheries and ecosystems in GOA and BSAI areas. Information for assessing the status of Pacific cod come from the SAFE reports; EBS (Thompson et al. 2021), AI (Spies et al. 2021), GOA (Barbeaux et al. 2021). SAFE reports provide complete descriptions of the data collected and used in the annual assessments, used to determine stock status and harvest recommendations for the Alaska Pacific cod 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 Pacific cod 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 GHL 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 (EM) to integrate video monitoring into the Observer Program to improve data collection. On August 8, 2017, NMFS published a final rule to integrate EM into the Observer Program (Ganz et al. 2018). Observer coverage in the EBS Pacific cod fishery has been at or near 100% for the past several years, while in the GOA, lower coverage rates exist. Detailed annual reports (e.g., Ganz et al. 2018, Alaska Fisheries Science Center and Alaska Regional Office 2021) from the Observer Program can be found on NMFS website and provide extensive information on the Observer Program, including observer deployments, coverage rates, and data collections.

Vessels less than 40 ft. are in the no-selection pool for observer coverage. However, in Pacific cod fisheries, the amount of Pacific cod taken by vessels <40 ft. length overall was less than 1% of the total catch in recent years. NMFS and ADFG have extensive scientific databases which include Pacific cod, and the Council has substantial information on management of Pacific cod 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. 2021) on social/cultural/economic value of the Alaska fisheries resources are produced, which include extensive information on the Alaska Pacific cod fisheries. Individual Pacific cod assessment SAFE reports have extensive sections on the economic performance of the fisheries.

Alaska supports both the 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	7
Supporting clauses not applicable	0
Overall level of conformity	High
Non-conformances	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 the MSY of the groundfish complex as well as its component species groups, assessments on the stock condition of individual species groups; assessments of the impacts on the ecosystem of harvesting the groundfish complex at the current levels given the assessed condition of stocks, including consideration of rebuilding depressed stocks; and alternative harvest strategies and related effects on the component species groups.

The SAFE documents are reviewed first by the Council's Groundfish Plan Team, then by the Scientific and Statistical Committee (SSC) and the 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. The AFSC periodically requests a more comprehensive external review of groundfish stock assessments by the 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 makeup 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, the CIE routinely conducts stock assessment reviews using leading international experts in stock assessments for Alaska fisheries. The GOA cod stock assessment was reviewed by three CIE reviewers in 2018 (https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2018). Similarly, the EBS Pacific cod assessment was reviewed by three external reviewers from the CIE in April-June 2021, and their reports are available at:

https://www.st.nmfs.noaa.gov/Assets/Quality-Assurance/documents/peer-review-reports/2021/2021_06%20Jiao%20EBS%20Pacific%20cod%20assessment%20report.pdf

https://www.st.nmfs.noaa.gov/Assets/Quality-Assurance/documents/peer-review-reports/2021/2021_06%20Magnusson%20EBS%20Pacific%20cod%20assessment%20report.pdf

https://www.st.nmfs.noaa.gov/Assets/Quality-Assurance/documents/peer-review-reports/2021/2021_06%20Sparholt%20EBS%20Pacific%20cod%20assessment%20report.pdf

Data collected by scientists from the many surveys and Pacific cod 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 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 2021; Ortiz and Zador 2021; Ferriss and Zador 2021) 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 Pacific cod. 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, Alaska. 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 fishery for Pacific cod is conducted entirely within the U.S. EEZ, there is also scientific cooperation with neighboring countries, such as Canada who fish for Pacific cod from adjacent stocks. The Technical Subcommittee 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 American 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 is, but Pacific cod is not). Each agency prepares a comprehensive annual report highlighting survey and research activities, including stock assessments. These reports are compiled into an annual Technical Subcommittee 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-conformances	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 PA, 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 2021 SAFE documents, none of the three Pacific cod stocks had overfishing occurring, as per the standard definitions applied to each stock.

The 2021 SAFE documents (referenced in Fundamental Clause 4 above) provide the status of Pacific cod 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 are presented to the Council, which look at numerous elements of the Alaska ecosystems (Siddon 2021, Ortiz and Zador 2021, Ferriss and Zador 2021).

The following section provides updates on stock assessment and status for each of the three Pacific cod stocks, based on the 2021 SAFE documents.

<u>EBS Pacific Cod</u>

According to the 2021 stock assessment, EBS Pacific cod is neither overfished nor experiencing overfishing. Stock status is determined relative to $B_{40\%}$ and $B_{35\%}$, which are regarded as reference points that trigger the harvest control rule. $B_{40\%}$ can be considered a proxy for B_{MSY} proxy reference point though it is really treated as a limit within management such that if female SSB is assessed as below $B_{40\%}$, maximum allowable fishing mortality rate (F_{OFL}) is reduced. 20% of virgin biomass can be considered a proxy of PRI. The summary of results from the 2021 stock assessment based on the SSC ensemble, are listed in Table 4 below (biomass and catch figures are in units of t). Following this table is a plot for this stock covering the period 1977-2022 indicating the stock is currently (and projected to stay) very close to both the F_{target} and B_{target} (Figure 1). Taking into account the trend of SSB relative to unexploited stock is possible to observe that in 2020 the stock is still above PRI (20% of SSB_0) and close to BMSY proxy (40% of SSB_0), the decrease forecasted in the period 2021-2023 does not bring the stock below PRI and keep in line with BMSY proxy.

Many changes have been made or considered in the stock assessment model since the 2020 assessment (Thompson et al. 2020). Following the recommendation from a review by the Centre for Independent Experts, an ensemble consisting of five models and a corresponding set of model weights was presented in 2021 as preliminary assessment: Model 19.12a is the current base model, and the other four models each differed from the base model with respect to a single, model-specific, feature. Model 19.12 included time-varying survey catchability, Model 21.1 allowed for the possibility that survey selectivity declines at larger sizes ("dome-shaped" selectivity), Model 21.2 incorporated a fishery catch per unit effort (CPUE) index as a relative measure of stock biomass, and Model 21.3 estimated a constant that is added to the standard deviation of each year's log-scale abundance index. After reviewing the preliminary assessment, the authors of the assessment requested that the five-model ensemble be included in this final assessment. The SSC agreed, for the most part, with the assessment author requested list, but suggested that Model 21.3 be omitted. Although the technical changes of the assessment approach the score in 1.2.4 remains unchanged, taking into account the changes represent an improvement of the previous model.

Table 4. Summary of the assessment results. Source: Thompson et al. 2021

Quantity	As estimated or *specified last* year for: 2021	2022	As estimated or *recommended this* year for: 2022*	2023*
M (natural mortality rate)	0.35	0.35	0.34	0.34
Tier	3b	3b	3b	3b
Projected total (age 0+) biomass (t)	754,000	786,566	879,978	848,615
Projected female spawning biomass (t)	228,219	205,906	259,789	254,585
$B_{100\%}$	659,545	659,545	686,761	686,761
$B_{40\%}$	263,818	263,818	274,704	274,704
$B_{35\%}$	230,841	230,841	240,366	240,366
F_{OFL}	0.37	0.33	0.38	0.37
$maxF_{ABC}$	0.30	0.27	0.31	0.31
F_{ABC}	0.30	0.27	0.31	0.31
OFL (t)	147,949	128,340	183,012	180,909
maxABC (t)	123,805	106,852	153,383	151,709
ABC (t)	123,805	106,852	153,383	151,709
Status	As determined *last* year for: 2019	2020	As determined *this* year for: 2020	2021
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 assumed catches of 123,805 t, and 153,383 t in 2021 and 2022, respectively.

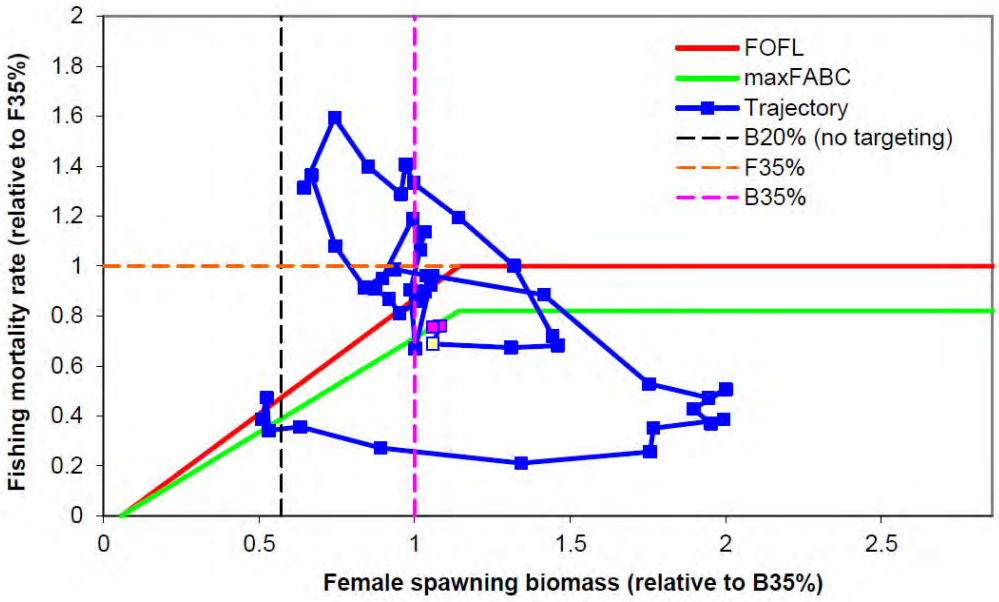

Figure 1. Trajectory of EBS Pacific cod fishing mortality and female SSB as estimated by ensemble model. Source: Thompson et al. 2021

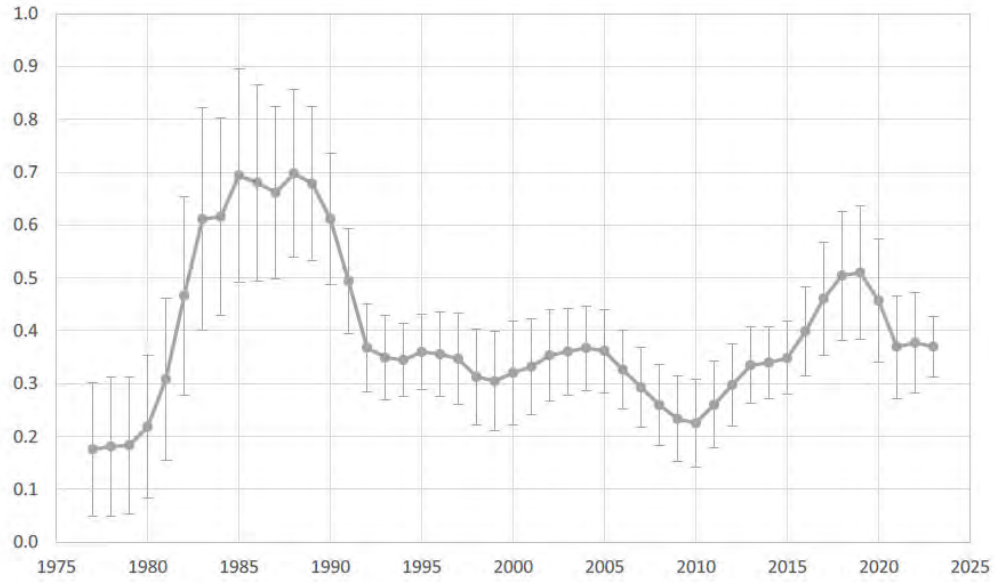

Figure 2. Ensemble estimates of relative SSB, +/− 2 standard deviations. Source: Thompson et al. 2021

In terms of management of the stock (harvest strategy and HCRs) and data collection, during the site visit was evidenced by the stakeholders that there wasn't any particular change (see Table 5), and the observer program was regularly in place no matter the issues due to COVID-19 pandemic.

AI Pacific Cod

Harvest specifications for AI Pacific cod have been based on Tier 5 methodology since the AI and EBS stocks were first managed separately in 2014. Several age-structured models of this stock have been explored in assessments since 2012. Spies et al. (2021) presented three age structured models for the Aleutian Islands Pacific cod stock using data from 1991 through 2021 and a Tier 5 status determination. A preliminary version of the assessment was presented to the BSAI Plan Team in September 2021 and to the SSC in September 2021.

The following changes have been made in the Aleutian Islands Pacific cod age structured assessment relative to the September 2021 preliminary report. In Spies et al. (2021), a Tier 5 model and three age-structured models are presented.

Changes in the input data:

- Age structured models: Age structured model were last presented for AI cod in 2019. Updated catch data was included for the full 2019 and 2020 fishing seasons, and through October 1, 2021. Fishery length frequency data was added for 2019 through 2021. There have been no Aleutian Islands surveys since 2018.
- Tier 5 model (Model 13.4): No new data was available for the Tier 5 model, as there has not been an Aleutian Islands survey since 2018.

Changes in the assessment methods:

- The September 2021 preliminary models considered two estimates for natural mortality, M, and several methods for calculating natural mortality. The September preliminary model considered M=0.34, which is consistent with the value of M used in the past several Aleutian Island assessments, and a higher value of M, 0.40.
- In the September model, the preferred maturity ogive was based on maturity records from observers. This value was used in Spies et al. (2021) assessment, and a version of the model using maturity based on a study by Stark (2007) was presented.
- In light of discussion with the Plan Team and SSC in September, three models are presented in Spies et al. (2021), and described here:
  - Model 19.0: Base age structured model with M=0.34, maturity ogive derived from observer collections of maturity values from Aleutian Islands cod.
  - Model 19.0a: Base age structured model except Stark (2007) maturity ogive.
  - Model 19.0b: Base age structured model except M=0.40. This is the authors' preferred model.

- Model 13.4: is the Tier 5 random effects model recommended by the Survey Averaging Working Group (http://www.afsc.noaa.gov/REFM/stocks/Plan_Team/2013/Sept/SAWG_2013_draft.pdf), which has been accepted by the Plan Team and SSC since the 2013 assessment for the purpose of setting AI Pacific cod harvest specifications.

Table 5. History of BSAI (1977-2013), EBS (2014-2021 left side) and AI (2014-2021 right side) Pacific cod catch, TAC, ABC, and OFL (t). Catch for 2021 is through September 26. Note that specifications through 2013 were for the combined BSAI region, so BSAI catch is shown rather than the EBS catches from Table 2.1 for the period 1977-2013. Source: Thompson et al. 2021

Year	Catch	TAC	ABC	OFL
1977	36,597	58,000	-	-
1978	45,838	70,500	-	-
1979	39,354	70,500	-	-
1980	51,649	70,700	148,000	-
1981	63,941	78,700	160,000	-
1982	69,501	78,700	168,000	-
1983	103,231	120,000	298,200	-
1984	133,084	210,000	291,300	-
1985	150,384	220,000	347,400	-
1986	142,511	229,000	249,300	-
1987	163,110	280,000	400,000	-
1988	208,236	200,000	385,300	-
1989	182,865	230,681	370,600	-
1990	179,608	227,000	417,000	-
1991	220,038	229,000	229,000	-
1992	207,278	182,000	182,000	188,000
1993	167,391	164,500	164,500	192,000
1994	193,802	191,000	191,000	228,000
1995	245,033	250,000	328,000	390,000
1996	240,676	270,000	305,000	420,000
1997	257,765	270,000	306,000	418,000
1998	193,256	210,000	210,000	336,000
1999	173,998	177,000	177,000	264,000
2000	191,060	193,000	193,000	240,000
2001	176,749	188,000	188,000	248,000
2002	197,356	200,000	223,000	294,000
2003	207,907	207,500	223,000	324,000
2004	212,618	215,500	223,000	350,000
2005	205,635	206,000	206,000	265,000
2006	193,025	194,000	194,000	230,000
2007	174,486	170,720	176,000	207,000
2008	171,277	170,720	176,000	207,000
2009	175,756	176,540	182,000	212,000
2010	171,875	168,780	174,000	205,000
2011	220,109	227,950	235,000	272,000
2012	250,899	261,000	314,000	369,000
2013	250,274	260,000	307,000	359,000
2014	238,698	246,897	255,000	299,000
2015	232,808	240,000	255,000	346,000
2016	247,599	238,680	255,000	390,000
2017	237,837	223,704	239,000	284,000
2018	199,897	188,136	201,000	238,000
2019	178,853	166,475	181,000	216,000
2020	155,639	141,799	155,873	191,386
2021	114,277	111,380	123,805	147,949

Year	Catch (t)	ABC	TAC	OFL
1991	9,797	229,000	229,000	-
1992	43,067	182,000	182,000	188,000
1993	34,204	164,500	164,500	192,000
1994	21,539	191,000	191,000	228,000
1995	16,534	328,000	250,000	390,000
1996	31,609	305,000	270,000	420,000
1997	25,164	306,000	270,000	418,000
1998	34,726	210,000	210,000	336,000
1999	28,130	177,000	177,000	264,000
2000	39,684	193,000	193,000	240,000
2001	34,207	188,000	188,000	248,000
2002	30,800	223,000	200,000	294,000
2003	32,456	223,000	207,500	324,000
2004	28,873	223,000	215,500	350,000
2005	22,693	206,000	206,000	365,000
2006	24,211	194,000	189,768	230,000
2007	34,354	176,000	170,720	207,000
2008	31,228	176,000	170,720	207,000
2009	28,581	182,000	176,540	212,000
2010	29,006	174,000	168,780	205,000
2011	10,888	235,000	227,950	272,000
2012	18,220	314,000	261,000	369,000
2013	13,608	307,000	260,000	359,000
2014	10,603	15,100	6,997	20,100
2015	9,216	17,600	9,422	23,400
2016	13,245	17,600	12,839	23,400
2017	15,202	21,500	15,695	28,700
2018	20,414	21,500	15,695	28,700
2019	19,200	20,600	14,214	27,400
2020	14,250	20,600	13,796	27,400
2021	12,882	20,600	13,796	27,400

The principal results of the present assessment, based on the authors' recommended model, are listed in the tables below. Two tables (Table 6) are provided, the first is based on the preferred Tier 3 model (Model 19.0b), and the second is based on a Tier 5 model. The Tier 3 ABCs and OFLs are higher than the Tier 5 assessment.

Plot and biomass time series from Model 19.0 are in reported in Figure 3 and Figure 4. SSB estimated by the Tier 3 Model 19.0b was 1.7 x $B_{35\%}$. Therefore, AI cod qualifies under Tier 3a. Catch of Pacific cod as of October 1, 2021 was 12,882 t. Over the past five years (2016-2020), 96.5% of the catch has taken place by this date. Therefore, the full year's estimate of catch in 2021 was extrapolated to be 13,351 t. This is lower than the average catch over the past five years of 16,484 t. The Tier 3 projected estimate of total biomass for 2022 was 179,370 t and the model projection of SSB for 2022, assuming catch for 2021 as described above, was 59,722 t. The 2022 and 2023, ABCs using Model 19.0b were higher than the Tier 5 estimates: 42,402 t (2022) and 43,211 t (2023). Despite evaluation by multiple Tier 3 age structured models, the lack of survey data since 2018 increases uncertainty in the age structured models. A risk table is included in this assessment describes uncertainty involved in providing management quantities for AI Pacific cod. Spies et al. (2021) recommended the Tier 5 ABC (20,600 t), citing an apparent decline in CPUE, lack of NMFS trawl survey since 2018, and climate-related concerns.

Taking into account the trend of biomass relative to unexploited stock is possible to observe that in 2020 the stock is still above PRI (20% of SSB_0) and above BMSY proxy (40% of SSB_0), the forecasted biomass in the period 2021-2023 shows an increase.

Table 6. Summary of the assessment results following Tier 3 model. Source: Spies et al. 2021

	As estimated or *specified* *last* year for:		As estimated or *recommended* *this* year for:	
Quantity	2021	2022	2022	2023
M (natural mortality rate)	0.34	0.34	0.34	0.34
Tier	5	5	3a	3a
Projected total (age 1+) biomass (t)	80,700	80,700	179,370 t	182,203 t
Projected female spawning biomass (t)	-	-	59,722 t	58,993 t
$B_{100\%}$	-	-	100,508 t	100,508 t
$B_{40\%}$	-	-	40,203 t	40,203 t
$B_{35\%}$	-	-	35,177 t	35,177 t
F_{OFL}	-	-	0.892	0.892
$maxF_{ABC}$	-	-	0.679	0.679
F_{ABC}	-	-	0.679	0.679
OFL	27,400	27,400	51,913 t	52,900 t
$maxABC$	20,600	20,600	42,402 t	43,211 t
ABC	20,600	20,600	20,600 t	20,600 t
Status	2019	2020	2020	2021
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

Note: Last year's assessment incorporated a Tier 5 model. Projections were based on annual catches of 13,351 t for 2021 and the mean of the past 5 years, 2017-2021 for 2022 (16,484 t).

Table 7. Summary of the assessment results following Tier 5 model. Source: Spies et al. 2021

	As estimated or *specified* *last* year for:		As estimated or *recommended* *this* year for:	
Quantity	2021	2022	2022	2023
M (natural mortality rate)	0.34	0.34	0.34	0.34
Tier	5	5	5	5
Biomass (t)	80,700	80,700	80,700	80,700
F_{OFL}	0.34	0.34	0.34	0.34
$maxF_{ABC}$	0.255	0.255	0.255	0.255
F_{ABC}	0.255	0.255	0.255	0.255
OFL	27,400	27,400	27,400	27,400
$maxABC$	20,600	20,600	20,600	20,600
ABC	20,600	20,600	20,600	20,600
Status	2019	2020	2020	2021
Overfishing	No	n/a	No	n/a

In term of management of the stock (harvest strategy and HCRs) and data collection, during the site visit was evidenced by the stakeholders that there was not any particular change (see Table 5), and the observer program was regularly in place no matter the issues due to COVID-19 pandemic.

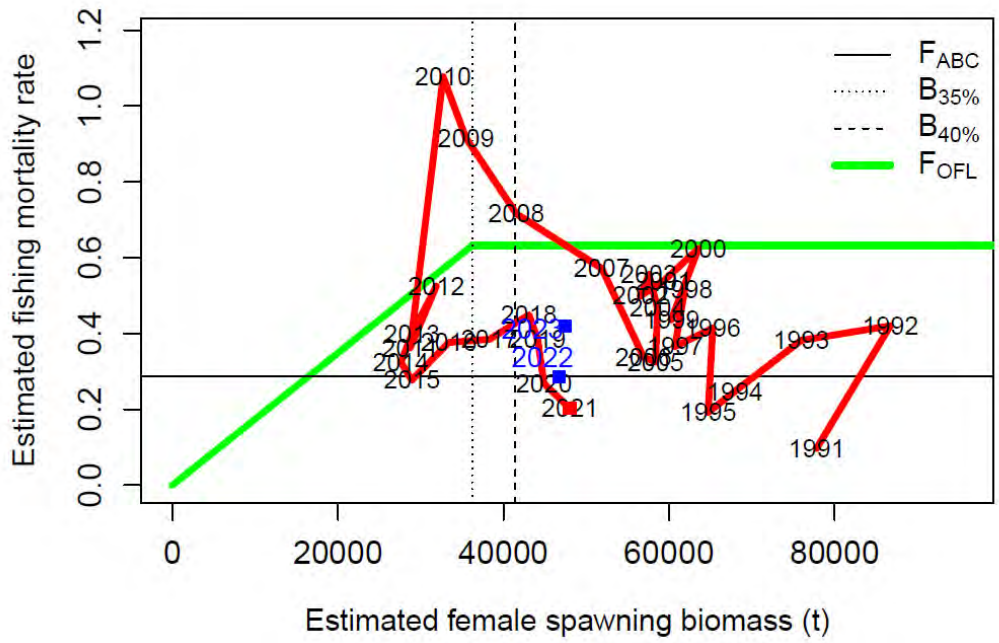

Figure 3. Phase plane diagram showing the time-series of stock assessment model estimates of female SSB relative to the harvest control rule, with assessment model results for 1991-2021 and projection model results for 2022 and 2023 (blue squares). Alternative 3 projections (fishing at the average fishing mortality rate for the past 5 years) were used for the 2022 and 2023 values. Source: Spies et al. 2021

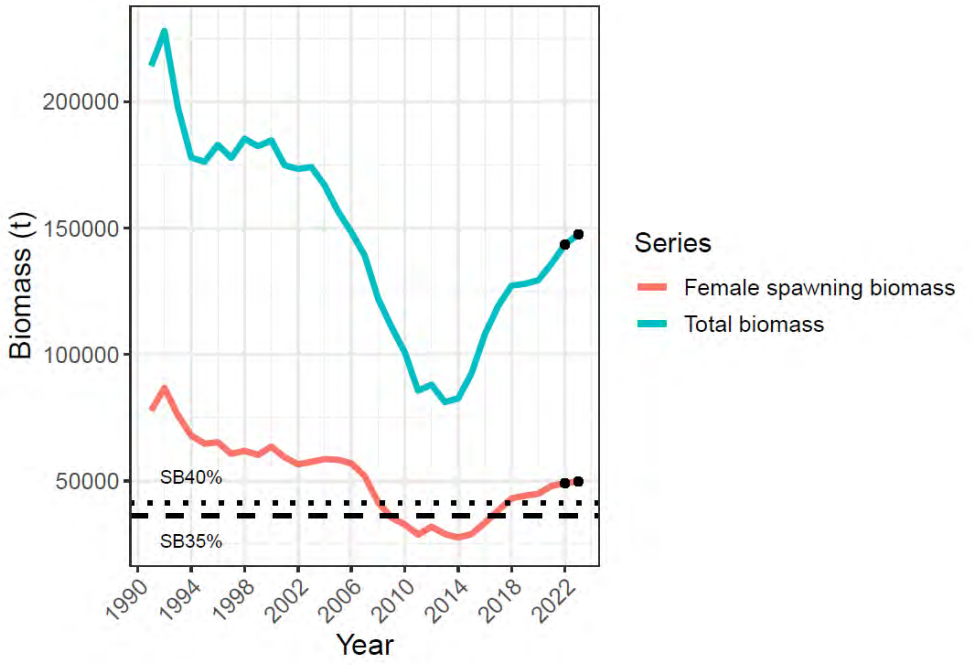

Figure 4. Estimates for total (age 1+) biomass and female SSB from 1991-2021, and projection model estimates for 2022 and 2023. Reference points $SB_{40\%}$ and $SB_{35\%}$ are shown as horizontal lines. Source: Spies et al. 2021

GOA Pacific cod

The estimate of the 2021 SSB is 39,873 t, well below the $B_{40\%}$ (surrogate for B_{MSY}) estimate of 72,045 t. Moreover, the 2021 assessment projection of the 2022 SSB is comprised between 35,050 t and 38,594 f, depending on the projection assumed (see following text, providing no evidence of retrospective bias in the assessment. The SBB estimate is above B_{20} (32,485 t), with lower confidence limit close or below this level (again depending on the projection).

Relative to last 2020 assessment, the following changes have been made in the current assessment:

Changes in the input data

1. Federal and state catch data for 2020 were updated and preliminary federal and state catch data for 2021 were included.
2. Commercial federal and state fishery size composition data for 2020 were updated, and preliminary commercial federal and state fishery size composition data for 2021 were included.
3. AFSC bottom trawl survey Pacific cod abundance and length composition data for 2021 were included.
4. AFSC longline survey Pacific cod abundance index and length composition data for the GOA for 2021 were included.
5. All length composition samples with less than 30 fish for a particular area, year, quarter, and gear type were excluded from the dataset. This made up 2% of the data representing < 1% of the overall catch.
6. Age-0 beach seine survey index was included in one alternative model.

Changes in the methodology

Model 19.1 is 2020 accepted model (Model 19.1) with the addition of the new data described above. There are two new models described in Barbeaux et al. (2021): Model 21.1, which is Model 19.1 but with a changed mortality block to 2015-2017 from 2014-2016 in Model 19.1 fit with the same prior for the base natural mortality, and Model 21.2 which has temperature dependent growth, heatwave dependent recruitment, and heatwave dependent natural mortality instead of the 2014-2016 block used in Model 19.1. In addition, 21.2 includes an age-0 beach seine survey index.

All three models presented in Barbeaux et al. (2021) are single sex age-based models with length-based selectivity. The models have data from three fisheries (longline, pot, and combined trawl fisheries) with a single season and two survey

indices (post-1990 GOA bottom trawl survey and the AFSC Longline survey indices). Length composition data are available for all three fisheries and both indices. In both models, growth is parameterized using the standard three parameter von Bertalanffy growth curve. In Model 21.2, the von Bertalanffy growth curve has additional link parameters on L2 and K which scale growth to the Climate Forecast System Reanalysis temperature at depth for 0-20 cm fish, and a link parameter on L1 which scales this parameter to an index of growth for larval Pacific cod based on the relationship of larval growth with temperatures published by Laurel et al. (2016). In Models 19.1 and 21.1, recruitment is parameterized as a standard Beverton-Holt with Sigma R is fixed at 0.44 and steepness is fixed at 1.0 for all three models. For Model 21.2, there is a parameter on R0 which scales it based on the spawning heatwave index. All scaling parameters are fit with non-informative priors. All selectivity estimates are fit using six parameter double-normal selectivity curves. For Model 21.2, the age-0 beach seine survey index is fit with an additional parameter which estimates variance of the index internally.

All three models performed well, and all three models produce similar results. Model 21.1 provided an overall better fit than Model 19.1; however, the fit made a trade-off in providing an improved fit to the longline survey, length composition, and recruitment while degrading the fit to the bottom trawl survey. Because of the addition of the beach seine survey index data Model 21.2 could not be directly compared to the other two models using overall likelihoods. Model 21.2 provided a better fit to all of the conditional age at length data. However, the seine data index was in conflict with the longline and trawl surveys resulting in a worse fit for these two. While all three models performed well in the retrospective analyses, Model 19.1 performed marginally better in the SSB retrospective analysis and Model 21.2 performed marginally better in the recruitment retrospective analysis. A leave-one-out analysis was performed where all data for a single year were removed back to 11 years and changes in the variance of parameters and derived quantities evaluated. In this analysis all three models performed similarly with rather low bias. However, Model 21.2 showed the least bias in the unfished SSB, 2022 SSB, and 2022 ABC. In particular, the removal of the 2021 data from Models 19.1 and 21.1 resulted in a substantial change in unfished SSB, 2022 SSB, and 2022 ABC, while the change in results from Model 21.2 were substantially lower. The largest differences among models were in the projections. Models 19.1 and 21.1 assume average 1977-2019 recruitment, growth, and natural mortality after 2020. For Model 21.2 the authors of the assessment presented two different assumptions; Projection A assumes environmental conditions after 2021 will match the 1977-2021 average, Projection B assumes that the environmental conditions after 2021 will match the 2012-2021 average. Projection B was provided because conditions for 2012-2021 in the GOA have been decidedly warmer than previous decades in the time series and projections by the IPCC suggests the warming trend will continue and worsen in the coming decades.

Key results for both projections are presented in and Table 8, Table 9 and Figure 5.

The data as interpreted through Model 21.2 indicates that the stock remains at low levels with poor recruitment since 2014. Although the 2017 and 2018 beach seine survey indicated higher densities of age-0 cod in those years, these fish failed to materialize at higher abundance in the 2019 - 2021 surveys or fisheries. Given selectivity in the fisheries and surveys, the high density of age-0 cod in the 2020 beach seine survey would not yet be collaborated by other data. Despite recent low recruitment, the stock was projected to either increase slowly (Projection A) or remain relatively stable (Projection B) due to low fishing levels in 2020 and 2021. Both projections have the stock at $B_{24.5\%}$ in 2022, however they differ in 2023 with Projections A at $B_{23.8\%}$ and Projection B at $B_{21.6\%}$ (Figure 6).

Table 8. Summary results of the assessment following projection A. Source: Barbeaux et al. 2021

M21.2 Projection A (Mean 1977-2021 conditions projected) Quantity	As estimated or *specified last* year for: 2021	2022	As estimated or *specified this* year for: 2022	2023
M (natural mortality rate)	0.47	0.47	0.48*	0.48*
Tier	3b	3b	3b	3b
Projected total (age 0+) biomass (t)	265,661	312,783	159,837	185,745
Female spawning biomass (t)				
Projected	39,977	50,813	39,873	38,594
$B_{100\%}$	180,111	180,111	162,426	162,426
$B_{40\%}$	72,045	72,045	64,970	64,970
$B_{35\%}$	63,039	63,039	56,849	56,849
F_{OFL}	0.41	0.54	0.54	0.52
$maxF_{ABC}$	0.33	0.43	0.44	0.42
F_{ABC}	0.33	0.43	0.44	0.42
OFL (t)	28,977	46,587	29,131	27,715
maxABC (t)	23,627	38,141	24,043	22,882
ABC (t)	23,627	38,141	24,043	22,882
Status	2019	2020	2020	2021
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

**Base natural mortality M varies between 0.48 and 1.07*
*** Assumed 2021 catch at the ABC, 23,627 t . For 2023 projections the 2022 catch was assumed to be at the projected ABC.*

Table 9. Summary results of the assessment following projection A. Source: Barbeaux et al. 2021

M21.2 Projection B (Mean 2010-2021 conditions projected) Quantity	As estimated or *specified last* year for: 2021	2022	As estimated or *specified this* year for: 2022	2023
M (natural mortality rate)	0.47	0.47	0.48*	0.48*
Tier	3b	3b	3b	3b
Projected total (age 0+) biomass (t)	265,661	312,783	160,755	169,832
Female spawning biomass (t)				
Projected	39,977	50,813	39,873	35,050
$B_{100\%}$	180,111	180,111	162,426	162,426
$B_{40\%}$	72,045	72,045	64,970	64,970
$B_{35\%}$	63,039	63,039	56,849	56,849
F_{OFL}	0.41	0.54	0.54	0.47
$maxF_{ABC}$	0.33	0.43	0.44	0.38
F_{ABC}	0.33	0.43	0.44	0.38
OFL (t)	28,977	46,587	28,000	22,072
maxABC (t)	23,627	38,141	23,099	18,170
ABC (t)	23,627	38,141	23,099	18,170
Status	2019	2020	2020	2021
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	Yes
Approaching overfished	n/a	No	n/a	Yes

**Base natural mortality M varies between 0.48 and 1.07*
*** Assumed 2021 catch at the ABC, 23,627t . For 2023 projections the 2022 catch was assumed to be at the projected ABC.*

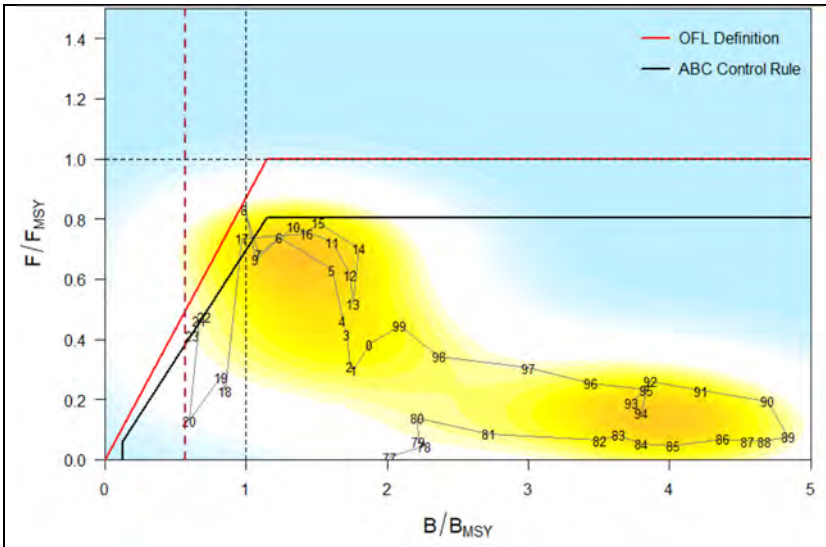

Figure 5. For Model 21.2 ratio of historical F/F_{MSY} versus female SSB relative to B_{MSY} for GOA pacific cod, 1977-2023. Note that the proxies for F_{MSY} and B_{MSY} are $F_{35\%}$ and $B_{35\%}$, respectively. The Fs presented are the sum of the full Fs across fleets. Dashed line is at $B_{20\%}$, Steller sea lion closure rule for GOA Pacific cod. Source: Barbeaux et al. 2021

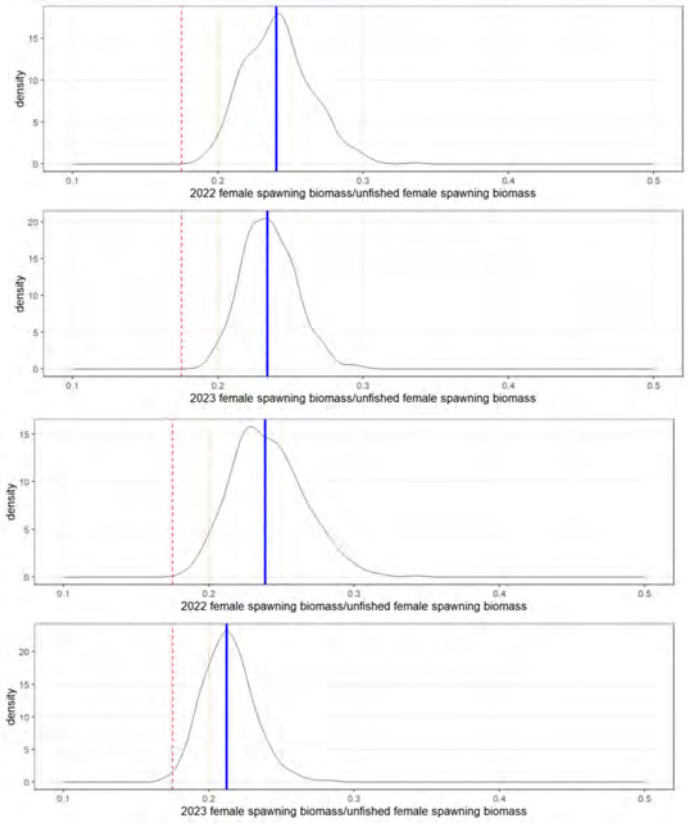

Figure 6. Model 21.2 MCMC Projection A (left panels) and B (right panels) posterior distributions of the 2022 (top) and 2023 (bottom) SSB ratio with estimates for SSB20% (orange dotted line) and SSB17.5% (Red dashed line) from the projection model, and posterior median (blue solid line) for beginning year 2022 and 2023. Source: Barbeaux et al. 2021

Table 9. History of GOA Pacific cod catch (t, includes catch from State waters), Federal TAC (does not include State guideline harvest level), ABC, OFL and Alaska State GHL (1997-Present). ABC was not used in management of GOA groundfish prior to 1986. Catch for 2021 is current through 2021-10-04 and includes catch from Alaska state waters fisheries and inside waters. The values in the column labeled "TAC" correspond to "optimum yield" for the years 1980-1986, "target quota" for the year 1987, and true TAC for the years 1988-present. The ABC value listed for 1987 is the upper bound of the range. Source: Barbeaux et al. 2021

Year	Catch	TAC	ABC	OFL	GHL
1980	35,345	60,000	-	-	-
1981	36,131	70,000	-	-	-
1982	29,465	60,000	-	-	-
1983	36,540	60,000	-	-	-
1984	23,898	60,000	-	-	-
1985	14,428	60,000		-	-
1986	25,012	75,000	136,000	-	-
1987	32,939	50,000	125,000	-	-
1988	33,802	80,000	99,000	-	-
1989	43,293	71,200	71,200	-	-
1990	72,517	90,000	90,000	-	-
1991	76,328	77,900	77,900	-	-
1992	80,747	63,500	63,500	87,600	-
1993	56,488	56,700	56,700	78,100	-
1994	47,485	50,400	50,400	71,100	-
1995	68,985	69,200	69,200	126,000	-
1996	68,280	65,000	65,000	88,000	-
1997	68,476	69,115	81,500	180,000	12,385
1998	62,121	66,060	77,900	141,000	11,840
1999	68,614	67,835	84,400	134,000	16,565
2000	54,508	59,800	76,400	102,000	17,685
2001	41,619	52,110	67,800	91,200	15,690
2002	42,345	44,230	57,600	77,100	13,370
2003	52,582	40,540	52,800	70,100	12,260
2004	56,624	48,033	62,810	102,000	14,777
2005	47,584	44,433	58,100	86,200	13,667
2006	47,897	52,264	68,859	95,500	16,595
2007	52,261	52,264	68,859	97,600	16,595
2008	59,014	50,269	64,493	88,660	16,224
2009	53,196	41,807	55,300	66,000	13,493
2010	78,325	59,563	79,100	94,100	19,537
2011	85,412	65,100	86,800	102,600	21,700
2012	77,918	65,700	87,600	104,000	21,900
2013	68,600	60,600	80,800	97,200	20,200
2014	84,840	64,738	88,500	107,300	23,762
2015	79,489	75,202	102,850	140,300	27,648
2016	64,087	71,925	98,600	116,700	26,675
2017	48,734	64,442	88,342	105,378	23,900
2018	15,247	13,096	18,000	23,565	4,904
2019	15,411	12,368	17,000	23,669	4,632
2020	6,233	6,431	14,621	17,794	2,537
*2021	16,502	17,321	23,627	28,977	5,864

*As of 10/04/2021

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-conformances	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 FOFL, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the MSST. This is considered to be one half of B35% (i.e., B17.5%) for the Pacific cod stocks. 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 Pacific cod stocks are made annually by the Council and include the OFL, ABC, and TAC. Links to these documents from the December Council meeting, with harvest specifications adopted for 2022 and 2022, are as follows: https://meetings.npfmc.org/CommentReview/DownloadFile?p=d07f1a4e-e9c9-4041-bedb-

fba6ed995d92.pdf&fileName=C4%20Council%20Motion.pdf.

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). GOA and EBS Pacific cod are 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 of Pacific cod 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." For GOA Pacific cod, analyses from the 2018 SAFE (Barbeaux et al. 2018) show a 20.7% probability of the SSB being below B20% and a 1.1% probability of being below B17.5% at the start of 2019.

In 2019, the GOA Pacific cod stock continued to be at a low biomass level. According to the 2019 update of the Pacific cod stock assessment, the SSB is projected to reach an all-time low in 2020, just above the OFL of B17.5%. As the stock is below the B20% threshold, federal regulations at CFR 679.20 require the directed fishery for Pacific cod to be closed for 2020-2021 due to Steller sea lion conservation measures. The 2020 GOA Pacific cod TAC is for incidental catch in other fisheries and accounts for the state GHL. The GOA Pacific cod stock remains at low levels but is increasing and is estimated to be above the overfished determination level. SSB is projected to increase from 2021 to 2022 due to a stronger 2018 recruitment and reduction in F since 2018. The 2021 federal GOA Pacific cod TAC is 17,321 mt, which reserves an additional 6,306 mt for the State GHL. The SSC requested the authors compare results using different assumptions about natural mortality and recruitment due to the considerable uncertainty about future recruitment and potential effects of the impending marine heat wave on cod mortality. For these reasons, the SSC set the 2021 ABC to be the same as the 2020 ABC until next year's assessment provides more clarity about future trends. The sum of the ABCs for all GOA groundfish stocks in 2021 is 476,037 mt, which is a 2.2% increase compared to the 2020 (465,956 mt) aggregate ABC. Maximum ABCs were set for all stocks in the GOA in 2020, except for sablefish, dusky rockfish, and the demersal shelf rockfish complex. An ABC less than the maximum permissible is recommended when there are additional conservation considerations that are not accounted for in the stock assessment, tier system, or HCRs.

The 2021 SAFE report (Fissel et al. 2021) clearly indicates that the stock remains at low levels with poor recruitment since 2014. Although the 2017 and 2018 beach seine survey indicated higher densities of age-0 cod in those years, these fish failed to materialize at higher abundance in the 2019 - 2021 surveys or fisheries. Given selectivity in the fisheries and surveys, the high density of age-0 cod in the 2020 beach seine survey would not yet be collaborated by other data. Despite recent low recruitment, the stock was projected to either increase slowly (Projection A) or remain relatively stable (Projection B) due to low fishing levels in 2020 and 2021. Both projections have the stock at B24.5% in 2022, however they differ in 2023 with Projections A at B23.8% and Projection B at B21.6% (Figure 6, Fissel et al. 2021).

The GOA Groundfish Plan Team and the Council's SSC will continue to explore use of the species-specific risk tables for appropriate reductions from maxABC in future harvest specification exercises. 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, including some on Pacific cod. Research is also conducted by ADFG on the state-managed Pacific cod. There are pre-agreed Council HCRs in place to ensure overfishing does not occur on the Pacific cod 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."

In June 2018, the Council initiated an analysis of alternatives to modify the existing four-season structure of the Western and Central GOA pollock fishery and the relative allocation of the trawl catcher vessel sector's annual Pacific cod TAC across A and B seasons (https://www.npfmc.org/goaseasonallocations/). Given the many existing challenges in managing and prosecuting these limited access trawl fisheries, the Council is seeking small changes that improve fishery outcomes without causing unintended redistribution of fishing opportunities across management areas or gear sectors. The Council recognized that the existing seasonal allocations were implemented as Steller sea lion protection measures, and that modification requires analysis of potential effects on Steller sea lions and consultation with NMFS Protected Resources division once a preferred action has been recommended.

Clause 7.2 is not applicable, as fisheries for Pacific cod in Alaska are well established. 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-conformances	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 Pacific cod fisheries in Alaska. 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 Pacific cod 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 Pacific cod fisheries. The state Pacific cod fisheries are managed by ADFG and BOF using an annual GHL set as a percentage of the federal ABC for GOA Pacific cod, and regulations are spelled out by BOF. Extensive cooperation exists between federal and state authorities in assessing and managing the Pacific cod stocks. Using the AI stock as an example, during the period in which a state fishery has existed: 1) TAC has been reduced so that the sum of the TAC and GHL would not exceed the ABC, 2) catch in the Federal fishery has been kept below TAC, and 3) total catch (federal plus state) has been kept below ABC.

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 - 2.0 million metric tons while the range for GOA is 116,000 – 800,000 metric 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, including Pacific cod (Fissel et al. 2021) 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 and can be found at: Council TAC, OFL and ABC recommendations.

As listed in the FMPs and in NMFS regulations, the only legal gears for taking Pacific cod in the Alaska fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. Regulations pertaining to vessel and gear markings in the Pacific cod fishery are established in NMFS regulations as prescribed in the annual management measures published in the Federal Register and the ADFG Statewide Commercial Groundfish Regulations. 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 the Pacific cod 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 is known of the effects of derelict trawls and longlines.

The Council and BOF have extensive processes in place to allow for identifying and consulting with domestic parties having interest in the Alaska Pacific cod fisheries. The Council is responsible for allocation of the Pacific cod 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 Pacific cod 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 Pacific cod 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. While meetings have been web-based since early 2020, owing to the pandemic, they have continued as scheduled. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. Fishing industry stakeholders work extensively with fishery scientists, managers, and other industry members on various initiatives to ensure sustainability of the Pacific cod 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 Pacific cod resource in Alaska. These include harvest control rules, 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 Pacific cod 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 Amendment 80 program was implemented in 2008 for certain groundfish catcher/processors in the BSAI and provides an allocation of six groundfish species including Pacific cod. As well, the freezer longline fleet in the BSAI Region formed a voluntary cooperative (the Freezer Longline Conservation Cooperative) in 2010, in an attempt to maximize the value of their allocation of Pacific cod. The number of active vessels in this fleet was stable between 2003 and 2009 at an average of approximately 39 vessels, but after the formation of the Freezer Longline Conservation Cooperative, only approximately 29-30 vessels continued to fish in 2011-2014. However, the number of fishing days utilized increased, as the race for fish was eliminated (Fissel et al. 2021). Amendment 83 to the GOA FMP allocates the Pacific cod TAC in the Western and Central regulatory areas of the GOA among various gear and operational sectors and eliminates inshore and offshore allocations in these two regulatory areas. The Council regularly reviews the effectiveness of measures such as Amendment 80, and a detailed five-year review was prepared for the Council in 2014.

There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the Pacific cod fisheries, and to ensure that the resources are harvested sustainably. These include various measures to address fish size, discards, and closed seasons and areas. Specific examples include development of excluder devices for trawl gear to reduce these by-catches, and closures of large areas to protect numerous endangered species (including salmon, crab, and marine mammals). Since 1998, full retention of Pacific cod is required in all Alaska fisheries under the Improved Retention/Improved Utilization Program. In addition, some vessels have made various gear modifications to avoid retention of smaller fish, and/or to minimize bottom contact. MRAs are put in place to help manage bycatches in groundfish fisheries. Fishing industry groups such as cooperatives and coalitions have undertaken numerous conservation-oriented measures in relation to fish size, bycatch avoidance, and product utilization.

NMFS has a full suite of fishery regulations for Alaska waters which cover all aspects of fishing, including seasons, gear limitations, and numerous area closures. There are specific rules laid out for Pacific cod, permitting the use of trawl gear in certain areas only, as well as regulations on seabird avoidance for vessels fishing with hook-and-line gear. The gear regulations also contain details on mesh sizes permitted, biodegradable panels in pot gears, types of hook and line gear allowed, etc. The use of bottom contact gear is prohibited in the Gulf of Alaska Coral and Alaska Seamount Habitat Protection Areas year-round. Fishing with trawl vessels is not permitted year-round in the Crab and Halibut Protection Zone and the Pribilof Island Habitat Conservation Area. As well, a number of closure zones for trawl gears are described in the 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.”.

In 2020, the SSB in the GOA was projected to have dropped below B20% and the federal Pacific cod fishery in the GOA was closed by regulation to directed Pacific cod fishing. The Alaska State directed Pacific cod fishery remained open and Pacific cod bycatch in other federally managed groundfish fisheries was allowed. The Pacific cod ABC for 2020 was set to 14,621 t, but the combined TAC and Alaska State GHL was reduced to account for additional uncertainty. The Alaska State managed fisheries are allocated 26.7% of the GOA Pacific cod ABC. The federal Pacific cod TAC was reduced by 40% from the maximum of 10,719 t as a further level of precaution to 6,431 t. ADFG also reduced their maximum prescribed harvest limit of 3,902 t by 35% to 2,537 t. This resulted in a total combined federal TAC and Alaska State GHL of 8,968 t or 61% of the maximum ABC. In 2020, a total combined catch of 6,233 t was harvested (Table 2.2, Barbeaux et al. 2021), the state having taken 2,318 t (91% of the GHL) and federal fisheries having taken 3,916 t (61% of the federal TAC). The catch in the federal fisheries were split primarily between the arrowtooth flounder (1,237 t), walleye pollock (1,040 t), and shallow water flatfish fisheries (938 t).

In 2021, the stock was projected to be above B20% and the federal fishery was once again allowed to open. The federal TAC was set at 17,321 t and state GHL set at 5,864 t (Table 2.3, Barbeaux et al. 2021). As of October 4, 2021, a total of 16,502 t (69% of the ABC) had been harvested (Table 2.2, Barbeaux et al. 2021). State fisheries had harvested 5,573 t (95% of the GHL) and federal fisheries 10,930 t (63% of the TAC). In 2021 43% of the Pacific cod catch was by pot gear (Table 2.2, Barbeaux et al. 2021), 32% by trawl, and 8% by longline, while jig and other gear harvested less than 7%.

As reported in Alaska Fisheries Science Center and Alaska Regional Office (2021), the program was impacted by the pandemic. Starting in March 2020 limitations on available air travel and restrictions in many remote Alaska communities required the program to adapt which included bringing in waivers for the need for at-sea observes and shore based catch monitors if one of 2 of the following criteria were met: 1. Observers or at-sea monitors are not available for deployment; 2. The observer providers cannot meet the safety protocols imposed by a state on commercial fishing crew or by the vessels owners. The largest component of the Alaska groundfish fisheries, vessels, and processors in the full coverage category (including catcher processors and participants in limited access privilege programs), were not issued waivers in 2020. Additionally, requirements for deployment of EM were not waived for trawl catcher vessels fishing under the trawl EM exempted fishing permit. As result at-sea observer coverage was and continues to be largely maintained.

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 such as Pacific cod. 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 Pacific cod stocks in Alaska are classified as overfished or undergoing overfishing and no destructive fishing practices are allowed in GOA or BSAI which would adversely impact habitat. With regard to other resources taken in the Pacific cod 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 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, and some are specific to the Pacific cod fisheries. 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 catcher/processors and Non-Rockfish Program catcher vessel sectors and established seasonal Chinook salmon PSC limits for the trawl catcher/processor sector. The majority of chinook by- catch 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.

FMPs outline the allowable fishing gears allowed in the Alaska Pacific cod fisheries, (no gillnetting is permitted). Evidence provided by fishing fleets indicates that lost fishing gear is minimal. Use of longline gear in the Pacific cod fisheries substantially reduces the impact on bottom habitats and bycatch of many bottom dwelling species. Longline is typically not associated with as much ghost fishing as some other fishing gears, such as gillnets and some types of traps (NOAA 2015a). There are no formal estimates of lost pot gear in the Pacific cod fishery; however, it has been reported that in some locations there were periodic lost pot recovery programs. NMFS regulations require that each pot be equipped with a biodegradable panel and escape rings to reduce the ability of lost pots to ghost-fish. Advancements or developments in fishing gear are made widely available to fishers through websites of the Council, NOAA/NMFS, and ADFG, and public meetings and other forms of communication. Use of excluder devices is generally thought not to negatively impact the selectivity of the trawls toward Pacific cod and are designed not to impede escaping fish.

The fishery for Pacific cod in Alaska is conducted by U.S. vessels only. In adjacent waters of the GOA cooperation on Pacific cod 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 Technical Subcommittee 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 Technical Subcommittee 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-conformances	None

Evidence of continuous compliance with the fundamental clause:

The North Pacific 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 Pacific cod fisheries, including those dealing with responsible fishing methods, are readily available on NMFS, 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 QSs, IFQs, 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, such as Fissel et al. (2021). 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 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-conformances	None

Evidence of continuous compliance with the fundamental clause:

The USCG, OLE, and AWT conduct at-sea and shore-based inspections. At-sea, dockside monitoring, aerial surveillance, and satellite VMS are in operation within the fisheries and developmental of EM 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 fulfils the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

The Observer Program is the main data gathering program for all biological and fishery data for Pacific cod 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.

As reported in Alaska Fisheries Science Center and Alaska Regional Office (2021), the program was impacted by the pandemic. Starting in March 2020 limitations on available air travel and restrictions in many remote Alaska communities required the program to adapt which included bringing in waivers for the need for at-sea observes and shore based catch monitors if one of 2 of the following criteria were met: 1. Observers or at-sea monitors are not available for deployment; 2. The observer providers cannot meet the safety protocols imposed by a state on commercial fishing crew or by the vessel's owners. The largest component of the Alaska groundfish fisheries, vessels, and processors in the full coverage category (including catcher processors and participants in limited access privilege programs), were not issued waivers in 2020. Additionally, requirements for deployment of EM were not waived for trawl catcher vessels fishing under the trawl EM exempted fishing permit. As result at-sea observer coverage was largely maintained in 2020 and continued to be maintained in 2021.

The Alaska Commercial Fisheries Entry Commission helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers. The Commission 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 Pacific cod fishery is considered to be a relatively low risk fishery, with the potential for PSC bycatch, in particular halibut and salmon, at certain times of the year being the main issue. The low occurrence of serious offences indicates that the Pacific cod fishery is generally very compliant with regulations and the sanctions are considered to be an effective deterrent.

None of the documentation in the following reports and minutes appear to relate to compliance issues for any directed Pacific cod fishing vessel or activities.

March 2021 Enforcement Committee Minutes:
https://meetings.npfmc.org/CommentReview/DownloadFile?p=17abbf23-b86a-46a6-9c89-bdc37ce3cfd9.pdf&fileName=D3%20Enforcement%20Committee%20Minutes.pdf

June 2021 OLE Enforcement Report to the Council:
https://meetings.npfmc.org/CommentReview/DownloadFile?p=ca983f30-9a78-405e-9bf8-a4d552853f15.pdf&fileName=B4%20OLE%20Report.pdf

June 2021 USCG Enforcement Report to the Council:
https://meetings.npfmc.org/CommentReview/DownloadFile?p=1fab60d4-c0ea-495f-ae63-5d77ff30d24c.pdf&fileName=B7%20USCG%20D17%20Report.pdf

December 2021 OLE Enforcement Report to the Council:
https://meetings.npfmc.org/CommentReview/DownloadFile?p=188b9834-6bd4-4281-b950-37581d7f6580.pdf&fileName=B4%202021%20December%20OLE%20Report.pdf

December 2021 USCG Enforcement Report to the Council:
https://meetings.npfmc.org/CommentReview/DownloadFile?p=43d5d53b-a720-4d32-a660-3ecbe06b19db.pdf&fileName=B6%20USGC%20Report.pdf

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-conformances	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 PWS Pollock fishery 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 1 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.

In 2020/21, due to Covid-19, there were reduced enforcement efforts, reduced numbers of observer reports of potential violations and the court cases/citations that have been issued/settled through the office of general counsel do not appear to include any directed Pacific cod fishing vessels or activities for the recent year.

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.

11.1 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-conformances	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; therefore, evidence of compliance is 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 cod SAFE report (including evaluation of ecosystem considerations) and the specific GOA Ecosystem Status Report (Barbeaux et al. 2021; Ferriss and Zador 2021). An updated evaluation of the economic status of the groundfish fisheries off Alaska also occurred (Fissel et al. 2021). 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 NMFS. After a scaling back in 2020 due to Covid-19, industry worked closely with the Program to maintain data collection, and in 2021, observer coverage remained high (Alaska Fisheries Science Center and Alaska Regional Office 2021). The fishery did not catch any Pacific cod in the GOA in 2020 due to a fishery closure so non-target catch numbers are also much less than previous years. The catches of retained FMP species (e.g., pollock, arrowtooth flounder, flathead sole, rock sole, yellowfin sole) were similar to previous years. Most catches, including retained, prohibited, and non-target species, were broadly similar in composition to that previously observed. With regard to species with PSC limits, in most cases, there was a decrease in catch from 2019 to 2021. However, there was an increase in Chinook salmon. Given that this is only a one-year increase and they do not appear to be overfished, the confidence rating will remain the same, but this will be reviewed at the next surveillance.

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 Pacific cod fishery continues to be listed as Category III (remote likelihood or no known interaction with marine mammals) fishery. The latest Alaska marine mammal stock assessment report updated the stock status and provided new estimates of potential biological removals for several species (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). It also summarized the incidental mortality and injury due to commercial fisheries using the latest available data. The one relevant species listed on the ESA list is 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 mortality, which occurred via trawl gear in 2016 (Delean et al. 2020). Due to the fishery's closure in 2020, there were no marine mammal interactions. There has been a sustained increase in the Steller sea lion population size in all areas of the GOA since 2003, and from 2018 to 2019, it appears that the population has stabilized.

Seabirds
Interactions with fishing gear are recorded through the NMFS Observer Program (summarized in Krieger and Eich 2021), and population trends are monitored by the USFWS (summarized in Dragoo et al. 2019). In past years, the longline fishery interacted with northern fulmar, black-footed albatross, and gulls and the pot fishery with northern fulmar. The one relevant species on the ESA list is the short-tailed albatross, and none have been taken recently in the GOA Pacific cod fishery.

Salmon
The bycatch of ESA-listed Chinook salmon by the GOA pollock fishery increased in 2019 but decreased again in 2020 and 2021, and the amounts have been within the fishery's limit of 32,500 Chinook salmon (combined limit for the Central and Western GOA trawl sectors). Data continue to be collected, and the bycatch numbers are analyzed annually (NMFS 2021, 2022).

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's food web is driven by climate and corresponding circulation and water temperature changes. "Much of 2021 has been cooler than the previous few years, with temperatures in both the western and eastern GOA often hovering close to the long-term average" (Ferriss and Zador 2021). 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 2021).

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 (Simpson et al. 2017). The average percentage impact by the Pacific cod fishery for 2003-2016 was 1.8% of the Pacific cod EFH in the GOA (https://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/). The final environmental assessment (for EFH Omnibus Amendments was published in June 2018 (https://alaskafisheries.noaa.gov/sites/default/files/analyses/efh-omnibus-amendments-ea0618.pdf). 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 has begun (https://meetings.npfmc.org/Meeting/Details/2733) so outputs from this review will be considered at the next surveillance audit.

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 Pacific cod SAFE reports (including evaluation of ecosystem considerations) and Ecosystem Status Reports, specifically for the EBS (Thompson et al. 2021, Siddon 2021) and the AI (Spies et al. 2021, Ortiz and Zador 2021). An updated evaluation of the economic status of the groundfish

fisheries off Alaska also occurred (Fissel et al. 2021). 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 NMFS. After a scaling back in 2020 due to Covid-19, industry worked closely with the Program to maintain data collection, and in 2021, observer coverage remained high (Alaska Fisheries Science Center and Alaska Regional Office 2021). The catches of retained FMP species (e.g., pollock, arrowtooth flounder, flathead sole, rock sole, yellowfin sole) were similar to previous years. Most catches, including retained, prohibited, and non-target species, were broadly similar in composition to that previously observed. With regard to species with PSC limits, in most cases, there was a decrease in catch from 2019 to 2020. However, there was an increase in opilio tanner crab in the BSAI. Given that this is only a one-year increase and they do not appear to be overfished, the confidence rating will remain the same, but this will be reviewed at the next surveillance.

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 Pacific cod pot fishery is classified as Category II (occasional interactions) and the trawl and longline fisheries 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 for several species (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). It also summarized the incidental mortality and injury due to commercial fisheries using the latest available data. The three relevant species listed on the ESA list are:
- Steller sea lion (western U.S. stock) – longline and trawl fisheries
- Humpback whale (western North Pacific distinct population segment [DPS]) – pot fishery
- Bearded seal (Beringia DPS) – trawl fishery

According to observer data, in recent years (2013-2017), the longline fishery caused six Steller sea lion mortalities, and the trawl fishery caused two mortalities (Delean et al. 2020). The BSAI Pacific cod trawl fishery caused one bearded seal mortality during this period, and the pot fishery caused one serious injury (Delean et al. 2020; Muto et al. 2020). Overall, these species' populations appear to be stable or increasing.

Seabirds
Interactions with fishing gear are recorded through the NMFS Observer Program (summarized in Krieger and Eich 2021), and population trends are monitored by the USFWS (summarized in Dragoo et al. 2019). The longline component of the Pacific cod fishery accounts for most of the seabirds taken in the BSAI, interacting with northern fulmar, short-tailed albatross, Laysan albatross, shearwaters, kittiwakes, murres, puffins, auklets, and gulls in recent years (2010-2020). The trawl fishery interacted with northern fulmar and the pot fishery with northern fulmar, murres, and auklets (Krieger and Eich 2021). Generally, seabird bycatch in the BSAI Pacific cod fisheries has declined since 2002 and the introduction of seabird mitigation devices. The one relevant species on the ESA list is the short-tailed albatross, and 11 were taken in 2020. However, none were taken 2015-2019 (Krieger and Eich 2021). Overall, the confidence rating will remain the same, but this will be reviewed in more detail as part of the concurrent second reassessment.

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 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 2021, Ortiz and Zador 2021).

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). It is estimated that 4.9% of Pacific cod EFH in the BS is impacted by the Pacific cod fishery and that 1.9% of Pacific cod EFH in the AI is impacted by the Pacific cod fishery (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 (https://alaskafisheries.noaa.gov/sites/default/files/analyses/efh-omnibus-amendments-ea0618.pdf). 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 has begun (https://meetings.npfmc.org/Meeting/Details/2733) so outputs from this review will be considered at the next surveillance audit.

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 – NOT APPLICABLE

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-conformances	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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8 APPENDICIES

Appendix 1 Stakeholder submissions

Other than the client's annual update and information gathered from stakeholders during the various meetings, no stakeholder comments were received during the annual surveillance activities.

Appendix 2 Non-conformance action plan

1	Non-conformance number
	1
2	Fundamental Clause
	Fundamental Clause 3, Supporting Clause 3.1
3	Score
	Medium non-conformance
4	Non-conformance
	At the last assessment of the fishery (2017), it was concluded that both the federal and state components of the management systems met the requirements of supporting clause 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.” At this 4th annual audit of the fishery, the re-assessment of the fishery against version 2.1 of the RFM standard also commenced. In the course of discussions associated with the re-assessment with regard to supporting clause 3.1, it became clear that the state component of the management system did not meet the requirements of the clause. This came to light when information showed that 5 ACC 28.089 [Guiding principles for groundfish fishery regulations, 1996] that was introduced and applied to Alaska Department of Fish and Game’s (ADFG’s) initial groundfish management plans had been repealed in March 2013 and, in so doing, removed the only piece of ADFG documentation that explicitly sets out “long term management objectives in a plan or other management document (taking into account uncertainty and imprecision) and be subscribed to by all interested parties” in relation to the state managed Pacific cod fisheries. As a result, a minor non-conformance was raised.
5	Milestone(s)
	By December 2027 (the end of the next five-year certification cycle), short and long-term objectives need to be explicit within the State’s fishery specific management system.

6	Summary of action plan
	By December 2027, the fishery will demonstrate a plan to ensure short- and long-term fishery objectives are in place for Pacific cod in State of Alaska waters. AFDF has already worked with ADFG and stakeholders to develop and submit a Board of Fisheries (BOF) proposal for inclusion of explicit fishery objectives. This proposal will be addressed by the BOF at its scheduled meeting for the cod fishery in October 2022. Until the condition is met, at the time of each annual audit, AFDF will submit to the AT a progress report specifically describing progress toward satisfying this minor non-conformance.

Milestone	Action	Roles & Responsibilities	Outputs
December 2022	AFDF has already worked with ADFG and stakeholders to develop and submit a Board of Fisheries (BOF) proposal (attached) for inclusion of explicit fishery objectives. This proposal will be addressed by the BOF at its scheduled meeting for the cod fishery in October 2022.	Key lead: Julie Decker, AFDF. Other entities involved: Alaska Department of Fish and Game, Alaska Board of Fisheries.	At the time of each annual audit, AFDF will submit to the AT a progress report specifically describing progress toward satisfying this minor non-conformance.
December 2027	The Alaska cod fishery will demonstrate a plan to ensure short- and long-term fishery objectives are in place for Pacific cod in State of Alaska waters.	Key lead: Julie Decker, AFDF. Other entities involved: Alaska Department of Fish and Game, Alaska Board of Fisheries.	At the time of each annual audit, AFDF will submit to the AT a progress report specifically describing progress toward satisfying this minor non-conformance.

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