DNV

WHEN TRUST MATTERS

CERTIFICATION REPORT

RESPONSIBLE FISHERIES MANAGEMENT CERTIFICATION SCHEME, VERSION 2.1

REASSESSMENT OF THE ALASKA PACIFIC COD FISHERY

Certification Body	DNV Business Assurance USA
Assessment Team	Jodi Bostrom, Giuseppe Scarcella, Paul Knapman
Fishery Client	Alaska Fisheries Development Foundation
Assessment Type	Second Reassessment
Date	2/4/2023

Certified Sustainable ALASKA RFM

Table of contents

GLOSSARY

Abbreviations & acronyms

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AI	Aleutian Islands
ASMI	Alaska Seafood Marketing Institute
AP	Advisory Panel
AWT	Alaska Wildlife Troopers
B	Biomass
BOF	Board of Fisheries
BSAI	Bering Sea and Aleutian Islands
CAS	Catch accounting system
CCRF	Code of Conduct for Responsible Fisheries
CDQ	Community Development Quota
CEA	Core EFH area
CEC	Community Engagement Committee
CIE	Center for Independent Experts
CITES	Convention on International Trade in Endangered Species
C/P	Catcher/processor
CPUE	Catch per unit effort
CSC	Certified Seafood Cooperative
CV	Catcher vessel
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
HAPC	Habitat area of particular concern
HCR	Harvest control rule
IUCN	International Union for the Conservation of Nature
IUU	Illegal, unreported, unregulated (fishing)
LLP	License Limitation Program
MCS	Monitoring, control, and surveillance
MMPA	Marine Mammal Protection Act
MRA	Maximum retainable allowances
MSA	Magnuson-Stevens Fisheries Management and Conservation Act
MSST	Minimum stock size threshold
MSY	Maximum sustainable yield
mt	Metric tons
NC	Non-conformance
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS (NOAA Fisheries)	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
PBR	Potential biological removal
PSC	Prohibited species catch
PSEIS	Programmatic Supplemental Environmental Impact Statement
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation (Report)
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TSC	Technical Subcommittee
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service

1 SUMMARY AND THE UNIT OF THE CERTIFICATION

The purpose of this report is a second re-assessment of the Alaska Pacific cod fishery against the Responsible Fisheries Management (RFM) standard v2.1. This report contains the findings of the RFM Fisheries re-assessment audit conducted for the Alaska Pacific cod fishery on January 18-21, 2022.

The RFM Certification Program is a voluntary program that is owned and managed by the Certified Seafood Collaborative (CSC) to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed according to the RFM standard. Additionally, application to the RFM is only available for fisheries operating within the North American fisheries operating in the U.S. and Canadian 200 nm exclusive economic zone (EEZ).

The RFM Certification Program uses the fundamental clauses of the RFM Fisheries Standard Version 2.1 and is in accordance with ISO 17065 accredited certification procedures. The assessment is based on the fundamental clauses specified in the RFM Fisheries Standard Version 2.1. It is based on four key components of responsible management derived from the Food and Agriculture Organization of the United Nations (FAO) Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labeling of products from marine capture fisheries (2009).

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

Table 1. General information and the fishery being assessed

Fishery name	Alaska Pacific Cod Fishery		
Fishery being assessed	**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, 2011; recertified December 6, 2017	Date of certificate expiry	December 5, 2017 and then December 5, 2022, following first recertification (See Section 1.1 for details on a certificate extension.) *Note: Due to extenuating circumstances, DNV requested a two-month extension so the current certificate expires on February 5, 2023.*
Audit type	Second re-assessment		
Date of audit	January 18-21, 2022		
Assessment team	Lead assessor: Jodi Bostrom Assessor(s): Giuseppe Scarcella, Paul Knapman		

1.1 Assessment timeline

Table 2 provides an estimated timeline for the assessment. Due to extenuating circumstances, DNV requested a certificate extension. The certificate now expires on February 5, 2023; this is the date of recertification.

Table 2. Assessment timeline

Event	Date
Announcement of second re-assessment:	December 14, 2021
Site visit and stakeholder consultations:	January 18-21, 2022
Expected date of recertification:	February 5, 2023

1.2 A summary of the conformance of the fishery to the RFM Fisheries Standard

Table 3. Summary of the conformance of the fishery to the RFM Fishery Standard

Fundamental Clause	Evidence adequacy rating	Justification
A. The Fisheries Management System		
1. There shall be a structured and legally mandated management system based upon andrespecting international, national, and local fishery laws, for the responsible utilization of the target stock and conservation of the marine environment.	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; NOAA Fisheries) 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. 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, integrated, resource use and conflict avoidance.	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. The CDQ program allocates a percentage of the BSAI quotas to CDQ groups, including cod.
3. Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.	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 long-term objectives within any ADFG plan or any other management document with regard to state-managed Pacific cod fisheries.
B. Science, Stock Assessment Activities, and the Precautionary Approach		
4. There shall be an effective fishery data (dependent and independent) collection and analysis system for stock management purposes.	High	Reliable and accurate data required for assessing the status of fisheries and ecosystems - including data on retained catch of fish, bycatch, discards and waste are collected (BSAI and GOA surveys, catch data, observer data). The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess Pacific cod fisheries and ecosystems in GOA and BSAI areas. GOA and BSAI Stock Assessment and Fishery Evaluation (SAFE) reports provide complete descriptions of data types and years collected.
5. To support its optimum utilization, there shall be regular stock assessment activities appropriate for the fishery resource—its range, the species biology, and the ecosystem—all undertaken in accordance with acknowledged scientific standards.	High	In Alaska, appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture, and nutritional science (e.g., NMFS, ADFG). The research is disseminated accordingly. Alaska also ensures the availability of research facilities and provides appropriate training, staffing and institution building to conduct the research.

6. The current state of the stock shall be defined in relation to reference points, relevant proxies, or verifiable substitutes, allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference points or other suitable proxies areapproached or exceeded.	High	The Eastern Bering Sea (EBS), Aleutian Islands (AI), and GOA groundfish management plans define target and limit reference points and harvest control rules (HCRs) for Pacific cod and other groundfish. Each SAFE report describes the current fishing mortality rate (F), and stock biomass relative to the reference points.
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.	High	When new uncertainties arise, research recommendations are made and there is accountability in subsequent years to follow up on related action items. However, these uncertainties do not lead to a postponement for providing advice; in all cases precaution is the rule.
C. Management Measures, Implementation, Monitoring, and Control		
8. Management shall adopt and implement effective management measures designed tomaintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable use of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources.	High	The MSA is the federal legislation that defines how fisheries off the U.S. 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., optimum yield [OY], TAC, ABC, overfishing level [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. Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards, guidelines, and regulations.	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. An effective legal and administrative framework shall be established and compliance ensured through effective mechanisms for monitoring, surveillance, control, and	High	The Alaska Pacific cod fishery uses enforcement measures including vessel monitoring systems on board vessels, USCG boardings and inspection activities. The USCG

enforcement for all fishing activities within the jurisdiction.		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 the case to NOAA's Office of General Counsel for Enforcement and Litigation. State regulations are enforced by AWT.
11. There shall be a framework for sanctions of adequate severity to support compliance and discourage violations and illegal activities.	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.
D. Serious Impacts of the Fishery on the Ecosystem		
12. Considerations of fishery interactions and their effects on the ecosystem shall be based on best available science, local knowledge where it can be objectively verified, and a risk-based management approach to determine the most probable adverse impacts. Adverse impacts on the fishery on the	High	The Council, NOAA Fisheries, 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

ecosystem shall be appropriately assessed and effectively addressed.		– 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. Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.	NA	Not an enhanced fishery.

1.3 Non-conformances raised and corrective action plans

One minor non-conformance (NC) was raised on supporting clause 3.1 during the re-assessment of the Alaska Pacific cod fishery. The corrective action plan from the client is provided in Section 6.

1.4 Recommendation for certification of the assessment team

Table 4. Certification recommendation

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, undergoing reassessment**	Following the results of the reassessment audit conducted in January 18-21, 2022 and the reassessment process, the assessment team recommends the recertification of this fishery according to the RFM Fisheries Standard v2.1.

2 ASSESSMENT TEAM AND PEER REVIEWER DETAILS

2.1 Assessment team

Jodi Bostrom DNV Lead Assessor and main area of responsibility Fundamental clause D (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 (Fisheries Management System) and C (Science, Stock Assessment Activities, and the Precautionary Approach)	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 area of responsibility Fundamental clause B (Science, Stock Assessment Activities, and 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.

2.2 Peer reviewers

Wes Toller	Dr. Wes Toller has been an independent consultant in standard setting, sustainability and eco-certification since 2010. His current work includes developing standards, methodologies, guidelines and assessment tools for use in improving sustainability and accountability in the seafood and other natural resources sectors. He has worked closely with leading certification schemes including the Marine Stewardship Council (MSC) and Aquaculture Stewardship Council (ASC) to develop and improve processes for auditing and accreditation of sustainability standards. Wes was previously a program manager with Accreditation Services International (ASI) where he helped establish the company's MSC Program. He has an in-depth knowledge of ISO requirements and international best practices relating to eco-certification. Wes sees his move into the sustainability sector as a natural progression from his background in fisheries management and habitat conservation. Wes received his doctorate in biological sciences from the University of Southern California. He has also reviewed several RFM reports.
Jim Andrews	Dr. Jim Andrews has over 25 years' experience working in marine fisheries and environmental management. His previous experience includes running the North Western and North Wales Sea Fisheries Committee as its Chief Executive from 2001 to 2005, and previously working as the SFC's Marine Environment Liaison Officer. During this time, he was responsible for the regulation, management and assessment of inshore finfish and shellfish stocks along a 1,500km coastline. He has an extensive practical knowledge of both fisheries and environmental management and enforcement under UK and EC legislation. Jim has formal legal training &

qualifications, with a special interest in the policy, governance and management of fisheries impacts on marine ecosystems. He has worked as an assessor and lead assessor on more than 25 MSC certifications within the UK, Europe, Africa, Australia, South America and Asia since 2007. In 2008 he worked with the MSC and WWF on one of the pilot assessments using the MSC Risk Based Assessment Framework (RBF) and is fully trained in the use of the RBF. He has carried out many peer reviews of MSC assessments and is a member of the MSC Peer Review College. He has also reviewed several RFM reports.

3 BACKGROUND OF THE FISHERY BEING ASSESSED

3.1 General historical background information on the area of the fishery

Pacific cod (*Gadus macrocephalus*) is a transoceanic species, occurring at depths from shoreline to about 500 m. The southern limit of the species' distribution is about 34° N latitude, with a northern limit of about 65° N latitude. Pacific cod is distributed widely over the EBS as well as in the AI and GOA areas (Figure 1). Tagging studies have demonstrated significant migration both within and between the EBS, AI, and GOA (Thompson and Palsson 2016). However, other research indicated the existence of discrete stocks in the EBS and AI (Spies 2012). Although the resource in the combined EBS and AI (BSAI) region had been managed as a single unit from 1977, separate harvest specifications have been set for the two areas since the 2014 season. The resource in GOA is managed as a single stock.

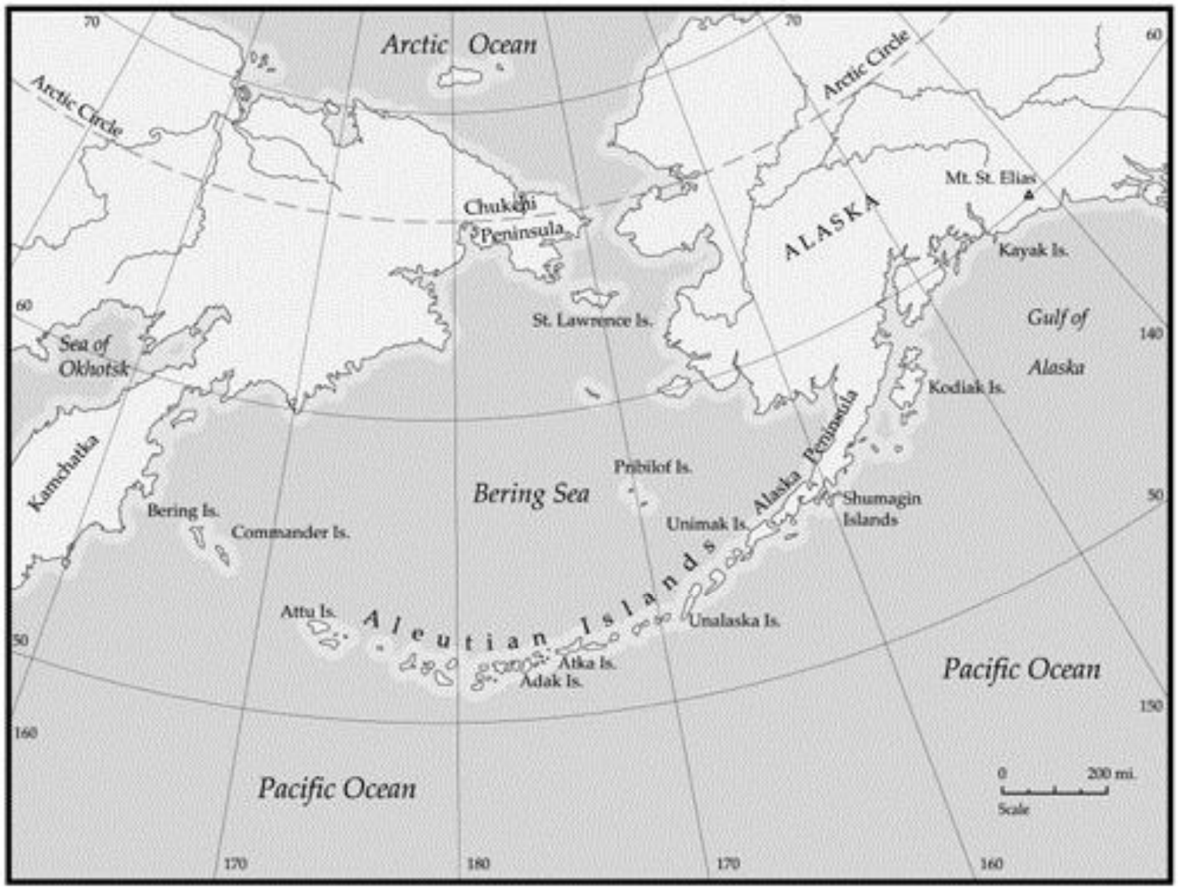

Figure 1. Map showing Bering Sea, Gulf of Alaska, and Aleutian Islands. Source: http://www.common-place-archives.org/vol-05/no-02/namias/index.shtml

Bryan et al. (2021) conducted a tagging study on this species in Alaska waters. The study provided important initial insights into the seasonal movement patterns of Pacific cod in the AI. Most tracked Pacific cod (77%) undertook migrations in the middle of March (64-394 km) from their winter spawning areas to summer foraging areas, but a few individuals remained in their capture location suggesting a partial migration strategy. Their ability to cross deep passes that were previously seen as potential barriers to movement has expanded the understanding of population connectivity.

Adult Pacific cod occur in depths from the shoreline to 500 m, although the SAFE authors report that occurrence in depths greater than 300 m is rare in EBS and GOA. Preferred substrate is soft sediment (i.e., mud, clay, and sand). Pacific cod are known to undertake seasonal migrations, the timing and duration of which may be variable. For the BSAI Region, Neidetcher et al. (2014) have identified spawning locations north of Unimak Island, near the Pribilof Islands, at the shelf break near Zhemchug Canyon, and adjacent to central and western Aleutian Islands along the continental shelf. The Alaska Pacific cod fisheries operate within the Alaska EEZ only and include state-managed waters within 3 nautical miles (nm) of shoreline. In the EBS, Pacific cod are caught throughout much of the continental shelf. Historically, Pacific cod were caught throughout the AI, with catch distribution since 2011 affected by enactment of Steller sea lion protective regulations in 2011. Since then, most of the catch has come from the Eastern AI area (Figure 2). Historically, the majority of the GOA catch has come from the Central regulatory area (Figure 2). A substantial fishery for Pacific cod has also been conducted in State of Alaska waters, mostly in the Western and Central Regulatory Areas of GOA (Figure 3).

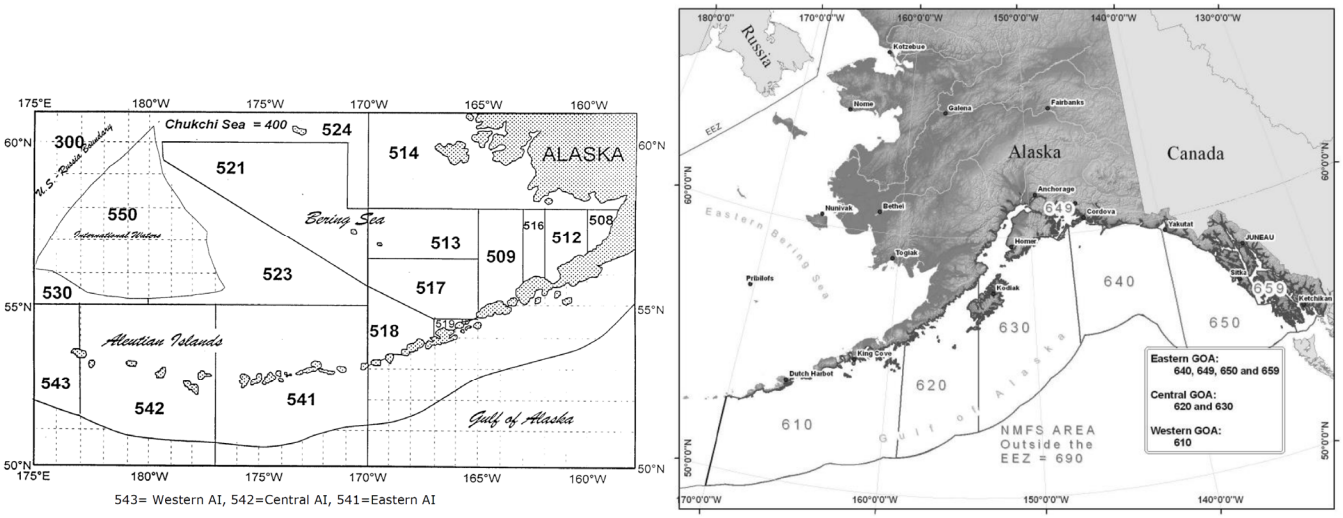

Figure 2. Management areas for federally managed stocks in Bering Sea-Aleutian Islands (left panel) and Gulf of Alaska (right panel). Sources: https://www.ecfr.gov/graphics/pdfs/er15no99.000.pdf, https://alaskafisheries.noaa.gov/sites/default/files/fig3.pdf

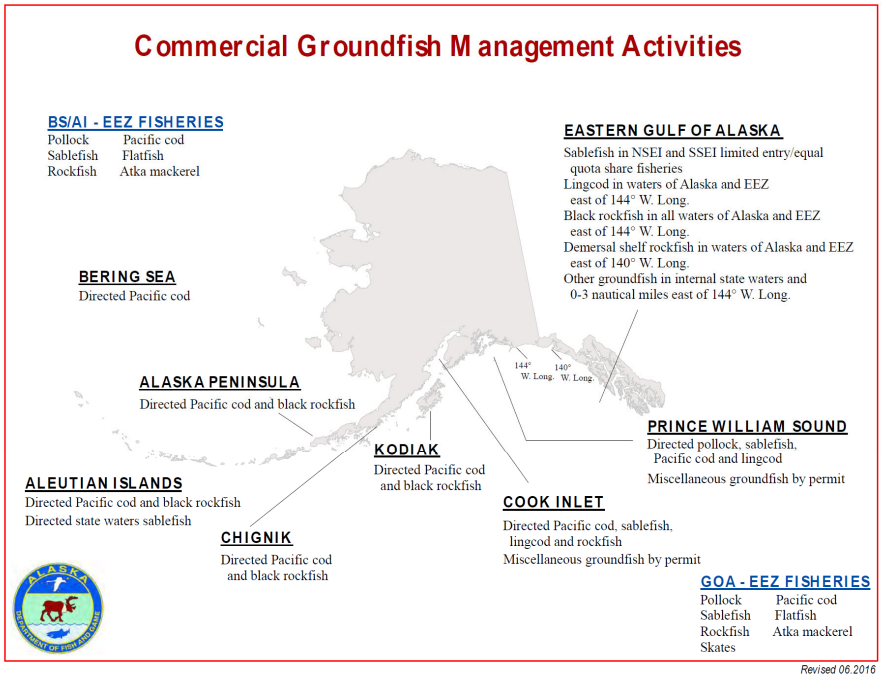

Figure 3. Map showing the eight state managed fishing areas for Pacific cod. Source: http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.groundfishmaps_management

In Alaska state waters (within 3 nautical miles of shoreline), there are eight state-managed Pacific cod fisheries, occurring in these areas: Kodiak, Chignik, South Alaska Peninsula, Aleutian Islands, Southeast Alaska, Prince William Sound, Cook Inlet, and BS/Dutch Harbor. A GHL is set by BOF/ADFG annually for each of these and is calculated from the adjacent federal ABC level. The lone exception is in Southeast Alaska, where a guideline harvest range of 750,000 to 1,250,000 pounds has been put in place since 1994. ADFG also permits a 'parallel fishery' where the state allows fishing against the federal TAC from the adjacent federal waters.

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

The following section on the economics of the fishery are from the 2021 Pacific cod SAFE reports, specifically from the sections by Fissel et al. (2021). Additional detail on the economics of the Alaskan Pacific cod fisheries can be found in the 2020 economic SAFE (Fissel et al. 2020).

Pacific cod's share of the world-wide cod catch was at a high at just over 20% in the early 2000s. Since 2007, global cod catch has grown to 1.85 million t in 2014 and U.S. catch has remained strong at over 300 thousand t since 2011. Total catch of Pacific cod in Alaskan waters was about 321,000 tons in 2015, a drop of about 4% from 2014. In 2014, Pacific cod wholesale production was the second largest in Alaska in terms of volume, following pollock, with a production valued at $468.7 million. Pacific cod production has steadily increased in the last ten years, with a 34% increase in volume in the last five years. European Atlantic cod and U.S. Pacific cod remain the two major sources supplying the Pacific cod market over the past decade accounting for roughly 75% and 20%, respectively. Europe and the U.S. are the primary consumer markets for many of the Pacific cod products. The market for Pacific cod is also affected by activity in the pollock fisheries, as Pacific cod and pollock are commonly used to produce breaded fish portions. U.S. exports of Pacific cod have risen almost proportionally with increasing U.S. cod production. More than 90% of the exports are H&G, most of which goes to China for secondary processing and re-export, and between 2001 and 2011 exports to China increased nearly 10-fold. Japan and Europe (mostly Germany and the Netherlands) are also important export destinations. Approximately 30% of Alaska's Pacific cod production is estimated to remain in the U.S.

BSAI: Pacific cod accounted for 19% of the ex-vessel value for the BSAI catcher vessels in 2020 and catches from trawl gear accounted for 37% of the BSAI Pacific cod value. BSAI trawl catcher vessels (CVs) Pacific cod retained catch decreased 15% in 2020. The realized ex-vessel price of BSAI trawl Pacific cod decreased 7% to $0.346/lb. Price projections from last year's report indicated a decrease as well and had 95% confidence bounds of $0.334/lb to $0.348/lb with a median of $0.341/lb, placing the realized price within the projected range. This year's price projections for the 2021 BSAI trawl Pacific cod ex-vessel price have a median of $0.338/lb with 95% confidence bounds of $0.334/lb to $0.342/lb. These estimates imply that prices in 2021 will likely remain stable. Catch data through Oct. 2021 show a 28% decrease in the year-over-year BSAI trawl Pacific cod catch. BSAI trawl Pacific cod ex-vessel price projections for 2022 and beyond based on historical trends indicate that expected prices may trend up slightly. Because of the substantial volatility a range of potential increases or decreases are plausible. Pacific cod accounted for 19% of the ex-vessel value for the BSAI catcher vessels in 2020 and catches from fixed gear accounted for 64% of the BSAI Pacific cod value. BSAI fixed gear Pacific cod retained catch decreased 3% in 2020. The realized ex-vessel price of BSAI fixed gear Pacific cod decreased 6% to $0.418/lb. Price projections from last year's report indicated a decrease as well and had 95% confidence bounds of $0.400/lb to $0.412/lb with a median of $0.406/lb, placing the realized price above the projected range. This year's price projections for the 2021 BSAI fixed gear Pacific cod ex-vessel price have a median of $0.379/lb with 95% confidence bounds of $0.37/lb to $0.389/lb. These estimates imply that a price decrease in 2021 is likely. Catch data through Oct. 2021 show a 16% decrease in the year-over-year BSAI fixed gear Pacific cod catch. BSAI fixed gear Pacific cod ex-vessel price projections for 2022 and beyond based on historical trends indicate that expected prices may trend up slightly. Because of the substantial volatility a range of potential increases or decreases are plausible.

GOA: Pacific cod accounted for 5% of the ex-vessel value for the GOA CVs in 2020 and catches from trawl gear accounted for 42% of the GOA Pacific cod value. GOA trawl Pacific cod retained catch decreased 27% in 2020. The realized ex-vessel price of GOA trawl Pacific cod decreased 27% to $0.358/lb. Price projections from last year's report indicated a decrease as well and had 95% confidence bounds of $0.325/lb to $0.341/lb with a median of $0.333/lb, placing the realized price above the projected range. This year's price projections for the 2021 GOA trawl Pacific cod ex-vessel price have a median of $0.356/lb with 95% confidence bounds of $0.349/lb to $0.364/lb. These estimates imply that a prices in 2021 will likely remain stable. Catch data through October 2021 show a 134% increase in the year-over-year GOA trawl CV Pacific cod catch. GOA trawl Pacific cod ex-vessel price projections for 2022 and beyond based on historical trends indicate that expected prices may trend up slightly. Because of the substantial volatility a range of potential increases or decreases are plausible.

Pacific cod accounted for 5% of the ex-vessel value for the GOA catcher vessels in 2020 and catches from fixed gear accounted for 59% of the GOA Pacific cod value. GOA fixed gear Pacific cod retained catch decreased 75% in 2020 relative to 2019. The realized ex-vessel price of GOA fixed gear Pacific cod decreased 19% to $0.424/lb. Price projections from last year's report indicated a decrease as well and had 95% confidence bounds of $0.396/lb to $0.415/lb with a median of $0.406/lb, placing the realized price above the projected range. This year's price projections for the 2021 GOA fixed gear Pacific cod ex-vessel price have a median of $0.389/lb with 95% confidence bounds of $0.379/lb to $0.4/lb. These estimates imply that a price decrease in 2021 is likely. Catch data through Oct. 2021 show a 351% increase in the year-over-year GOA fixed gear Pacific cod catch. GOA fixed gear Pacific cod ex-vessel price projections for 2022 and beyond based on historical trends indicate that expected prices may trend up slightly. Because of the substantial volatility a range of potential increases or decreases are plausible.

State-managed fisheries: As noted in in previous section, there are 8 state-managed cod fisheries in Alaskan waters. Some of these are substantial, while others have minimal catch. Gear regulations, seasons, and allocations differ by area, and there are substantial fisheries by jig, pot, and longline in some areas. In total, the sum of the 2020 GHLs (including the upper range of the Southeast Alaska guideline harvest range) is 50,000 tons, with about 1/3 of this being in the BSAI/Dutch Harbor subdistrict. Total state-waters Pacific cod catch in 2020 was estimated to be just over 30,000 tons.

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

3.1.2.1 Eastern Bering Sea

There is a detailed description of the recent fishery in the 2021 EBS cod SAFE by Thompson et al. (2021). Much of the following section and related figures are from that report.

During the early 1960s, a Japanese longline fishery harvested EBS Pacific cod for the frozen fish market. Beginning in 1964, the Japanese trawl fishery for walleye pollock (*Gadus chalcogrammus*) expanded and cod became an important bycatch species and an occasional target species when high concentrations were detected during pollock operations. By the time that the Magnuson Fishery Conservation and Management Act went into effect in 1977, foreign catches of Pacific cod had consistently been in the 30,000-70,000 t range for a full decade. In 1981, a U.S. domestic trawl fishery and several joint venture fisheries began operations in the EBS. The

foreign and joint venture sectors dominated catches through 1988, but by 1989 the domestic sector was dominant and by 1991 the foreign and joint venture sectors had been displaced entirely.

Presently, the Pacific cod stock is exploited by a multiple-gear fishery, including trawl, longline, pot, and jig components (although catches by jig gear are very small in comparison to the other three main gear types, with an average annual catch of less than 200 t since 1991). In the EBS, Pacific cod are caught throughout much of the continental shelf, with NMFS statistical areas 509, 513, 517, 519, 521, and 524 each accounting for at least 5% of the total catch over the most recent 5-year period (2016-2020).

Catches of Pacific cod taken in the EBS for the periods 1964-1980, 1981-1990, and 1991-2021 are shown in Table 5, Table 6, and Table 7, respectively; and the time series for the overall fishery (1977-2021) and by gear type (1988-2021) are shown in Figure 4. The catches in Table 3, Table 4 are broken down by fleet sector (foreign, joint venture, domestic annual processing). The catches in Table 6 are also broken down by gear to the extent possible. The catches in Table 6 and Table 7 are broken down by gear.

Table 5. Summary of 1964-1980 catches (t) of Pacific cod in the EBS by fleet sector. "For." = foreign, "JV" = joint venture processing, "Dom." = domestic annual processing. Catches by gear are not available for these years. Catches may not always include discards. Source: Thompson et al. 2021

Year	For.	JV	Dom.	Total
1964	13,408	0	0	13,408
1965	14,719	0	0	14,719
1966	18,200	0	0	18,200
1967	32,064	0	0	32,064
1968	57,902	0	0	57,902
1969	50,351	0	0	50,351
1970	70,094	0	0	70,094
1971	43,054	0	0	43,054
1972	42,905	0	0	42,905
1973	53,386	0	0	53,386
1974	62,462	0	0	62,462
1975	51,551	0	0	51,551
1976	50,481	0	0	50,481
1977	33,335	0	0	33,335
1978	42,512	0	31	42,543
1979	32,981	0	780	33,761
1980	35,058	8,370	2,433	45,861

Table 6. Summary of 1981-1990 catches (t) of Pacific cod in the EBS by fleet sector, and gear type. All catches include discards. "LLine" = longline, "Subt." = sector subtotal. Breakdown of domestic annual processing by gear is not available prior to 1988. Source: Thompson et al. 2021

	Foreign			Joint Venture		Domestic Annual Processing				
Year	Trawl	LLine	Subt.	Trawl	Subt.	Trawl	LLine	Pot	Subt.	Total
1981	30,347	5,851	36,198	7,410	7,410	n/a	n/a	n/a	12,899	56,507
1982	23,037	3,142	26,179	9,312	9,312	n/a	n/a	n/a	25,613	61,104
1983	32,790	6,445	39,235	9,662	9,662	n/a	n/a	n/a	45,904	94,801
1984	30,592	26,642	57,234	24,382	24,382	n/a	n/a	n/a	43,487	125,103
1985	19,596	36,742	56,338	35,634	35,634	n/a	n/a	n/a	51,475	143,447
1986	13,292	26,563	39,855	57,827	57,827	n/a	n/a	n/a	37,923	135,605
1987	7,718	47,028	54,746	47,722	47,722	n/a	n/a	n/a	47,435	149,903
1988	0	0	0	106,592	106,592	93,706	2,474	299	96,479	203,071
1989	0	0	0	44,612	44,612	119,631	13,935	145	133,711	178,323
1990	0	0	0	8,078	8,078	115,493	47,114	1,382	163,989	172,067

Table 7. Summary of 1991-2021 catches (t) of Pacific cod in the EBS by gear type. The small catches taken by "other" gear types have been merged proportionally with the catches of the gear types shown. Pot catches for 2014-2021 include the State-managed fishery. Catches for 2021 are through September 26. Source: Thompson et al. (2021)

Year	Trawl	Longline	Pot	Total
1991	129,393	77,505	3,343	210,241
1992	77,276	79,420	7,514	164,210
1993	81,792	49,296	2,098	133,186
1994	85,294	78,898	8,071	172,263
1995	111,250	97,923	19,326	228,498
1996	92,029	88,996	28,042	209,067
1997	93,995	117,097	21,509	232,601
1998	60,855	84,426	13,249	158,529
1999	51,939	81,520	12,408	145,867
2000	53,841	81,678	15,856	151,376
2001	35,670	90,394	16,478	142,542
2002	51,118	100,371	15,067	166,555
2003	46,717	108,769	19,957	175,443
2004	57,866	108,618	17,264	183,748
2005	52,638	113,190	17,112	182,940
2006	53,236	96,613	18,969	168,818
2007	45,700	77,181	17,248	140,129
2008	33,497	88,936	17,368	139,802
2009	36,959	96,606	13,609	147,174
2010	41,304	81,815	19,725	142,845
2011	64,084	117,077	28,063	209,224
2012	75,536	128,507	28,738	232,781
2013	81,619	124,863	30,253	236,735
2014	72,262	127,241	39,195	238,698
2015	66,680	128,186	37,942	232,808
2016	72,591	127,923	47,086	247,599
2017	68,885	122,769	46,184	237,837
2018	59,967	100,244	39,686	199,897
2019	49,037	88,751	41,064	178,853
2020	50,579	72,081	32,979	155,639
2021	36,478	52,331	25,468	114,277

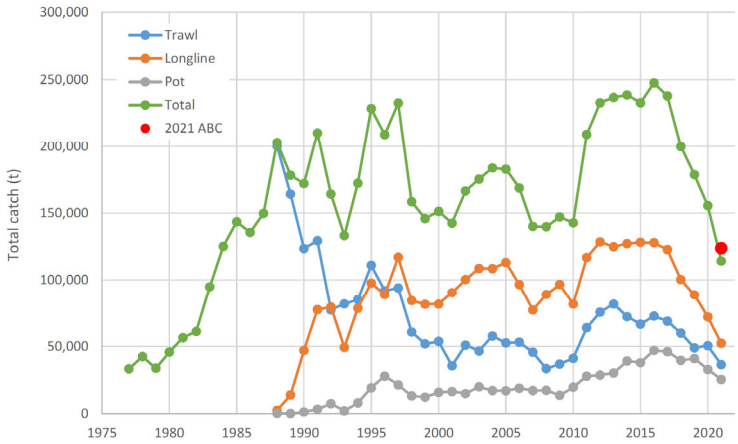

Figure 4. Total catch and catch by gear type. Data for 2021 are current through September 26. Source: Thompson et al. 2021

3.1.2.2 Aleutian Islands

There is a detailed description of the recent fishery in the 2021 AI cod SAFE by Spies et al. (2021). Much of the following section is from that report.

During the early 1960s, Japanese vessels began harvesting Pacific cod in the AI. However, these catches were not large, and by the time the MSA went into effect in 1977, foreign catches of Pacific cod in the AI had not exceeded 4,200 t (Table 8).

Table 8. Catch of Pacific cod in the Aleutian Islands by foreign, domestic, and joint venture fisheries, 1964-1980. Note that joint venture fisheries did not commence until 1981, and domestic catch information is not available prior to 1988. Source: Spies et al. 2021

Year	Foreign	Joint Venture	Domestic	Total
1964	241	0	0	241
1965	451	0	0	451
1966	154	0	0	154
1967	293	0	0	293
1968	289	0	0	289
1969	220	0	0	220
1970	283	0	0	283
1971	2,078	0	0	2,078
1972	435	0	0	435
1973	977	0	0	977
1974	1,379	0	0	1,379
1975	2,838	0	0	2,838
1976	4,190	0	0	4,190
1977	3,262	0	0	3,262
1978	3,295	0	0	3,295
1979	5,593	0	0	5,593
1980	5,788	0	0	5,788

Joint venture fisheries began operations in the AI in 1981, and peaked in 1987, with catches totaling over 10,000 t. Foreign fishing for AI Pacific cod ended in 1986, followed by an end to joint venture fishing in 1990 (Table 9). Domestic fishing for AI Pacific cod began in 1981, with a peak catch of over 43,000 t in 1992 (Table 10).

Table 9. Summary of catches of Pacific cod (t) in the Aleutian Islands by gear type. All catches include discards. Domestic annual catch by gear is not available prior to 1988. Source: Spies at al. 2021

Year	Foreign			Joint Venture	Domestic			Total
	Trawl	Longline	Total	Trawl	Trawl	Longline and pot	Total	
1981	2,680	235	2,915	1,749	-	-	2,770	7,434
1982	1,520	476	1,996	4,280	-	-	2,121	8,397
1983	1,869	402	2,271	4,700	-	-	1,459	8,430
1984	473	804	1,277	6,390	-	-	314	7,981
1985	10	829	839	5,638	-	-	460	6,937
1986	5	0	5	6,115	-	-	786	6,906
1987	0	0	0	10,435	-	-	2,772	13,207
1988	0	0	0	3,300	1,698	167	1,865	5,165
1989	0	0	0	6	4,233	303	4,536	4,542
1990	0	0	0	0	6,932	609	7,541	7,541

Table 10. Federal and state fishery catch in metric tons by year, 1991-2021. To avoid confidentiality problems, federal longline and pot catches have been combined. The small catches taken by "other" gear types have been merged proportionally with the catches of the gear types shown. Catches for 2021 are through October 30. Source: Spies at al. 2021

Year	Federal		State	Total
	Trawl	Longline+Pot	Total	
1	1991	3,414	6,383	9,798
2	1992	14,559	28,425	43,068
3	1993	17,312	16,860	34,205
4	1994	14,383	7,156	21,539
5	1995	10,574	5,960	16,534
6	1996	21,179	10,430	31,609
7	1997	17,349	7,726	25,164
8	1998	20,531	14,196	34,726
9	1999	16,437	11,624	28,130
10	2000	20,362	19,290	39,685
11	2001	15,827	18,362	34,207
12	2002	27,929	2,872	30,801
13	2003	31,478	978	32,457
14	2004	25,770	3,103	28,873
15	2005	19,613	3,068	22,694
16	2006	20,062	4,141	24,211
17	2007	28,631	5,716	34,355
18	2008	21,826	9,193	31,229
19	2009	20,822	7,740	28,582
20	2010	18,872	10,134	29,006
21	2011	9,382	1,506	10,889
22	2012	12,139	6,059	18,220
23	2013	8,123	5,489	13,612
24	2014	6,766	3,818	10,583
25	2015	6,129	3,080	9,210
26	2016	11,535	1,696	13,232
27	2017	8,537	6,633	15,170
28	2018	10,119	10,240	20,414
29	2019	10,294	8,752	19,187
30	2020	4,316	9,929	14,250
31	2021	3,216	9,666	12,882

Presently, the Pacific cod stock is exploited by a multiple-gear fishery, including pot, trawl and longline components. Pacific cod in the AI are exploited in the federal and state fisheries.

Catch per unit effort (CPUE) has decreased by all metrics since approximately 2015, including seasonally by trawl gear and for longline gear. Recent declines in CPUE may be attributed to the timing of the fishery relative to spawning season or other factors such as hyper-aggregation during spawning in the trawl fishery (Rose and Kulka 1999). Standardized surveys are needed to understand whether declines in fishery CPUE represent declines in AI Pacific cod stock size.

The catches shown in Table 8, Table 9, and Table 10 include estimated discards. Discard amounts and rates of Pacific cod in the AI Pacific cod fisheries are always a small proportion since the last decade. Amendment 49, which mandated increased retention and utilization of Pacific cod, was implemented in 1998. From 1991-1998, discard rates in the Pacific cod fishery averaged about 5.6%. Since 1998, they have averaged about 1.0%.

3.1.2.3 Management of the BSAI Pacific cod fishery

Federal management

The following has been adapted from (NPFMC 2019a). Management of the BSAI Pacific cod fishery is set out Pacific cod harvest specifications establish an OFL, ABC, and TAC for the BS subarea of the BSAI, and a separate OFL, ABC, and TAC for the AI subarea of the BSAI. Before the Pacific cod TACs are established, the Council and NMFS consider social and economic factors, and management uncertainty, as well as two factors that are particularly relevant to BSAI Pacific cod: Pacific cod GHL fisheries that occur in the State of Alaska waters of the BSAI, and an overall limit on the maximum amount of TAC that can be specified for BSAI groundfish.

Over the better part of two decades the Council has established and modified an allocation system for BSAI Pacific cod through a series of FMP amendments. Currently, Federal regulations at 50 CFR 679.20(a)(7) authorize distinct BSAI Pacific cod allocations of the initial total allowable catch for the following sectors:

- Hook and line catcher processors (C/Ps) – 48.7%
- Trawl catcher vessels CVs – 22.1%
- Amendment 80 – 13.4%
- Pot CVs ≥60 feet length overall – 8.4%
- American Fisheries Act (AFA) trawl C/Ps – 2.3%
- Hook and line and pot CVs < 60 feet length overall – 2%
- Pot C/Ps – 1.5%
- Jig vessels – 1.4%
- Hook and line CVs ≥60 feet length overall - 0.2%

The current allocations were the result of Amendment 85 to the FMP for Groundfish of the BSAI Management Area which were effective January 1, 2008, the implicit objectives of which were to:

- Establish allocations that more closely reflect historical use by the sectors than previously
- Consider catch history, socioeconomic, and community factors to include allocations to small boat sectors to expand entry-level and local opportunities in the BSAI Pacific cod fishery
- Reduce the need for in-season reallocations during the fishing year
- Reduce uncertainty about the availability of yearly harvests within sectors caused by reallocations
- Provide stability among sectors in the BSAI Pacific cod fishery

Once the TACs are established, regulations at § 679.20(a)(7)(i) allocate 10.7% of the Bering Sea Pacific cod TAC and 10.7% of the AI Pacific cod TAC to the CDQ Program for the exclusive harvest by Western Alaska CDQ groups. The remaining portion of TAC after deducting the 10.7% allocation for CDQ Program is the initial total allowable catch. For the HAL and pot gear sectors, NMFS estimates an incidental catch allowance that will be deducted from the aggregate portion of Pacific cod TAC allocated to the HAL and pot gear sectors before the allocations to these sectors.

After subtraction of the CDQ allocation from the BS and AI TACs, NMFS combines the remaining BS and AI TACs into one BSAI non-CDQ TAC, which is available for harvest by the nine non-CDQ fishery sectors listed above.
NMFS manages each of the non-CDQ fishery sectors to ensure harvest of Pacific cod does not exceed the overall annual allocation made to each of the non-CDQ fishery sectors. NMFS monitors harvests that occur while vessels are directed fishing for Pacific cod (specifically targeting and retaining Pacific cod above specific threshold levels) and harvests that occur while vessels are directed fishing in other fisheries and incidentally catching Pacific cod (e.g., the incidental catch of Pacific cod while directed fishing for pollock). For the non-AFA trawl C/P sector, also known as the Amendment 80 sector, NMFS allocates exclusive harvest privileges to these vessels participating in an Amendment 80 cooperative and prohibits them from exceeding their cooperative allocation. For other non-CDQ fishery sectors, NMFS carefully tracks both directed and incidental catch of Pacific cod. NMFS takes appropriate management measures, such as closing directed fishing for a non-CDQ fishery sector, to ensure that total directed fishing and incidental catch do not exceed that sector's allocation.

An allocation to a non-CDQ fishery sector may be harvested in either the BS or the AI, subject to the non-CDQ Pacific cod TAC specified for the BS or the AI. If the non-CDQ Pacific cod TAC is or will be reached in either the BS or AI, NMFS will prohibit directed fishing for Pacific cod in that subarea for all non-CDQ fishery sectors.

Allocations of Pacific cod to the CDQ Program and to the non-CDQ fishery sectors are further apportioned by seasons. In general, regulations apportion CDQ and non-CDQ fishery sector allocations among three seasons that correspond to the early (A-season), middle (B-season), and late (C-season) portions of the year. Depending on the specific CDQ Program or non-CDQ fishery sector allocation, between 40% and 70% of the Pacific cod allocation is apportioned to the A-season, historically the most lucrative fishing season due to the presence of valuable roe in the fish and the good quality of the flesh during that time of year.

To help ensure the efficient management of Pacific cod allocations, regulations allow NMFS to reallocate (rollover) any unused portion of a seasonal apportionment from any non-CDQ fishery sector (except the jig sector) to that sector's next season during the current fishing year, unless the Regional Administrator determines a non-CDQ fishery sector will not be able to harvest its allocation.

State management

The State of Alaska has managed a GHL fishery for Pacific cod in State waters in the AI subarea since 2006 and in the Dutch Harbor subarea of the BS since 2014. The GHL fishery opens after the federal fishery closes to directed fishing.

For the Dutch Harbor subarea BS, the GHL has 8% of the BS ABC. If the GHL is fully harvested (90% is considered fully harvested), the limit is then increased by 1% of the BS ABC each year until it reaches 15% in 2026. The 15% GHL would continue unless changed by the BOF. All of the catch is delivered to shoreside plants since it is harvested by pot vessels that are less than or equal to 58 ft.

In 2019, the BOF also created a 100,000 lb. (45 mt) GHL jig fishery for Pacific cod in the Dutch Harbor subarea.

For the AI, the GHL was 3% of the Federal BSAI Pacific cod ABC from 2006 through the 2015 fishing season. Starting in 2016, the AI GHL changed to 27% of the AI ABC, with annual step-up provisions if the AI GHL is fully harvested to a maximum of 39% of the AI ABC. The annual step-up provision remains in place if the GHL is fully harvested. The GHL is considered fully harvested at 90% harvested. At the BOF October 2018 meeting, the BOF included a four% step-down provision if the AI GHL is not fully harvested (90% is considered fully harvested) during two consecutive calendar years. The GHL may not be reduced below 15% of the federal AI Pacific cod ABC.

While trawl, longline, pot, and jig gear are allowed at various times during the GHL fishery, overall, most of the AI GHL has been harvested by vessels using trawl and pot gear. Harvest information from the AI Pacific cod GHL fishery is confidential in recent years due to the number of participants in the processing sector.

The combined increases in the GHL for the AI and the BS and the creation of the new 45 mt jig gear GHL have a reciprocal reduction in the amount of available BSAI Pacific cod for each sector that participates in the federal BSAI Pacific cod fishery.

In the BS and AI, vessels can fish inside state waters under federal TACs. This is called a parallel fishery. Vessels can participate in a parallel fishery with or without federal permitting (federal fishery permit or License Limitation Program (LLP) with their harvest deducted from federal TACs (which are allocated between vessel length, gear type, and C/Ps vs CVs).

3.1.2.4 Gulf of Alaska

There is a detailed description of the recent fishery in the 2021 GOA cod SAFE by Barbeaux et al. (2021). Much of the following section is from that report.

During the two decades prior to passage of the MSA in 1976, the fishery for Pacific cod in the GOA was small, averaging around 3,000 t per year. Most of the catch during this period was taken by the foreign fleet, whose catches of Pacific cod were usually incidental to directed fisheries for other species. By 1976, catches had increased to 6,800 t. Catches of Pacific cod since 1991 are shown in

Table 11. Presently, the Pacific cod stock is exploited by a multiple-gear fishery, including trawl, longline, pot, and jig components. Trawl gear took the largest share of the catch in every year but one from 1991-2002, although pot gear has taken the largest single-gear share of the catch in each year since 2003. Figure 5 shows landings by gear since 1977.

Table 11 shows the catch by jurisdiction and gear type.

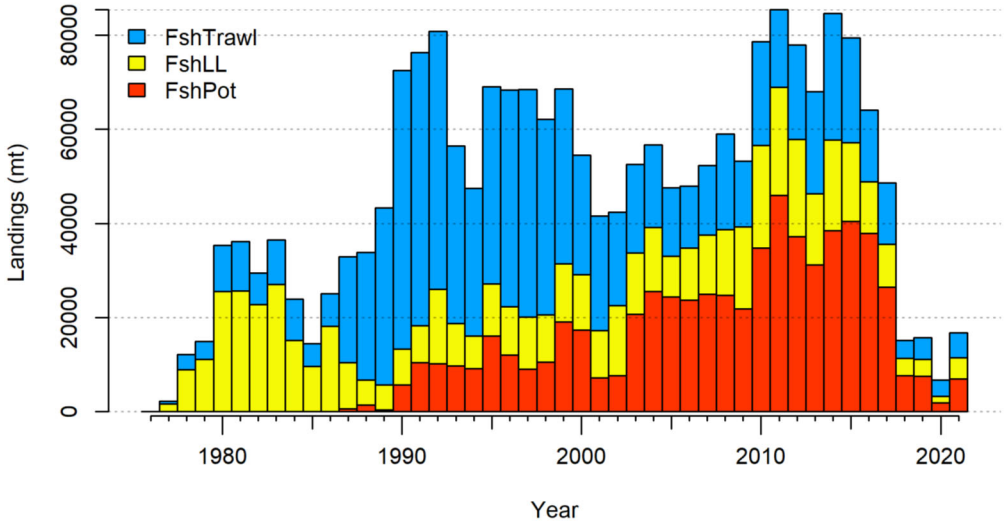

Figure 5. Gulf of Alaska Pacific cod catch from 1977-2021. Note that 2021 catch was through October 1. Source: Barbeaux et al. 2021

Table 11. Catch (t) for 1991 through 2021 by jurisdiction and gear type (as of 2021-10-04). Source: Barbeaux et al. 2021

	Federal					State				
Year	Trawl	Long-line	Pot	Other	Subtotal	Long-line	Pot	Other	Subtotal	Total
1991	58,093	7,656	10,464	115	76,328	0	0	0	0	76,328
1992	54,593	15,675	10,154	325	80,747	0	0	0	0	80,747
1993	37,806	8,963	9,708	11	56,488	0	0	0	0	56,488
1994	31,447	6,778	9,161	100	47,485	0	0	0	0	47,485
1995	41,875	10,978	16,055	77	68,985	0	0	0	0	68,985
1996	45,991	10,196	12,040	53	68,280	0	0	0	0	68,280
1997	48,406	10,978	9,065	26	68,476	0	7,224	1,319	8,542	77,018
1998	41,570	10,012	10,510	29	62,121	0	9,088	1,316	10,404	72,525
1999	37,167	12,363	19,015	70	68,614	0	12,075	1,096	13,171	81,785
2000	25,443	11,660	17,351	54	54,508	0	10,388	1,643	12,031	66,560
2001	24,383	9,910	7,171	155	41,619	0	7,836	2,084	9,920	51,542
2002	19,810	14,666	7,694	176	42,345	0	10,423	1,714	12,137	54,483
2003	18,884	9,525	12,765	161	41,335	62	7,943	3,242	11,247	52,582
2004	17,513	10,326	14,966	400	43,205	51	10,602	2,765	13,419	56,624
2005	14,549	5,732	14,749	203	35,233	26	9,653	2,673	12,351	47,584
2006	13,132	10,244	14,540	118	38,034	55	9,146	662	9,863	47,897
2007	14,775	11,539	13,573	44	39,932	270	11,378	682	12,329	52,261
2008	20,293	12,106	11,230	63	43,691	317	13,438	1,568	15,323	59,014
2009	13,976	13,968	11,951	206	40,101	676	9,919	2,500	13,096	53,196
2010	21,765	16,540	20,116	429	58,850	826	14,604	4,045	19,475	78,325
2011	16,453	16,668	29,233	722	63,076	1,035	16,675	4,627	22,337	85,412
2012	20,072	14,467	21,238	722	56,499	866	15,940	4,613	21,419	77,918
2013	21,700	12,866	17,011	476	52,053	1,089	14,156	1,303	16,547	68,600
2014	26,798	14,749	19,957	1,046	62,550	1,007	18,445	2,838	22,290	84,841
2015	22,269	13,054	20,653	408	56,384	578	19,719	2,808	23,104	79,489
2016	15,217	8,153	19,248	346	42,964	806	18,609	1,708	21,123	64,087
2017	13,041	8,978	13,426	67	35,512	149	13,011	62	13,222	48,734
2018	3,817	2,964	4,014	121	10,916	36	3,660	194	3,889	14,805
2019	4,537	2,737	3,732	178	11,184	78	3,820	329	4,227	15,411
2020	3,427	459	30	0	3,916	50	1,780	488	2,318	6,233
2021	5,257	2,967	2,653	52	10,930	276	4,229	1,068	5,573	16,502

Changes in ABC over time are typically attributable to three factors: 1) changes in resource abundance, 2) changes in management strategy, and 3) changes in the stock assessment model. Assessments conducted prior to 1988 were based on survey biomass alone. From 1988-1993, the assessment was based on stock reduction analysis (Kimura et al. 1984). From 1994-2004, the assessment was conducted using the Stock Synthesis 1 modeling software (Methot 1986, 1990) with length-based data. The assessment was migrated to Stock Synthesis 2 (SS2) in 2005 (Methot 2005), at which time age-based data began to enter the assessment. Several changes have been made to the model within the SS2 framework (renamed “Stock Synthesis,” or SS3, in 2008) each year since then.

For the first year of management under the Magnuson-Stevens Fishery Conservation and Management Act in 1977, the catch limit for GOA Pacific cod was established at slightly less than the 1976 total reported landings. During the period 1978-1981, catch limits varied between 34,800 and 70,000 t, settling at 60,000 t in 1982. Prior to 1981 these limits were assigned for “fishing years” rather than calendar years. In 1981 the catch limit was raised temporarily to 70,000 t and the fishing year was extended until December 31 to allow for a smooth transition to management based on calendar years, after which the catch limit returned to 60,000 t until 1986, when ABC began to be set on an annual basis. From 1986 (the first year in which an ABC was set) through 1996, TAC averaged about 83% of ABC and catch averaged about 81% of TAC. In 8 of those 11 years, TAC equaled ABC exactly. In 2 of those 11 years (1992 and 1996), catch exceeded TAC.

To understand the relationships between ABC, TAC, and catch for the period since 1997, it is important to understand that a substantial fishery for Pacific cod has been conducted during these years inside State of Alaska waters (

Table 11), mostly in the Western and Central Regulatory Areas. To accommodate the State-managed fishery, the Federal TAC was set well below ABC (15-25% lower) in each of those years. Thus, although total (Federal plus State) catch has exceeded the Federal TAC in 16 of the 23 years since 1997, this is basically an artifact of the bi-jurisdictional nature of the fishery and is not evidence of overfishing as this would require exceeding OFL. At no time since the separate State waters fishery began in 1997 has total catch exceeded ABC, and total catch has never exceeded OFL.

Historically, most of the GOA catch has come from the Central regulatory area. To some extent the distribution of effort within the GOA is driven by regulation, as catch limits within this region have been apportioned by area throughout the history of management under the MFCMA. Changes in area-specific allocation between years have usually been traceable to changes in biomass distributions estimated by Alaska Fisheries Science Center (AFSC) trawl surveys or management responses to local concerns. Currently the area-specific ABC allocation is derived from the random effects model (which is similar to the Kalman filter approach).

In addition to area allocations, GOA Pacific cod is also allocated on the basis of processor component (inshore/offshore) and season. The inshore component is allocated 90% of the TAC and the remainder is allocated to the offshore component. Within the Central and Western Regulatory Areas, 60% of each component's portion of the TAC is allocated to the A season (January 1 through June 10) and the remainder is allocated to the B season (June 11 through December 31, although the B season directed fishery does not open until September 1).

NMFS has also published the following rule to implement Amendment 83 to the GOA Groundfish FMP:

> Amendment 83 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. These allocations apply to both annual and seasonal limits of Pacific cod for the applicable sectors. These apportionments are discussed in detail in a subsequent section of this rule. Amendment 83 is intended to reduce competition among sectors and to support stability in the Pacific cod fishery. The final rule implementing Amendment 83 limits access to the Federal Pacific cod TAC fisheries prosecuted in State of Alaska (State) waters adjacent to the Western and Central regulatory areas in the GOA, otherwise known as parallel fisheries. Amendment 83 does not change the existing annual Pacific cod TAC allocation between the inshore and offshore processing components in the Eastern regulatory area of the GOA.
>
> In the Central GOA, NMFS must allocate the Pacific cod TAC between vessels using jig gear, catcher vessels (CVs) less than 50 feet (15.24 meters) length overall using hook-and-line gear, CVs equal to or greater than 50 feet (15.24 meters) length overall using hook-and-line gear, catcher/processors (C/Ps) using hook-and-line gear, CVs using trawl gear, C/Ps using trawl gear, and vessels using pot gear. In the Western GOA, NMFS must allocate the Pacific cod TAC between vessels using jig gear, CVs using hook-and-line gear, C/Ps using hook-and-line gear, CVs using trawl gear, and vessels using pot gear. Table 3 lists the proposed amounts of these seasonal allowances. For the Pacific cod sector splits and associated management measures to become effective in the GOA at the beginning of the 2012 fishing year, NMFS published a final rule (76 FR 74670, December 1, 2011) and will revise the final 2012 harvest specifications (76 FR 11111, March 1, 2011).
>
> NMFS proposes to calculate of the 2012 and 2013 Pacific cod TAC allocations in the following manner. First, the jig sector would receive 1.5 percent of the annual Pacific cod TAC in the Western GOA and 1.0 percent of the annual Pacific cod TAC in the Central GOA, as required by proposed § 679.20(c)(7). The jig sector annual allocation would further be apportioned between the A (60 percent) and B (40 percent) seasons as required by § 679.20(a)(12)(i). Should the jig sector harvest 90 percent or more of its allocation in a given area during the fishing year, then this allocation would increase by one percent in the subsequent fishing year, up to six percent of the annual TAC. NMFS proposes to allocate the remainder of the annual Pacific cod TAC based on gear type, operation type, and vessel length overall in the Western and Central GOA seasonally as required by proposed § 679.20(a)(12)(A) and (B).

The longline and trawl fisheries are also associated with a Pacific halibut mortality limit which sometimes constrains the magnitude and timing of harvests taken by these two gear types.

Data for managing the GOA groundfish fisheries are collected in multiple ways. The primary source of catch composition data in the federally managed fisheries for Pacific cod are collected by on-board observers (Faunce et al. 2017). ADFG samples individual deliveries for state managed fisheries (Nichols et al. 2015). Overall catch delivered is reported through a (historically) paper and electronic catch reporting system. Total catch is estimated through a blend of catch reporting, observer, and electronic monitoring (EM) data (Cahalan et al. 2014).

In the 1970s and early to mid-1980s the majority of Pacific cod catch in the GOA was taken by foreign vessels using longline. With the development of the domestic GOA trawl fleet in the late 1980's trawl vessels took an increasing share of Pacific cod and Pacific cod catch increased sharply to around 70,000 t throughout the 1990's. Although there had always been Pacific cod catch in crab pots, pots

were first used to catch a measurable amount of Pacific cod in 1987. This sector initially comprised only a small portion of the catch, however by 1991 pots caught 14% of the total catch. Throughout the 1990s the share of the Pacific cod caught by pots steadily increased to more than a third of the catch by 2002. The portion of catch caught by the pot sector steeply increased in 2003 with incoming Steller sea lion regulations and halibut bycatch limiting trawl and for 2003 through 2021 the pot sector caught on average 58% of the total catch of Pacific cod in the GOA annually.

In 2015 combined state and federal catch was 79,489 t (23%) below the ABC while in 2016 combined catch was 64,087 t (35% below the ABC) and in 2017 catch was 48,734 t (45% below the ABC). The ABC was substantially reduced for 2018 to 18,000 t from 88,342 t in 2017, an 81% reduction. This was a 65% reduction from the realized 2017 catch. In 2018 the total catch was 15,247 t. For 2019 the ABC was set below the maximum ABC at 17,000 t and combined fishery caught 15,411 t which was 91% of the ABC.

In 2020, the spawning stock biomass (SSB) was projected to have dropped below 20% of the unfished SSB (B20%) and the federal Pacific cod fishery in the GOA was closed by regulation to directed Pacific cod fishing. B20% is a minimum SSB threshold instituted to help ensure adequate forage for the endangered western stock of Steller sea lions. 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 State of Alaska 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. ADF&G 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, the state having taken 2,318 t (91% of the GHL), and federal fisheries haven 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. As of October 4, 2021, a total of 16,502 t (69% of the ABC) has been harvested. State fisheries have 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 11), 32% by trawl, 1and 8% by longline, while jig and other gear harvested less than 7%.

The largest component of incidental catch of other targeted groundfish species in the GOA Pacific cod fisheries by weight are skate species in combination followed by walleye pollock, shark species, rock sole, arrowtooth flounder, and octopus. Rockfish and sculpin species also make up a major component of the bycatch in these fisheries.

3.2 Target species biology

There are numerous sources of information on Pacific cod biology, including the three Pacific cod SAFE documents for 2021 (EBS, Thompson et al. 2021; AI, Spies et al. 2021; GOA, Barbeaux et al. 2021), various primary publications, and other NMFS and ADFG reports. Much of the brief overview that follows in this section has been taken from the AFSC website, which provides summaries for Pacific cod biology and relevant studies under various headings.

Pacific cod are moderately fast growing and relatively short-lived fish, with a maximum age of approximately 18 years. Females reach 50% maturity at around 4.4 years in the GOA and 4.9 years in the EBS Pacific cod females grow significantly faster in the BS than in the GOA. Males reach a smaller maximum length in the GOA than females, while in contrast, BS males reach a similar maximum length as females. Pacific cod begin to recruit to trawl fisheries at age 3 but are not fully recruited to all gear types until about age 7.

Pacific cod are demersal and concentrate on the shelf edge and upper slope (100-250 m) in the winter and move to shallower waters (<100 m) in the summer. Juveniles occur mostly over the inner continental shelf at depths of 60 to 150 m. Pacific cod consume a wide range of prey, such as clams, polychaete worms, crabs, shrimp, amphipods, euphausiids, and a variety of fish including pollock and yellowfin sole. They are prey for halibut and marine mammals, as well as for a few shark and bird species.

In a study which took place in BS in 2005-2007, most spawning activity was observed on the Bering Sea shelf and AI plateaus between 100 and 200 m depth, during late February to mid-April (Neidetcher et al. 2014). Fecundity of Pacific. cod is high and large females produce well more than a million eggs each year. Spawning takes place near bottom, eggs sink to the bottom after fertilization, and they are somewhat adhesive. Optimal temperature for incubation is between 3° and 6°C. Little is known about the distribution of Pacific cod larvae in Alaskan waters.

The authors of all three SAFE reports note that it is conceivable that mortality rates, both fishing and natural, likely vary with age in Pacific cod. In particular, very young fish likely have higher natural mortality rates than older fish. Although there is not much known about the likelihood of age-dependent natural mortality in adult Pacific cod, it has been suggested in some studies that Atlantic cod may exhibit increasing natural mortality with age.

3.3 Scientific stock assessment

3.3.1.1 EBS

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 HCR. $B_{40\%}$ can be considered a proxy for the biomass of maximum sustainable yield (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 F 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 Scientific and Statistical Committee (SSC) ensemble, are listed in the table 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 6). 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 B_{MSY} 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 B_{MSY} proxy (Table 12).

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 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.

Table 12. 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.

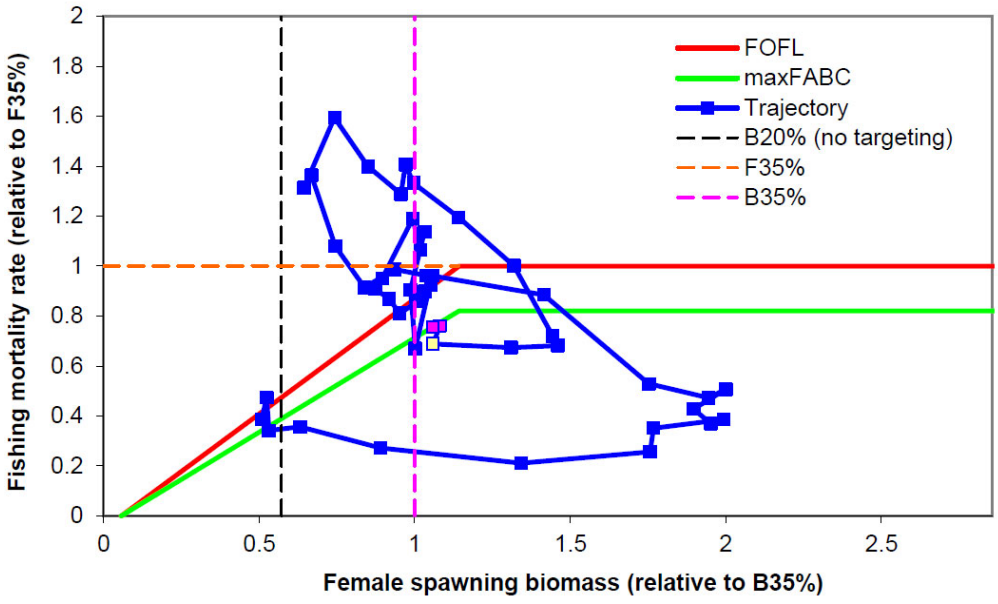

Figure 6. Trajectory of EBS Pacific cod F and female SSB as estimated by ensemble model. Source: Thompson et al. 2021

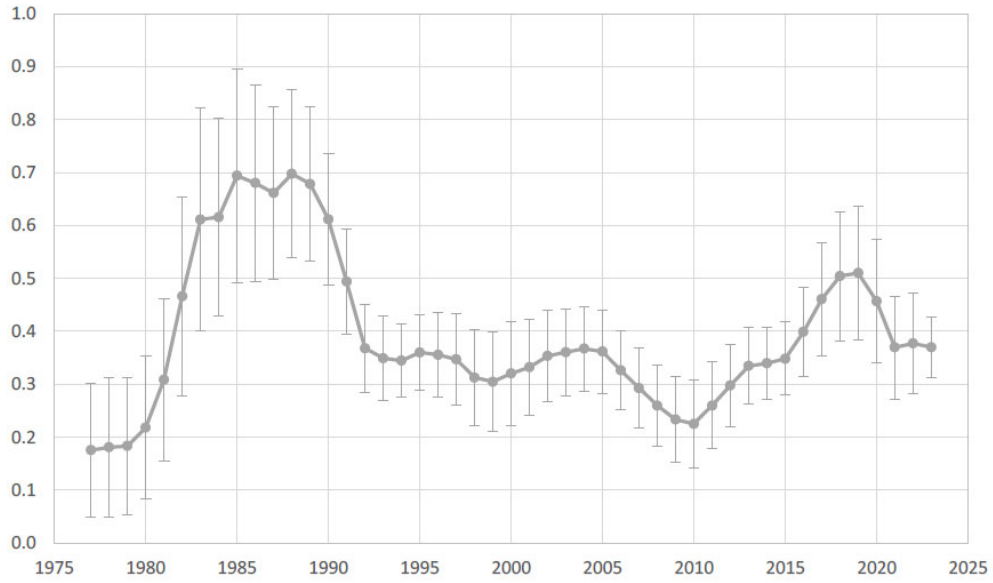

Figure 7. Ensemble estimates of relative SSB, +/− 2 standard deviations. Source: Thompson et al. 2021

Table 13. 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

3.3.1.2 AI

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 AI 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 AI 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 AI 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 AI 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 AI 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.

The principal results of the present assessment, based on the authors' recommended model, are listed in the tables below. Two tables (

Table 14 and Table 15) 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 8 and Figure 9. 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 5 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 14. 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 15. 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

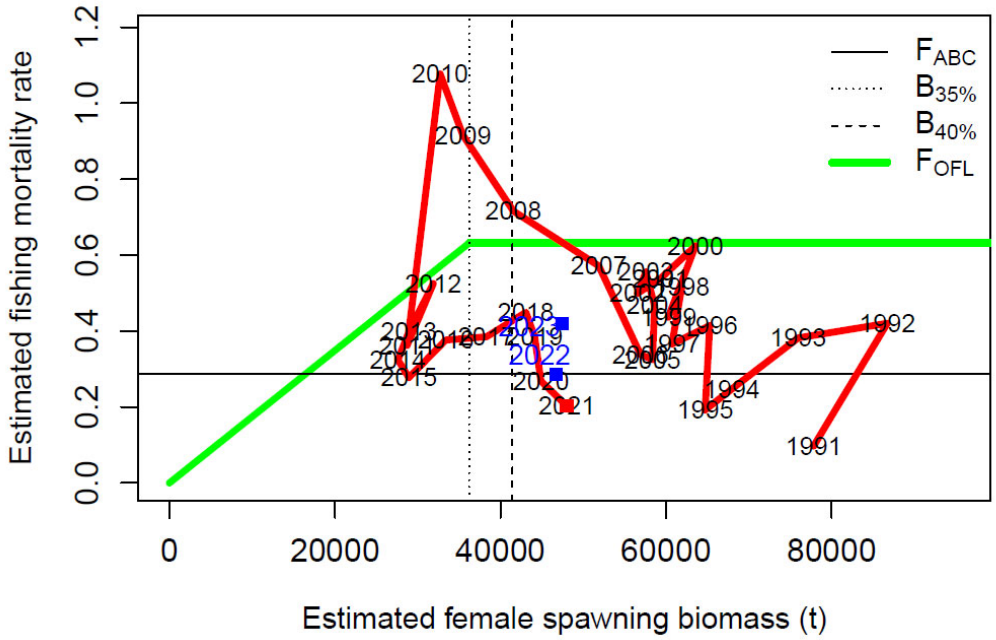

Figure 8. Phase plane diagram showing the time-series of stock assessment model estimates of female SSB relative to the HCR, with assessment model results for 1991-2021 and projection model results for 2022 and 2023 (blue squares). Alternative 3 projections (fishing at the average F rate for the past five years) were used for the 2022 and 2023 values. Source: Spies et al. 2021

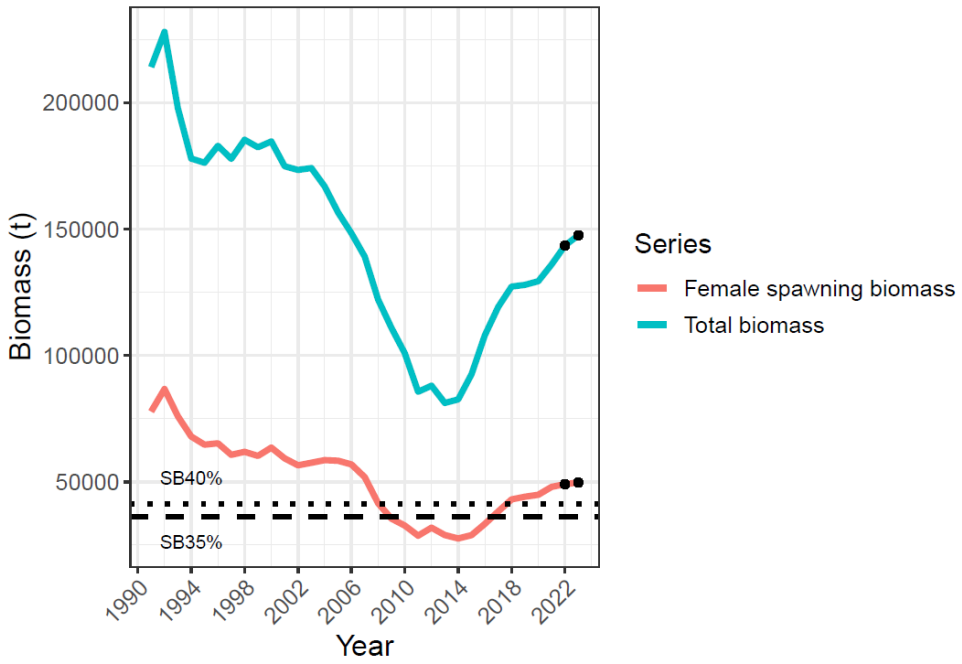

Figure 9. Estimates for total (age 1+) biomass and female SSB from 1991-2021, and projection model estimates for 2022 and 2023. Reference points $SB_{40\%}$ and $SB_{35\%}$ are shown as horizontal lines. Source: Spies et al. 2021

3.3.1.3 GOA

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 CFSR 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 Model 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 the conditional age at length data. However, the seine data index conflicted 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 Table 16 and Table 17 and Figure 10.

Table 16. 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 17. 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.*

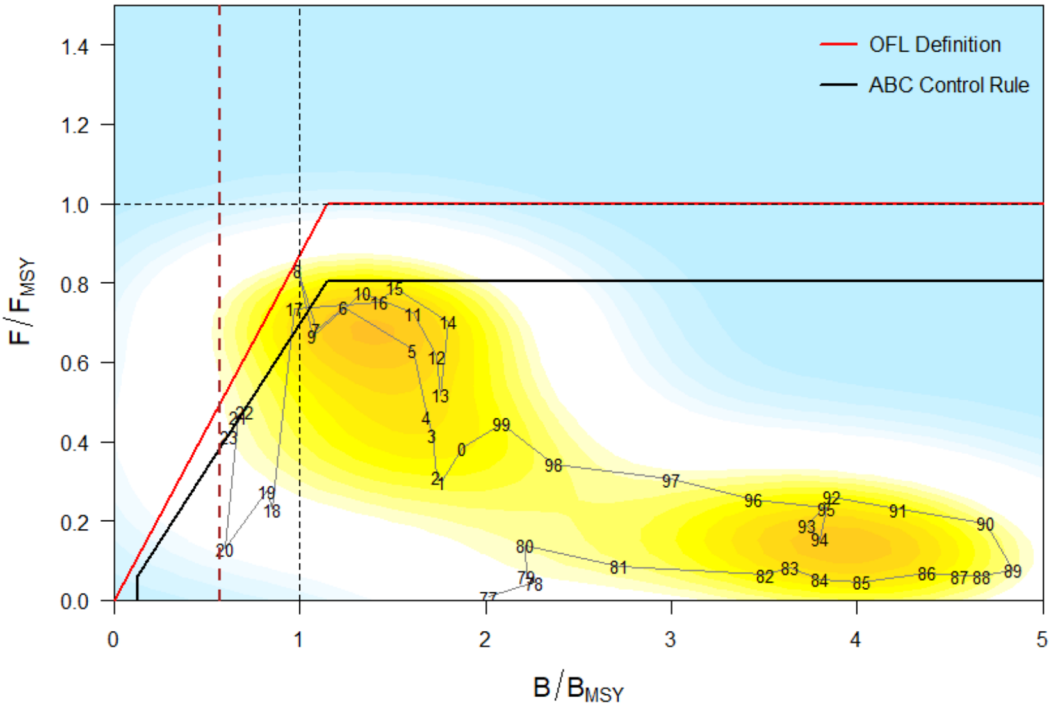

Figure 10. For Model 21.2 ratio of historical F/F_{MSY} versus female SSB relative to B_{MSY} for GOA pacific cod, 1977-2023. Note that the proxies for F_{MSY} and B_{MSY} are $F_{35\%}$ and $B_{35\%}$, respectively. The Fs presented are the sum of the full Fs across fleets. Dashed line is at $B_{20\%}$, Steller sea lion closure rule for GOA Pacific cod. Source: Barbeaux et al. 2021

The data as interpreted through Model 21.2 indicate 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 11).

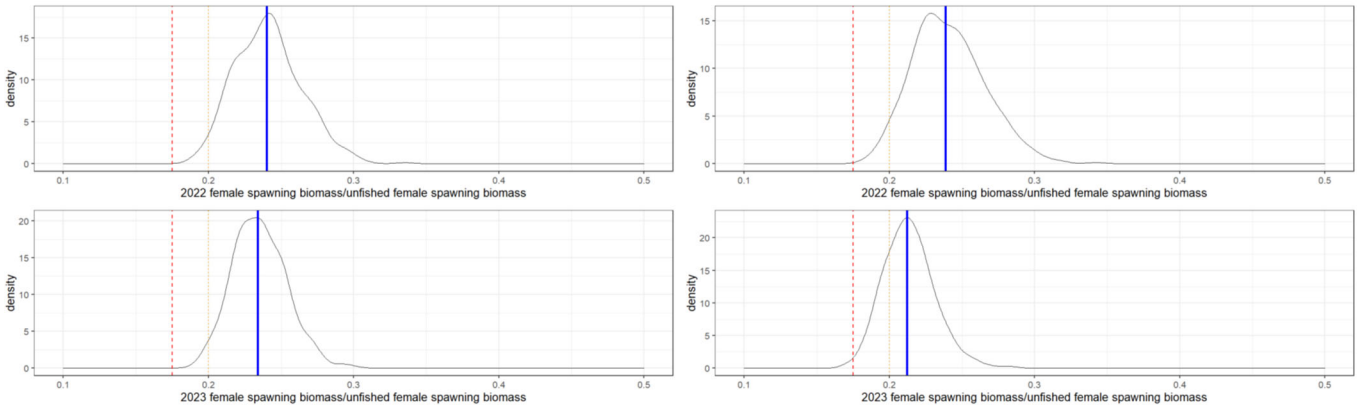

Figure 11. Model 21.2 MCMC Projection A (left panels) and B (right panels) posterior distributions of the 2022 (top) and 2023 (bottom) SSB ratio with estimates for SSB20% (orange dotted line) and SSB17.5% (Red dashed line) from the projection model, and posterior median (blue solid line) for beginning year 2022 and 2023. Source: Barbeaux et al. 2021

3.4 International fishery stock assessment guidance

Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research and stock assessment developed within the AFSC. The annual stock assessments use state-of-the-art methodology, and are peer reviewed by experts within NMFS, ADFG, and at committee levels in the Council (e.g., SSC). Recommendations are made annually to improve the assessments. Regular external peer review is also conducted on the assessments (e.g., by the Center of Independent Experts [CIE]), and recommendations from these reviews are addressed when possible.

3.5 Published stock assessments conducted by third party organizations

The assessment team was not aware of any third-party stock assessments for the Pacific cod stock.

3.6 Management practices of the competent management authority

The amended MSA in 2007 established new statutory requirements to end and prevent overfishing. It required the SSC of the eight fishery management councils to recommend, "*acceptable biological catch, preventing overfishing, maximum sustainable yield and achieving rebuilding targets and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures and sustainability of fishing practices*" and for the Councils to set annual catch limits that do not exceed the fishing level recommended by their SSC. These new requirements were implemented in 2010 for all stocks subject to overfishing and in 2011 for all stocks not subject to overfishing.

This separation of authorities and responsibilities represented a major step forward in trying to eliminate overfishing and to enhance recovery of overfished stocks nationwide.

Assuming that catch is measured accurately, annual catch limits provide a transparent measure of the effectiveness of management practices to prevent overfishing. They cannot exceed the fishing level determined by the SSC but catch thresholds can be established that trigger accountability measures to prevent overfishing. Accountability measures might include: (1) seasonal, area, and gear allocations; (2) bycatch limits; (3) closed areas; (4) gear restrictions; (5) limited entry; (6) catch shares; (7) in-season fishery closures; and (8) observer and vessel monitoring requirements.

Accountability measures allow close monitoring of overall catch levels, as well as seasonal and area apportionments. They might close designated areas, or fisheries, if bycatch limits for prohibited species are attained. They also allow monitoring of any endangered or threatened mammals or seabirds and provide a database for evaluating likely consequences of future management actions.

The Council has consistently adopted the annual OFL[1] and ABC recommendations from its SSC and set the TAC for each of its commercial groundfish stocks at or below the respective ABC.

In 1996, the Council capped the rate of F used to calculate ABC by the rate used to calculate OFL. These rates were prescribed through a set of six tiers defining more and more conservative catch levels as the tiers increased. Harvest rates used to establish ABCs were reduced at low stock size levels, thereby allowing rebuilding of depleted stocks. If the biomass of any stock falls below B_{MSY}, or a proxy for B_{MSY}, the F is reduced relative to the stock status.

The Council seeks to maintain a healthy ecosystem to ensure long-term sustainability, therefore, both target and non-target species are regularly assessed and bycatch limits, including PSC[2], are in place to control impacts. Also, Essential Fish Habitat (EFH), defined in MSA as, "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity", are described and evaluated to assure that fishing impacts are not more than minimal or more than temporary. Some areas have been closed to protect spawning stocks, such as the Bogoslof (Area 518), or for protected species, such as, Steller sea lion with areas excluded to fishing around rookeries and haulouts (10 and 20 nm closures).

3.6.1 An overview of the fishery management framework with an organizational plan of the principal management organizations, their roles and responsibilities

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

North Pacific Fishery Management Council (NPFMC; the Council)
The Council is one of eight regional councils established by the MSA as amended 2007 to oversee management of the nation's fisheries. NPFMC management measures for Pacific cod include seasonal and spatial allocation of TAC, time, and area restrictions (e.g., protected/conservation areas), full retention requirements (GOA) PSC limits, reporting and observer requirements. The Council is supported by the Advisory Panel (AP), the members of which represent major segments of the fishing industry; catching and processing, subsistence and commercial fishermen, observers, consumers, environmental / conservation, and sport fishermen. The SSC also supports the Council with advice on scientific and other technical matters. The Committee is composed of scientists in biology, economics, statistics, and social science.

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

---

[1] An Overfishing Limit (OFL) is set at the end of the preceding calendar year on the basis of the most recent stock assessment. For each stock, a determination of status with respect to overfishing is made in-season as the fisheries are monitored to prevent exceeding the TAC. In the event that overfishing is determined to have occurred, an in-season action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to end such overfishing immediately. In 1999, the NPFMC prescribed that OFL should never exceed the amount that would be taken if the stock were fished at FMSY (or a proxy for F_{MSY})

[2] Prohibited Species are species that support traditional, near-shore Alaska fisheries. These species include Pacific halibut, Pacific herring, several species of salmon and large spider crabs in the BSAI management area. The bycatch of PSC species is to be avoided while fishing for groundfish, and by regulation PSC species must be returned to the sea with a minimum of injury, except when their retention is authorized by other law (e.g., donation programs)

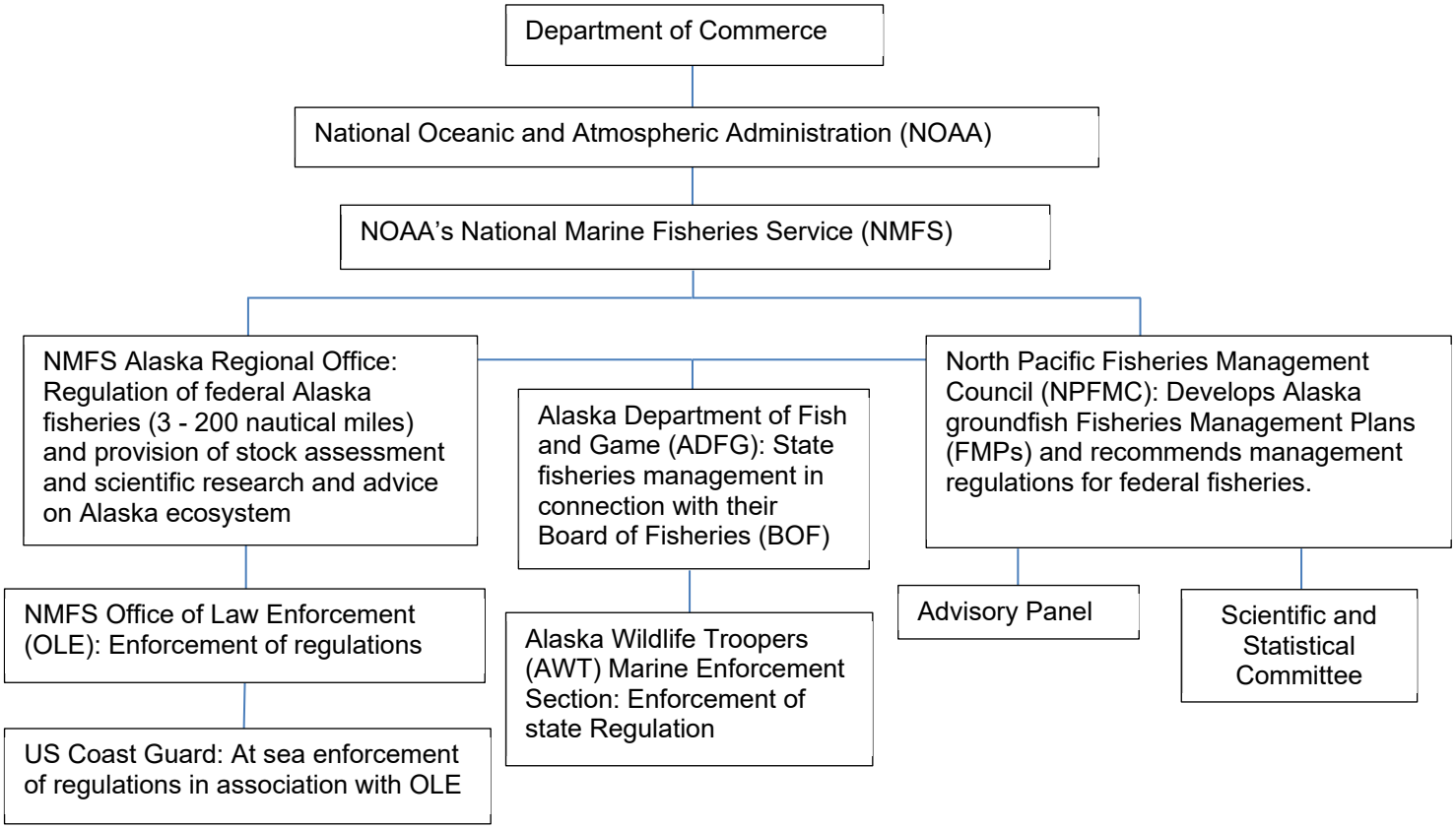

Figure 12. The organizational structure for the management of the Alaska Pacific cod fishery. Source: adapted from original full - assessment report Global Trust 2011

3.6.2 Establishment legislation

Federal

The principle legislative instrument for fisheries management in the US is the MSA (MSA 2007). The MSA contains 10 National Standards, which fishery managers must consider when preparing an FMP or Amendment. These National Standards are:

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

fisheries, fishery resources, and catches;
7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication;
8. Conservation and management measures shall, consistent with the conservation requirements of the Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities;
9. Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch; and,
10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

NMFS implements the MSA and the National Standards. The procedures on how NMFS follows the National Standards are published in the U.S. Federal Register at 50 CFR Part 600 subpart D. The MSA also establishes the Council as one of eight regional councils to manage fisheries in the U.S. EEZ.

State
State waters are fished under State of Alaska commercial fisheries regulations. The General Commercial Fisheries Regulations establishes the basic regulations (i.e., those that give the ADFG and BOF the powers to regulate and manage the state fishery resource and describe the extent of their regulatory powers). Article 5, of the Commercial Groundfish Fisheries Regulations (2020-2021), defines the state-wide groundfish provisions. State-wide regulations 5 AAC 28.086 and 5 AAC 28.087 give the ADFG authority to manage parallel fisheries (those Council groundfish fisheries within state waters) and parallel fisheries with Stellar sea lion restrictions, respectively, incorporating federal/Council regulations within state waters.

3.6.3 Governance procedure

North Pacific Fisheries Management Council (NPFMC)
The Council primarily manages groundfish in the BSAI and GOA, targeting pollock, Pacific cod, flatfish, mackerel, sablefish, and rockfish harvested by trawl, longline, jig, and pot gear (NPFMC 2019a). The Council conducts public hearings so as to allow all interested persons an opportunity to be heard in the development of FMPs and amendments, and reviews and revises, as appropriate, the assessments and specifications with respect to the optimum yield from each fishery (16 U.S.C. 1852(h)). The Council has developed a management policy and objectives to guide its development of management recommendations to the Secretary of Commerce. Other large Alaska fisheries for salmon, crab, and scallops are managed jointly with the State of Alaska. The Council also works very closely with the ADFG and the BOF to coordinate management programs in federal and state waters (0-3 nm from shore). Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the Council and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other.

The process used by the Council for decision-making is described in the Council guide for navigating the Council process (NPFMC 2017) and the Council Operating Procedures (NPFMC 2019b). The following section draws upon these reports.

The North Pacific fisheries comprise numerous species managed under five FMPs: BSAI Groundfish FMP, GOA Groundfish FMP, BSAI King and Tanner Crab FMP; Alaska Scallop FMP; and Alaska Salmon FMP.

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

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

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

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

The Council is supported by two formal advisory groups: the SSC and the AP.

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

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

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

Under MSA, each Council must reflect the expertise and interests of its constituent States, with membership that is knowledgeable about conservation, management, commercial or recreational harvest, of the fishery resources within the council area. The Secretary of Commerce is charged with ensuring each council has membership that fairly represents the commercial and recreational fisheries under that Council's jurisdiction. Each year the Secretary submits a report on Council membership to the Senate Committee on Commerce, Science, and Transportation that list the fisheries under the jurisdiction of each Council and their characteristics, assesses Council membership in terms of the apportionment of the active participants in each Council's fisheries, and states a plan and schedule for actions to achieve a fair and balanced apportionment on each council (MSA 2007).

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

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

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

Each regular Council meeting and, any emergency meeting, is open to the public. Interested persons may present oral or written statements regarding the matters on the agenda at meetings, within reasonable limits established by the Chair. Current Council policy on oral testimony limits individuals to three minutes, and organizations to six minutes, per agenda item. All written information submitted to the Council by an interested person shall include a statement of the source and date of such information. Any oral or written statement shall include a brief description of the background and interests of the person in the subject of the oral or written statement

(NPFMC 2019b).

Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. For those proposals, the Council chooses to pursue, it directs NMFS and/or Council staff to prepare an analysis considering a range of alternatives. The Council reviews the analysis and selects a range of alternatives within which a preliminary preferred alternative may be identified. The analysis is then made available for public review, and the Council makes a final decision at the next meeting. After considering Council recommendations and public comments, NMFS publishes the adopted regulations. For non-routine and annual management decisions, NMFS publishes a Federal Register notice and provides a public comment period before finalizing the recommendations (NPFMC 2019b).

The Council may hold public hearings in order to provide the opportunity for all interested individuals to be heard with respect to the development of fishery management plans or amendments, and with respect to the administration and implementation of other relevant features of the Act. Notice of each hearing must be received by NMFS for publication in the Federal Register at least 23 calendar days prior to the proposed hearing. The Council will also issue notices to announce the time, location, and agenda for each hearing in a manner sufficient to assure all interested parties are aware of the opportunity to make their views known. If it is determined a hearing is appropriate, the Council Chair will designate at least one voting member of the Council to officiate. An accurate record of the participants and their views will be made available to the Council at the appropriate Council meeting and maintained as part of the Council's administrative record (NPFMC 2019b).

The procedure for changing Federal fishing regulations follows a standardized process, set by a combination of laws, regulations, operational guidelines, policies, as well as adjustments and adaptations developed by the Council intended to increase efficiency, provide public participation, and produce quality outcomes (NPFMC 2017, 2019b). All documents are posted on the website in advance of the meeting, and public comment is taken by the Council and advisory bodies before any decisions are made.

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

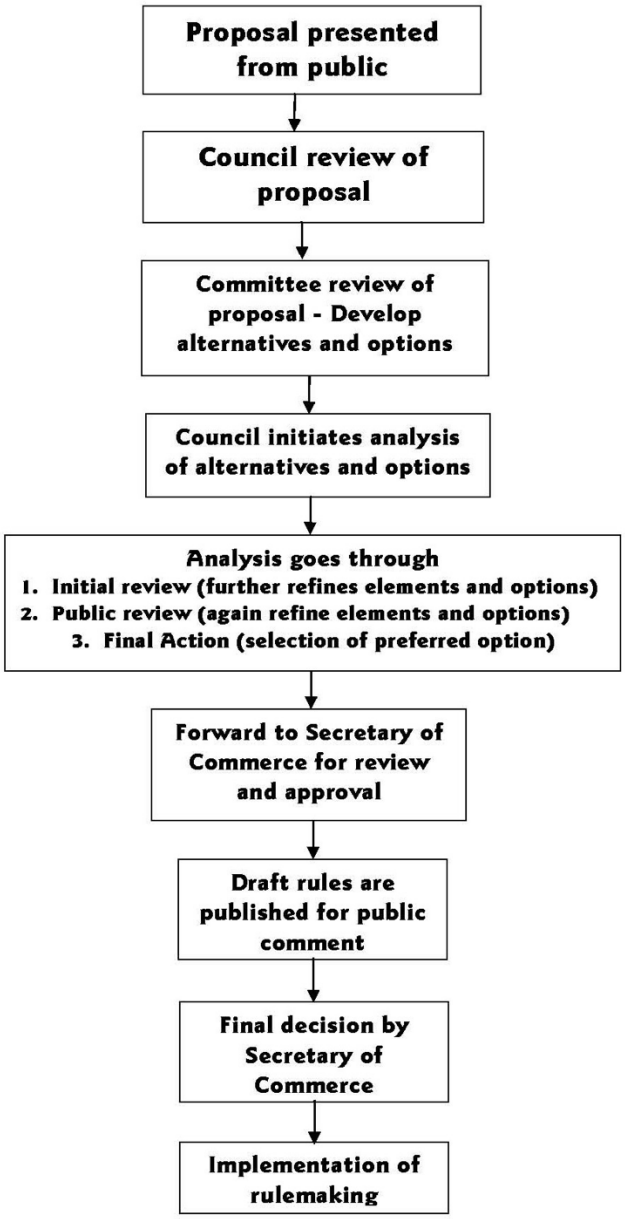

Figure 13. Flow diagram showing the process for regulatory change at the NPFMC. Source: adapted from NPFMC 2019b

A discussion paper is frequently prepared by staff as a first step to flesh out the scope of the problem identified and discuss issues that may be of concern in the development of alternatives. For very complex issues, several discussion papers may be necessary to explore the full scope of an issue before reasonable alternatives can be developed. For relatively simple changes, where the problem and alternatives are self-evident, a discussion paper may not be necessary, and the issue can go straight to analysis, even without developing an official problem statement and range of alternatives. The AP (and other committees if appropriate) provides recommendations to the Council at this stage as to whether the issue should proceed further in the process, if an expanded discussion paper is needed, or if the issue is ready for analysis (and recommends alternatives to be evaluated) (NPFMC 2019b).

The Council usually adopts a problem statement (or thoroughly describes the problem) and identifies alternatives to be considered, and

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

After initial review, staff revise the analysis based on SSC, AP, and Council comments, and the analysis is posted on the Council website about 3 to 4 weeks before the next meeting. The AP makes a recommendation to the Council regarding a preferred alternative. The Council makes a final decision by roll call vote on the motion (NPFMC 2019b).

The NMFS region prepares draft regulations based on Council action, and once cleared by the region and Office of Management Budget, a proposed rule is published in the Federal Register. The public is provided time to comment on the proposed rule (NPFMC 2019b). NMFS region staff summarizes comments and may make adjustments to the rule based on these comments. The response to comments, the revised final rule, and final approval decision is published in the Federal Register (NPFMC 2019b).

Alaska Board of Fisheries (BOF)
The BOF consists of seven members serving three-year terms. Members are appointed by the Governor and confirmed by the Legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership (see Alaska Statute 16.05.221).

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

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

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

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

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

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

3.6.4 Reporting activities

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

3.6.5 Surveillance and enforcement activities

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

OLE protects marine wildlife and habitat by enforcing domestic laws, e.g., Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679] and international agreements (e.g., combating illegal, unreported, unregulated [IUU] fishing through the Joint Statement on Enhanced Fisheries Cooperation between the U.S. and Russia).

The OLE in Alaska focuses on outreach and education programs to help the fishing industry understand the rationale for regulations and prevent or minimize infractions. The OLE publishes a national annual report (OLE 2021a), and the Alaska region submits six monthly reports to the NPFMC (e.g., OLE 2021b).

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

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

If the USCG detects a fisheries infringement, they gather evidence and hand over the investigation to the OLE. The USCG provides reports to each Council meeting (e.g., USCG 2021).

The Pacific cod fishery is considered to be a lower risk fishery, with the potential for halibut bycatch in the trawl and longline fisheries being the main issue, however, voluntary compliance, i.e., recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue. The USCG use a software package (FishTactic) to assess risk of infringements and is used to assist the deployment of vessels and aircraft and target enforcement effort.

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

The Observer Program places all vessels and processors in the groundfish and halibut fisheries off Alaska into one of two observer coverage categories: (1) a full coverage category, and (2) a partial coverage category. Vessels in the full coverage category include:

- catcher/processors
- motherships

- catcher vessels while participating in the BSAI pollock fisheries
- catcher vessels while participating in CDQ groundfish fisheries (except sablefish; and pot or jig gear catcher vessels)
- catcher vessels while participating in the Central Gulf of Alaska Rockfish Program
- inshore processor when receiving or processing BS pollock

Vessels in the partial coverage category include:

- catcher vessels designated on a federal fisheries permit when directed fishing for groundfish in federally managed or parallel fisheries, except those in the full coverage category
- catcher vessels when fishing for halibut IFQ or CDQ
- catcher vessels when fishing for sablefish IFQ or fixed gear sablefish CDQ
- shoreside or stationary floating processor, except those in the full coverage category

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

1. “No Selection pool” – This category applies to all vessels fishing with hook-and- line or pot gear that are less than 40 feet overall length, and all catcher vessels of any length fishing with jig, handline, troll, and dinglebar troll gear.
2. “EM Trip Selection pool” – This category applies to vessels using non-trawl gear in the partial coverage category that have been approved to be in the EM selection pool. Vessels that are approved to participate in the EM selection pool are required to log fishing trips and comply with EM deployment requirements; these vessels are not required to carry an observer. Once NOAA Fisheries approves a vessel for the EM selection pool, that vessel remains in the EM selection pool for the duration of the calendar year.
3. “Observer Trip Selection pool” – This category applies to catcher vessels of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 40 feet overall length.

The primary responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska lies with the Alaska Department of Public Safety, through its Division of Alaska Wildlife Troopers, the division also enforces non-fisheries related regulations passed by the Board of Game). Biologists and other staff of the ADFG sometimes participate in enforcement activities and assist the Wildlife Troopers as needed. Some ADFG field staff have enforcement training and have powers of arrest (ADFG 2022a). The AWT attend the BOF and have an important input in the development of state regulations and legislation.

For fisheries in state waters, landings, buying and production data for Pacific cod are recorded on Department of Fish and Game fish tickets or through the eLandings system (internet-based electronic filing) (ADFG 2022b), and the Commercial Operators Annual report, as required by Alaska Statute 16.05.690, “Record of Purchases” and the Alaska Administrative Code 39.130 “Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements”.

The Council has an established Enforcement Committee (NPFMC 2022a) charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea. The Committee is made up of governmental agencies (including OLE, USCG, ADFG, AWT) and organizations having expertise relating to the enforcement and monitoring of North Pacific groundfish and crab fisheries. Meetings are held on a regular basis, typically in conjunction with regular Council meetings and, are open to the public.

3.7 Key stakeholders

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

3.8 Impacts of fishery on ecosystem

3.8.1 Associated and endangered, threatened, and protected (ETP) species

“The ‘Main’ and ‘Minor’ bycatch classification together makes up 95% of the associated species bycatch profile of a given target fishery. The top 95% is assessed, while the bottom 5% is not assessed. Of the 95% assessed, the top 80% is classified as Main Associated Species Catch, while the bottom 15% is classified as Minor Associated Species Catch” (RFM Guidance to Performance Evaluation

v2.0). Additionally, “ETP species must be acknowledged as such when recognized by national legislation adopted at the state and federal level in Alaska, or when recognized through a binding international agreement. Alternatively, species listed under Appendix 1 of the Convention on International Trade in Endangered Species (CITES) or under the International Union for the Conservation of Nature (IUCN) Redlist and impacted negatively[3] by the fishery (i.e., direct or indirect mortality) shall be assessed as ETP unless it can be proven that their status in Alaska waters is above the point where recruitment is impaired or where other similar proxies indicate that the species is not biologically depleted” (RFM Guidance to Performance Evaluation v2.0).

It is known that certain gear types are more impacting on certain species (e.g., longline are more likely to catch seabirds than demersal trawl). While gear-specific bycatch data are not available (except for seabirds and marine mammals), Clause 4.2 provides details on the observer program and level of coverage.

Table 18 and Table 19 show catch data for the BSAI Pacific cod and GOA Pacific cod fisheries, respectively. None of the species are listed in CITES Appendix 1 or the IUCN Red List; however, the ones labeled as PSC (ETP) are protected by federal management measures limiting bycatch of these species. Also, short-tailed albatross is and ETP species in the BSAI fishery since it is ESA listed. Refer to Key Component D for more details.

[3] “For ETP species, interactions with the stock under consideration shall not cause departure from agreed management measures, such as those designed to allow for species restoration across a given geographical area. In other words, any interaction with or bycatch of ETP species shall be minimal and not considered significant, and/or disruptive in terms of ensuring the effectiveness of agreed management measures set up in order to achieve the management and conservation objectives for the ETP species in question.” (RFM’s Guidance to Performance Evaluation v2.0)

Table 18. Catch data of target, non-target, PSC/ETP, and habitat species for 2017-2021 by the BSAI Pacific cod fishery. Blue = target species, green = main associated species, orange = minor associated species, yellow = PSC/ETP species, purple = habitats. Source: observer data

Species	Target, Main Associated, Minor Associated, Other Bycatch, PSC/ETP, or Habitat	Catch (in metric tons)						Percent of Total Average Catch	Percent of Total Average Bycatch
		2017	2018	2019	2020	2021	Five-Year Average		
Pacific cod	Target	199,842.48	172,936.07	147,896.65	118,673.06	92,089.53	146,287.56	82.34%	NA
Alaska plaice	Other bycatch	67.88	16.74	14.08	34.56	6.06	27.86	0.02%	0.09%
Alaska skate	Major associated	908.08	1,014.16	382.76	1,511.12	1,281.11	1,019.45	0.57%	3.25%
Aleutian skate	Other bycatch	32.34	24.65	3.56	82.69	40.46	36.74	0.02%	0.12%
Arrowtooth flounder	Minor associated	626.32	478.88	147.57	308.21	267.92	365.78	0.21%	1.17%
Atka mackerel	Minor associated	304.22	53.91	2.92	43.47	118.56	104.62	0.06%	0.33%
Auklets*	Other bycatch	35.85	0.00	0.00	0.00	0.00	7.17	NA	NA
Bairdi Tanner Crab*	PSC (ETP)	367,486	273,589	130,586	90,548	43,664	181,174.46	NA	NA
Benthic urochordata	Minor associated	26.00	248.48	49.50	13.41	0.39	67.55	0.04%	0.22%
Big skate	Minor associated	93.39	65.54	39.68	101.30	71.91	74.36	0.04%	0.24%
Bigmouth sculpin	Minor associated	579.15	299.90	86.88	239.80	0.00	241.14	0.14%	0.77%
Birds, unidentified*	Other bycatch	246.54	81.41	190.30	368.75	148.77	207.15	NA	NA
Bivalves	Other bycatch	7.67	3.92	3.86	4.42	1.14	4.20	0.00%	0.01%
Blue King Crab*	PSC (ETP)	37,176	6,161	4,185	1,161	361	9,808.81	NA	NA
Butter sole	Other bycatch	37.87	36.15	47.76	45.48	23.52	38.16	0.02%	0.12%
Chinook salmon*	PSC (ETP)	2,145	1,430	1,458	235	147	1,083.03	NA	NA
Corals bryozoans, unidentified	Habitat	9.01	8.79	7.55	15.42	13.14	10.78	0.01%	0.03%
Dover sole	Other bycatch	0.00	8.32	0.45	0.00	0.00	1.75	0.00%	0.01%
Dusky rockfish	Other bycatch	19.40	16.95	4.36	14.94	32.22	17.57	0.01%	0.06%
Eelpouts	Other bycatch	89.72	51.42	24.18	6.26	6.60	35.64	0.02%	0.11%
Flatfish, unidentified	Minor associated	0.00	0.00	0.00	108.65	143.08	50.35	0.03%	0.16%
Flathead sole	Minor associated	679.75	552.14	518.19	590.06	324.14	532.86	0.30%	1.70%
Flounder, unidentified	Other bycatch	9.15	6.40	3.44	0.00	0.00	3.80	0.00%	0.01%

Giant grenadier	Minor associated	0.00	0.00	143.25	156.73	27.54	65.50	0.04%	0.21%
Golden King Crab*	PSC (ETP)	24,010	3,951	3,409	3,304	25,977	12,130.16	NA	NA
Great sculpin	Minor associated	549.30	616.09	271.73	505.68	0.00	388.56	0.22%	1.24%
Greenland turbot	Minor associated	154.88	103.02	2.14	63.21	11.78	67.01	0.04%	0.21%
Groundfish, unidentified	Other bycatch	52.27	33.41	10.41	0.00	0.00	19.22	0.01%	0.06%
Gulls*	Other bycatch	371.95	510.58	161.76	179.94	142.10	273.27	NA	NA
Hermit crab, unidentified	Other bycatch	2.23	0.74	2.60	1.18	3.90	2.13	0.00%	0.01%
Invertebrate, unidentified	Other bycatch	10.47	4.32	1.99	3.26	0.95	4.20	0.00%	0.01%
Kamchatka flounder	Minor associated	48.76	58.74	12.20	41.90	68.41	46.00	0.03%	0.15%
Kittiwakes*	Other bycatch	12.91	29.70	5.19	20.90	6.14	14.97	NA	NA
Laysan albatross*	Other bycatch	8.76	30.31	10.78	0.00	36.67	17.30	NA	NA
Longnose skate	Other bycatch	0.21	0.99	0.00	2.00	9.21	2.48	0.00%	0.01%
Misc. crabs	Other bycatch	14.60	8.63	4.24	9.84	5.13	8.49	0.00%	0.03%
Misc. fish	Other bycatch	47.32	47.88	31.83	22.17	17.43	33.32	0.02%	0.11%
Murres*	Other bycatch	9.49	0.00	0.00	6.44	7.79	4.74	NA	NA
Non-Chinook salmon*	PSC (ETP)	255	178	494	115	88	226.20	NA	NA
North Pacific octopus	Minor associated	262.73	261.60	153.65	672.32	154.37	300.93	0.17%	0.96%
Northern fulmar*	Other bycatch	3,122.62	2,620.16	2,543.20	2,140.68	778.85	2,241.10	NA	NA
Northern rockfish	Minor associated	67.35	47.58	32.57	63.00	73.12	56.73	0.03%	0.18%
Opilio Tanner Crab*	PSC (ETP)	168,932	67,066	133,665	158,964	87,898	123,305.10	NA	NA
Other alcids*	Other bycatch	0.00	5.29	0.00	0.00	0.00	1.06	NA	NA
Other birds*	Other bycatch	0.00	0.00	0.00	7.50	0.00	1.50	NA	NA
Other large sculpin	Minor associated	992.84	911.62	502.05	1,373.68	0.00	756.04	0.43%	2.41%
Other rockfish	Other bycatch	19.26	13.75	8.15	0.00	0.00	8.23	0.00%	0.03%
Other sculpin	Minor associated	21.08	15.38	10.75	0.00	2,591.95	527.83	0.30%	1.68%
Other skate	Main associated	26,478.13	24,048.18	6,444.70	11,910.94	11,458.80	16,068.15	9.04%	51.21%
Other small sculpin	Other bycatch	0.00	0.00	0.00	18.34	0.00	3.67	0.00%	0.01%

Pacific halibut	PSC (ETP)	2,793.43	1,930.27	472.83	262.08	183.28	1,128.38	0.64%	3.60%
Pacific ocean perch	Other bycatch	48.41	4.89	1.94	14.55	6.47	15.25	0.01%	0.05%
Pacific sleeper shark	Other bycatch	29.00	15.05	6.20	18.26	16.62	17.03	0.01%	0.05%
Plain sculpin	Other bycatch	16.11	20.57	5.05	25.89	0.00	13.52	0.01%	0.04%
Pollock	Main associated	8,364.41	8,067.94	2,637.40	5,585.72	4,375.97	5,806.29	3.27%	18.51%
Rattail grenadier, unidentified	Other bycatch	0.00	0.00	8.87	4.12	0.68	2.73	0.00%	0.01%
Red King Crab*	PSC (ETP)	35,636	337,972	47,951	23,752	296,925	148,447.40	NA	NA
Rex sole	Other bycatch	15.85	11.14	8.66	10.87	5.33	10.37	0.01%	0.03%
Rock sole	Main associated	1,304.86	2,369.67	882.35	411.61	360.80	1,065.86	0.60%	3.40%
Rockfish, unidentified	Other bycatch	0.00	0.00	0.00	53.10	14.68	13.56	0.01%	0.04%
Rougheye rockfish	Other bycatch	59.48	27.81	0.16	56.47	42.97	37.38	0.02%	0.12%
Sablefish	Minor associated	47.06	100.96	22.60	147.28	199.62	103.51	0.06%	0.33%
Scypho jellies	Minor associated	51.16	193.48	80.56	29.30	67.78	84.46	0.05%	0.27%
Sea anemone, unidentified	Minor associated	155.31	104.32	60.66	49.16	21.70	78.23	0.04%	0.25%
Sea pens, whips	Habitat	43.85	17.10	11.36	15.70	5.41	18.69	0.01%	0.06%
Sea star	Minor associated	772.14	318.42	452.98	245.91	207.76	399.44	0.22%	1.27%
Shearwaters*	Other bycatch	1,070.97	584.06	3,441.12	368.91	1,116.10	1,316.23	NA	NA
Shortraker rockfish	Other bycatch	14.51	12.58	0.89	8.18	31.29	13.49	0.01%	0.04%
Short-tailed albatross*	ETP	0	0	0	11	0	2.29	NA	NA
Snails	Minor associated	69.89	44.25	57.79	40.64	70.43	56.60	0.03%	0.18%
Spiny dogfish	Other bycatch	8.91	8.95	2.19	0.91	0.84	4.36	0.00%	0.01%
Sponge, unidentified	Habitat	10.10	16.12	4.94	14.64	6.37	10.43	0.01%	0.03%
Starry flounder	Minor associated	105.12	165.35	115.41	78.53	64.60	105.80	0.06%	0.34%
Thornyhead rockfish	Other bycatch	8.52	6.17	2.04	13.25	18.55	9.71	0.01%	0.03%
Urchins, dollars, cucumbers	Other bycatch	3.04	2.62	1.20	0.99	0.59	1.69	0.00%	0.01%
Warty sculpin	Other bycatch	6.65	4.23	3.39	11.10	0.00	5.07	0.00%	0.02%
Whiteblotched skate	Other bycatch	3.31	6.02	0.22	45.56	21.66	15.35	0.01%	0.05%

Yellow Irish lord	Minor associated	205.65	357.84	156.66	186.98	0.00	181.43	0.10%	0.58%
Yellowfin sole	Main associated	1,793.33	2,491.41	0.00	825.13	773.08	1,176.59	0.66%	3.75%
Total**		247,993.15	218,307.39	161,866.09	144,806.13	115,343.92	177,663.34		

Notes:
Only species with percentage of total average bycatch over 0.00% are shown in table.
* Number of individuals instead of metric tons
** Does not include species with individual numbers instead of weight

Table 19. Catch data of target, non-target, PSC/ETP, and habitat species for 2017-2021 by the GOA Pacific cod fishery. Blue = target species, green = main associated species, orange = minor associated species, yellow = PSC/ETP species, purple = habitats. Source: observer data

Species	Target, Main Associated, Minor Associated, Other Bycatch, PSC/ETP, or Habitat	Catch (in metric tons)						Percent of Total Average	Percent of Total Average Bycatch
		2017	2018	2019	2020	2021	Five-Year Average		
Pacific cod	Target	32,824.34	8,353.42	7,781.58	40.84	8,526.01	11,505.24	80.02%	NA
Alaska skate	Minor associated	1.14	0.07	0.08	0.18	5.31	1.36	0.01%	0.05%
Aleutian skate	Minor associated	18.18	2.11	1.13	0.62	11.31	6.67	0.05%	0.23%
Arrowtooth flounder	Main associated	490.85	109.65	205.76	50.51	148.28	201.01	1.40%	7.00%
Atka mackerel	Main associated	384.09	9.57	33.07	0.00	2.89	85.92	0.60%	2.99%
Bairdi Tanner Crab*	PSC (ETP)	4,895	18,294	29,715	166	30,376	16,689.15	NA	NA
Benthic urochordata	Minor associated	1.50	0.01	0.25	0.00	0.00	0.35	0.00%	0.01%
Big skate	Main associated	619.26	104.39	165.85	3.43	202.50	219.08	1.52%	7.62%
Bigmouth sculpin	Minor associated	17.50	0.36	1.50	0.00	0.00	3.87	0.03%	0.13%
Birds, unidentified*	Other bycatch	0.00	163.89	0.00	0.00	12.34	35.25	NA	NA
Bivalves	Minor associated	1.28	2.82	0.25	0.00	0.00	0.87	0.01%	0.03%
Black-footed albatross*	Other bycatch	27.61	0.00	0.00	0.00	0.00	5.52	NA	NA
Butter sole	Minor associated	11.56	3.91	0.13	0.00	0.07	3.13	0.02%	0.11%
Chinook salmon*	PSC (ETP)	2,137	401	188	0	3,827	1,310.47	NA	NA
Corals bryozoans, unidentified	Habitat	2.33	1.63	1.70	1.36	0.07	1.42	0.01%	0.05%

Dover sole	Minor associated	0.86	0.16	0.00	0.06	1.00	0.42	0.00%	0.01%
Dusky rockfish	Main associated	96.14	7.71	2.31	0.78	4.79	22.35	0.16%	0.78%
English sole	Minor associated	3.44	1.61	3.52	0.06	2.13	2.15	0.01%	0.07%
Flatfish, unidentified	Minor associated	0.00	0.00	0.00	3.31	5.53	1.77	0.01%	0.06%
Flathead sole	Main associated	152.71	29.59	95.43	0.11	20.87	59.74	0.42%	2.08%
Giant grenadier	Main associated	0.00	0.00	0.13	0.00	79.55	15.94	0.11%	0.55%
Golden King Crab*	PSC (ETP)	20	2	25	22	26	19.18	NA	NA
Great sculpin	Main associated	323.66	19.11	5.30	0.01	0.00	69.62	0.48%	2.42%
Greenland turbot	Minor associated	6.56	0.01	0.00	0.00	0.00	1.31	0.01%	0.05%
Greenlings	Minor associated	5.83	0.89	0.82	0.00	0.47	1.60	0.01%	0.06%
Gulls*	Other bycatch	57.82	213.41	34.90	0.00	10.74	63.37	NA	NA
Harlequin rockfish	Minor associated	0.64	0.31	0.00	0.00	0.00	0.19	0.00%	0.01%
Hermit crab, unidentified	Minor associated	0.12	0.09	0.92	0.00	0.01	0.23	0.00%	0.01%
Invertebrates, unidentified	Minor associated	0.23	0.08	0.08	0.86	0.01	0.25	0.00%	0.01%
Kamchatka flounder	Minor associated	11.80	0.04	0.10	0.00	0.15	2.42	0.02%	0.08%
Longnose skate	Main associated	405.84	86.78	58.63	5.90	121.73	135.78	0.94%	4.73%
Misc. crabs	Minor associated	0.80	0.42	0.14	0.00	0.14	0.30	0.00%	0.01%
Misc. fish	Main associated	169.25	30.08	15.97	0.00	35.14	50.09	0.35%	1.74%
Non-Chinook salmon*	PSC (ETP)	119	5	5	1	0	25.89	NA	NA
North Pacific octopus	Main associated	223.21	151.96	80.69	12.04	37.70	101.12	0.70%	3.52%
Northern fulmar*	Other bycatch	146.67	14.75	0.00	0.00	24.69	37.22	NA	NA
Northern rockfish	Main associated	54.52	5.07	1.15	0.00	4.42	13.03	0.09%	0.45%
Opilio Tanner Crab*	PSC (ETP)	2	0	0	9	0	2.26	NA	NA
Other flounder	Minor associated	1.45	0.11	0.00	0.00	0.00	0.31	0.00%	0.01%
Other groundfish	Minor associated	2.90	4.22	0.16	0.00	0.00	1.46	0.01%	0.05%
Other large sculpins	Main associated	179.22	54.40	34.26	0.34	0.00	53.64	0.37%	1.87%
Other rockfish	Minor associated	15.79	5.22	0.30	0.00	0.00	4.26	0.03%	0.15%

Other sculpin	Main associated	3.50	0.43	0.24	0.00	124.36	25.70	0.18%	0.89%
Other shark	Other bycatch	0.00	0.00	0.00	0.00	0.59	0.12	0.00%	0.00%
Other skate	Main associated	979.61	204.34	88.29	2.65	278.25	310.63	2.16%	10.81%
Pacific halibut	ETP	1,777.87	404.91	97.26	5.87	122.73	481.73	3.35%	16.76%
Pacific herring	PSC (ETP)	0.01	0.01	0.06	0.01	0.00	0.02	0.00%	0.00%
Pacific ocean perch	Main associated	77.26	2.71	0.41	7.76	1.72	17.97	0.12%	0.63%
Pacific sleeper shark	Minor associated	8.00	12.89	1.92	0.20	0.62	4.73	0.03%	0.16%
Pollock	Main associated	830.65	108.48	91.42	15.69	293.53	267.96	1.86%	9.33%
Quillback rockfish	Minor associated	13.10	3.61	5.44	0.34	7.09	5.92	0.04%	0.21%
Red King Crab*	PSC (ETP)	0	0	0	0	23	4.58	NA	NA
Redbanded rockfish	Minor associated	3.51	1.02	0.16	0.33	0.04	1.01	0.01%	0.04%
Rex sole	Main associated	19.07	5.85	27.73	0.15	1.65	10.89	0.08%	0.38%
Rock sole	Main associated	815.85	41.01	41.75	0.03	16.19	182.97	1.27%	6.37%
Rockfish, unidentified	Minor associated	0.00	0.00	0.00	0.06	7.34	1.48	0.01%	0.05%
Rougheye rockfish	Minor associated	16.23	9.57	1.19	0.15	3.34	6.10	0.04%	0.21%
Sablefish	Main associated	113.60	62.64	4.82	5.32	141.41	65.56	0.46%	2.28%
Scypho jellies	Minor associated	0.89	0.00	2.65	0.15	0.19	0.78	0.01%	0.03%
Sea anemone, unidentified	Minor associated	13.35	2.53	1.39	0.00	1.17	3.69	0.03%	0.13%
Sea pens, whips	Habitat	0.59	0.41	0.51	0.00	0.02	0.31	0.00%	0.01%
Sea star	Main associated	383.77	40.05	41.52	12.65	18.92	99.38	0.69%	3.46%
Shearwaters*	Other bycatch	0.00	6.74	0.00	0.00	0.00	1.35	NA	NA
Shortraker rockfish	Minor associated	8.61	10.67	0.38	0.07	4.92	4.93	0.03%	0.17%
Silvergray rockfish	Minor associated	1.14	0.74	0.22	0.00	0.31	0.48	0.00%	0.02%
Snails	Minor associated	9.61	6.79	4.78	0.47	0.27	4.38	0.03%	0.15%
Spiny dogfish	Main associated	356.43	117.29	167.22	12.84	186.52	168.06	1.17%	5.85%
Sponge, unidentified	Habitat	2.63	2.29	5.88	0.00	0.05	2.17	0.02%	0.08%
Starry flounder	Minor associated	6.23	0.18	0.07	0.00	0.20	1.34	0.01%	0.05%

State-managed rockfish	Main associated	75.50	3.50	3.54	0.00	2.58	17.02	0.12%	0.59%
Thornyhead rockfish	Main associated	36.08	2.60	0.04	0.02	0.96	7.94	0.06%	0.28%
Tiger rockfish	Minor associated	0.58	0.09	0.16	0.00	0.33	0.23	0.00%	0.01%
Urchins, dollars, cucumbers	Minor associated	4.57	0.39	0.32	0.00	0.03	1.06	0.01%	0.04%
Whiteblotched skate	Minor associated	0.74	0.01	0.00	0.01	0.00	0.15	0.00%	0.01%
Yellow Irish lord	Main associated	398.44	24.05	20.18	0.22	0.00	88.58	0.62%	3.08%
Yelloweye rockfish	Main associated	84.49	22.91	10.91	0.33	13.89	26.51	0.18%	0.92%
Yellowfin sole	Minor associated	1.70	4.57	0.12	0.00	0.52	1.38	0.01%	0.05%
Total**		42,071.48	10,083.02	9,113.07	185.98	10,440.06	14,378.72		

Notes:
Only species with percentage of total average over 0.00% are shown in table.
* Number of individuals instead of metric tons
** Does not include species with individual numbers instead of weight

3.8.2 Habitats

The BSAI and GOA are extremely large areas, making comprehensive habitat mapping difficult. Habitat has been mapped at a level of 5 km^2 grids, and while this level is likely under sampling habitat, the data provide an idea of what is occurring on the seafloor (Figure 14). Figure 15, Figure 16, and Figure 17 show the percentage of area within each grid cell that has been disturbed (2003-2017) for BS, AI, and GOA, respectively. Figure 14 shows a high occurrence of mud and sand and lesser amounts of gravel, cobble, and boulders.

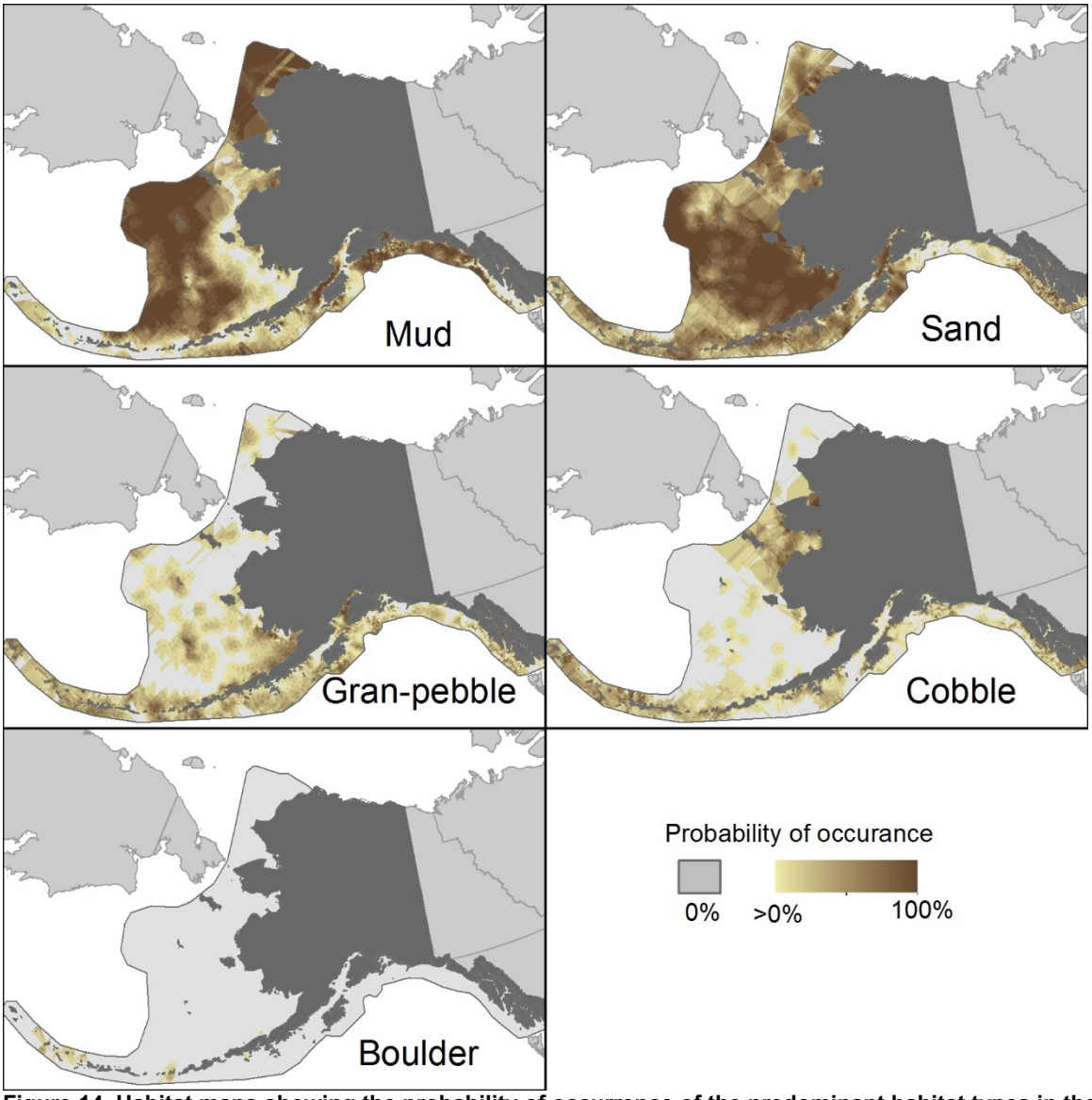

Figure 14. Habitat maps showing the probability of occurrence of the predominant habitat types in the BSAI and GOA. Source: NOAA

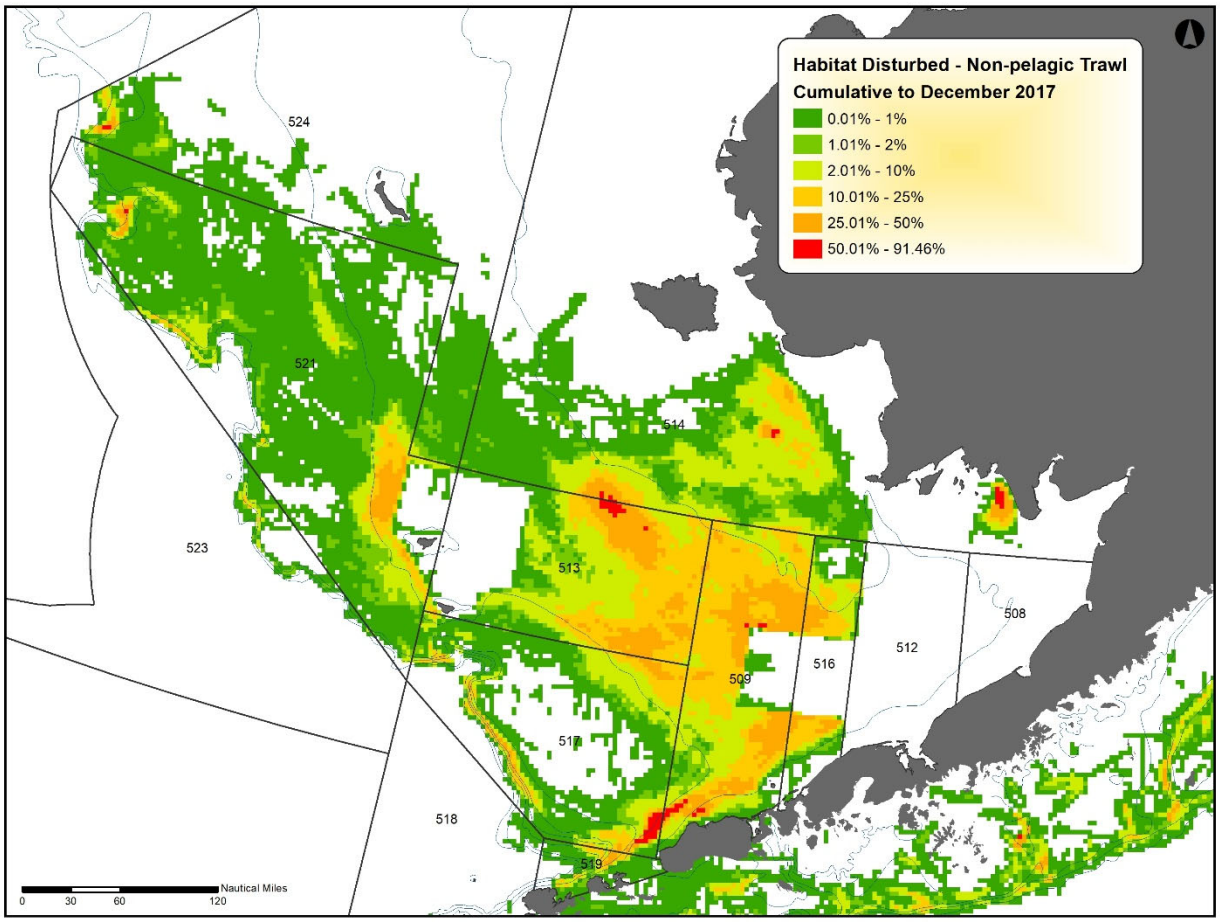

Figure 15. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the BS. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

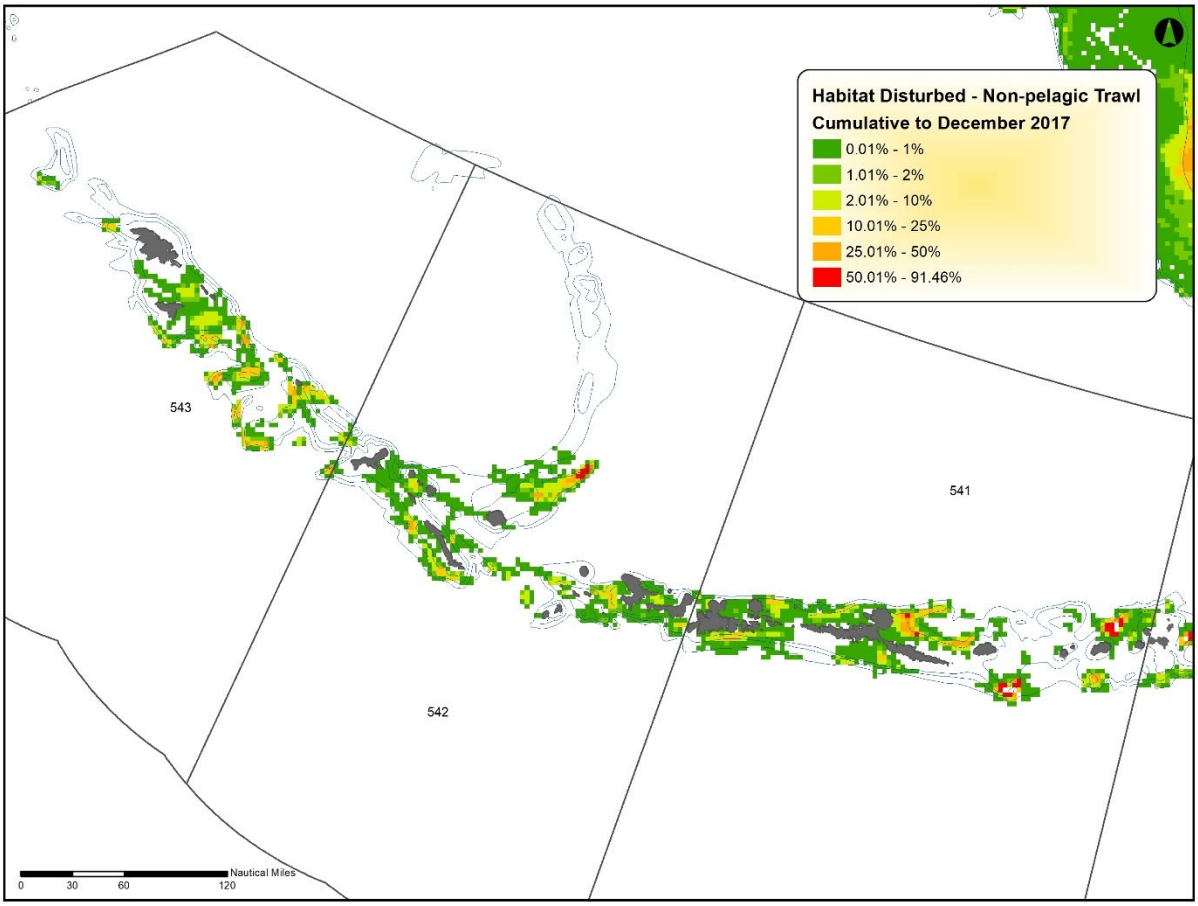

Figure 16. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the AI. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

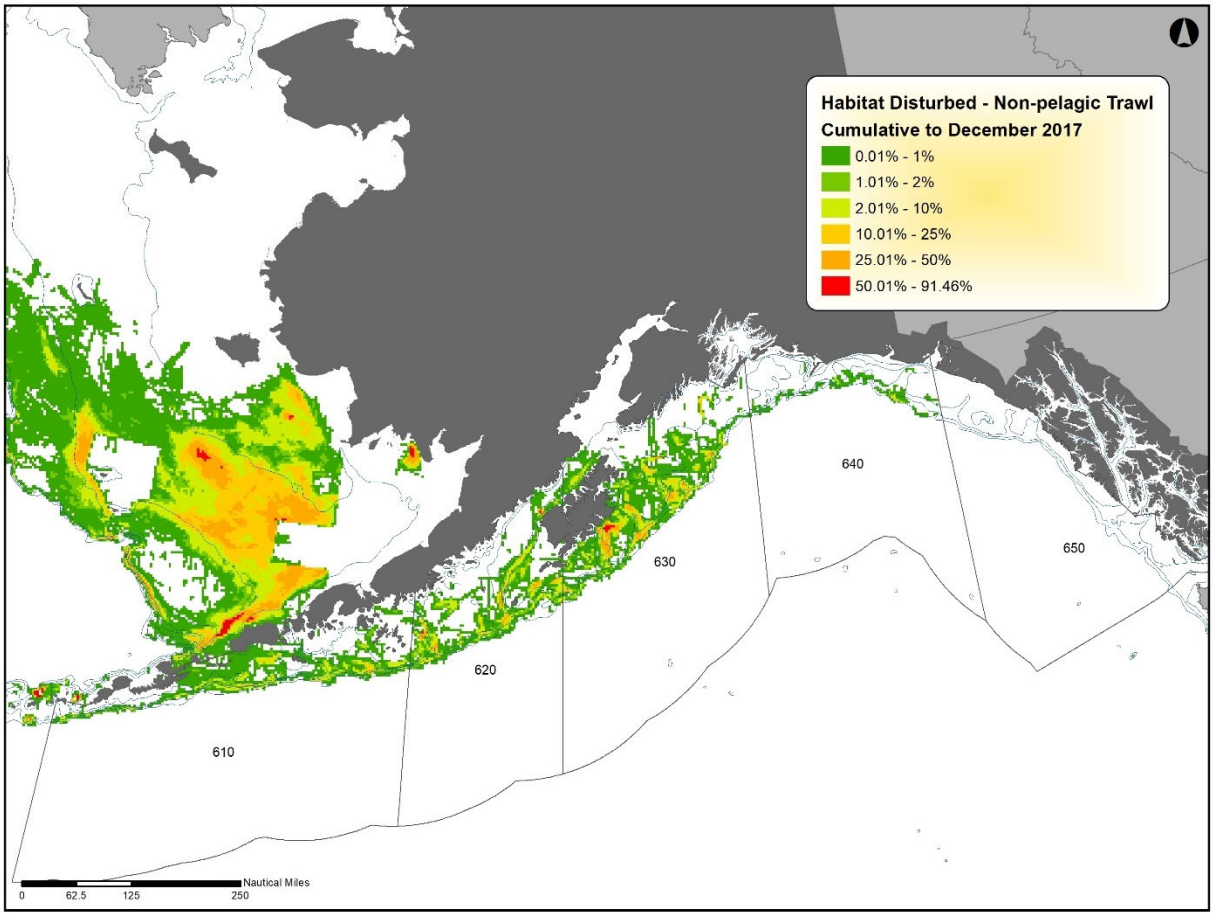

Figure 17. Percentage of area disturbed, 2003-2017, by bottom trawl gear in the GOA. Effects are cumulative and consider impact on and recovery of relevant features. Source: NOAA

3.8.2.1 EBS

The EBS seafloor is a mixture of mud (clay and silt), sand, and gravel with sand and silt being the primary components over most of the seafloor. Sand dominates in waters <60 m deep. The proportions of finer-grade sediments increase with increasing depth and distance from shore. This grading is most noticeable on the southeastern BS continental shelf in Bristol Bay and immediately westward. Generally, nearshore sediments in the east and southeast on the inner shelf (0-50 m depth) are sandy gravel and gravelly sand, giving way to plain sand farther offshore and west. On the middle shelf (50-100 m), sand transitions to muddy sand and sandy mud, continuing over much of the outer shelf (100-200 m) to the start of the continental slope. On the central and northeastern shelf (including Norton Sound), sediment has not been as extensively mapped, and although sand appears dominant, there are areas of silt concentration in shallow nearshore waters and in deep areas near the shelf slope due to the large input of fluvial silt from the Yukon River and northerly current (NPFMC 2018a).

3.8.2.2 AI

The AI is the tip of a submerged volcanic mountain chain that stretches about 2,260 km forming a partial geographic barrier to the exchange of northern Pacific marine waters with EBS waters. The AI continental shelf is narrow compared with the EBS shelf, ranging in width from about 4 km or less to 42-46 km north to south. The shelf broadens on the eastern portion of the AI arc. Bathymetry changes dramatically over short distance, from the depths of the Aleutian Trench (>7,000 m deep) to sea level. Unlike the soft bottom

sediments of the BS, bottom habitats are highly complex, with primarily rough, rocky bottom (rock, boulders, and corals) steep slopes and drop-offs, and few areas of fine sediments. Two distinct bottom-type zones are evident. East of Samalga Pass, the AI rises from shallow continental shelf covered by glacial deposits, whereas west of Samalga, steep rocky slopes to the north and south surround a mostly submerged mountain range resting on the Aleutian ridge (NPFMC 2018a).

3.8.2.3 GOA

The GOA seafloor includes gravel, silty mud, and muddy to sandy gravel, as well as areas of boulders and hardrock. The shelf, between Cape Cleare (148° W) and Cape Fairweather (138° W), is relatively wide (up to 100 km). The dominant shelf sediment is clay silt, which comes primarily from either the Copper River or the Bering and Malaspina glaciers. Sand dominates the nearshore areas. Most of the western GOA shelf (west of Cape Igvak) consist of steep and sharply dissected slopes. The shelf is made up of several banks and reefs with coarse rocky bottoms and patchy bottom sediments. Near Kodiak Island, the shelf is flat with relatively shallow banks cut by transverse troughs of bedrock outcrops and coarsely fragmented sediment interspersed with sandy bottoms (NPFMC 2018b).

3.8.2.4 Vulnerable habitats

Table 18 and Table 19 show catch data for the BSAI Pacific cod and GOA Pacific cod fisheries, respectively. Corals, sea pens and whips, and sponges are caught in the BSAI and GOA fisheries. Refer to Key Component D for more details.

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

The effects of environmental variation on production of Pacific cod in the BSAI and GOA have been studied extensively in terms of physical oceanography, ecosystem variability, and fish production. NMFS and the regional offices coordinate the production of a vast amount of new environmental and other information expected to improve groundfish fishery management in Alaska. Several ecosystem-wide oceanographic phenomena have been identified. The Pacific Decadal Oscillation, with decadal changes in ‘warm’ and ‘cold’ phases has been correlated with a number of factors, including sea level pressure, precipitation, and salmon landing in the Pacific Ocean (https://www.fisheries.noaa.gov/feature-story/understanding-ocean-changes-and-climate-just-got-harder).

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

Past conditions have been an unusually warm phase. In 2014-2016, sea surface temperatures were as much as 3° C (about 5.4° F) higher than average, lasted for months, and appeared on large-scale temperature maps as a red-orange mass of warm water many hundreds of miles across (aka ‘the blob’). This appeared to be different from normal patterns of ocean conditions, such as the El Niño Southern Oscillation or the Pacific Decadal Oscillation (Figure 18). Starting in 2020, sea surface temperatures may be getting closer to normal.

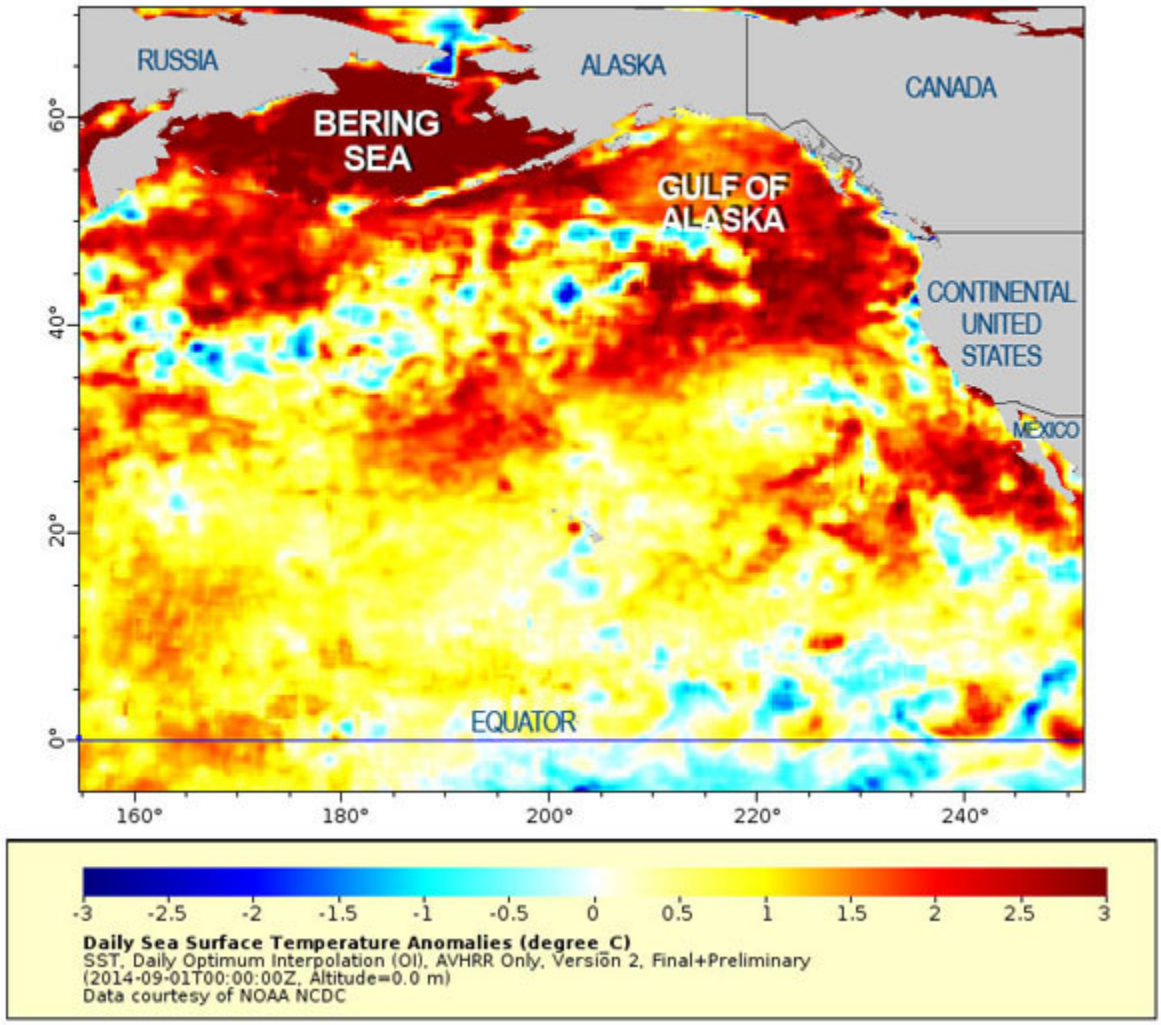

Figure 18. Daily Sea Surface Temperature Anomalies (degree C). Unusually warm temperatures dominate three areas of the North Pacific: the BS, GOA, and an area off Southern California. The darker the red, the further above average the sea surface temperature. Source: https://www.fisheries.noaa.gov/feature-story/unusual-north-pacific-warmth-jostles-marine-food-chain

An unusual physical characteristic of the BS is the annual ice cover. In summer, the ice edge retreats into the Chukchi and Beaufort Seas whereas, in winter, typically much of the shelf is covered. The sea ice affects exchanges with the atmosphere and inhibits the transfer of freshwater and heat. The creation and melting of the sea ice alter the horizontal and vertical density gradients influencing the mixing and transport of nutrients and organisms within the euphotic zone. The ice edge also serves as both source and sink of freshwater that can affect productivity. Sea ice is also important in influencing bottom temperatures. Thus, the extent of sea ice is related to the distribution and abundance of temperature-sensitive bottom-dwelling species. In recent years, there has been an extreme decrease in sea ice, which has likely had an effect on several species' survivability and reproductive success (Siddon 2021).

4 ASSESSMENT PROCESS

This assessment evaluates the Alaska Pacific cod fishery against the conformance criteria outlined in the RFM's Fishery Standard v2.1, which contains clauses that are categorized into four key components:

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

Scoring of each clause is based on a series of Evaluation Parameters: Process, Current Status/Appropriateness/Effectiveness, and Evidence Basis. The scoring guidelines, which are used for all clauses, are as follows:

- If all Evaluation Parameters are satisfied, the clause is scored in full conformance.
- If any single Evaluation Parameter is not satisfied, the clause is scored in minor non-conformance.
- If any two Evaluation Parameters are not satisfied, the clause is scored in major non-conformance.
- If any three or more Evaluation Parameters are not satisfied,the clause is scored in critical non-conformance.

The fishery is assigned a confidence rating for each clause, which signifies the confidence of the assessment team that the fishery is demonstrated to be in conformity to the requirements of that clause. Clauses are scored according to the following confidence ratings:

- Low confidence rating (critical non-conformance level) – Information and/or evidence is completely absent or contradictory to whether an element of the fishery complies with the given requirements of a supporting clause. In these cases, a low confidence rating, equivalent to a critical non-conformance, is assigned.
- Medium confidence rating (major non-conformance) – Information and/or evidence is limited. In these cases, major improvement is needed to achieve full conformance, and a medium confidence rating with a major non-conformance is assigned.
- Medium confidence rating (minor non-conformance) – Information and/or evidence is broadly available; however, there are some information gaps. In these cases, minor improvement is needed to achieve full conformance, and a medium confidence rating with a minor non-conformance is assigned.
- High confidence rating (full conformance) – Sufficient information and/or evidence is available to demonstrate full conformance. In these cases, a high confidence rating is assigned.

Any one major non-conformance or three minor non-conformances assigned to any Section will result in a critical non-conformance at the section level. A critical non-conformance for any clause or section will stop the assessment (i.e., the fishery will not reach the next stage, the Peer Review Stage) unless the fishery is able to provide additional information/evidence that demonstrates no critical non-conformance for any clause or section. The assessment will also be stopped prior to the Peer Review Stage if a fishery is assigned four or more major non-conformances or 12 or more minor non-conformances in total. All non-conformances shall be addressed through the issuance of corrective action plans, which are reviewed and accepted by the assessment team, prior to the fishery progressing to the Peer Review Stage.

4.1 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 December 6, 2011. 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 reassessment against a newer version of the standard, v1.3. The 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 January 2021, the fourth surveillance of the recertification took place via an off-site surveillance audit, which was done in conjunction with the reassessment site visit, and the surveillance report was issued on May 27, 2022. Following the results of the fourth 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. Due to extenuating circumstances, DNV requested a certificate extension. The certificate now expires on February 5, 2023.

4.2 Stakeholder input

The reassessment audit for this fishery was publicly announced on December 14, 2021. Due to the ongoing Covid-19 pandemic, an on-site audit was not feasible. Table 20 provides the agenda and list of participants. (Note that the site visit was held in conjunction with the fourth surveillance audit for this fishery and the Alaska Pacific cod fishery, as well as audits for other fisheries against the RFM and MSC Standards.) The assessment team received no written stakeholder input before or during the site visit.

Table 20. Alaska Pacific cod 4th surveillance audit and reassessment site visit agenda and participants

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) Jodi Bostrom (DNV)	9-10 am

		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) Tommy Sheridan (AFDF)	10 am-12 pm

		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 ASSESSMENT OUTCOME / SCORING OF THE FUNDAMENTAL CLAUSES

According to the RFM Standard Version 2.1, the following fisheries management issues would cause a fishery to fail assessment:

- Dynamiting, poisoning, and other comparable destructive fishing practices.
- IUU fishing activities in the country jurisdiction.
- Shark finning (i.e., removal and retention of shark fins while the remainder of the shark is discarded in the ocean).
- Slavery and slave labor on board fishing vessels.
- Any significant lack of compliance with the requirements of an international fisheries agreement to which the United States is signatory. A fishery will have to be formally cited by the international governing body that has competence with the international treaty in question and that the United States has been notified of that citation of non-compliance.

There is no evidence that the fishery under assessment has undertaken such practices or has been non-compliant. Further, Table 21 shows the scores for each supporting clause for the Alaska Pacific cod fishery.

Table 21. Scoring table

Key Component	Fundamental Clause	Supporting Clause	Applicable?	Score	Confidence Rating	Conformance Level	NC Number
A – Fisheries Management System	1	1.1	Yes	10	High	Full	
		1.2	Yes	10	High	Full	
		1.2.1	Yes	10	High	Full	
		1.3	Yes	10	High	Full	
		1.3.1	No	NA	NA	NA	
		1.4	No	NA	NA	NA	
		1.4.1	No	NA	NA	NA	
		1.5	No	NA	NA	NA	
		1.6	Yes	10	High	Full	
		1.6.1	No	NA	NA	NA	
		1.7	Yes	10	High	Full	
		1.8	Yes	10	High	Full	
		1.9	No	NA	NA	NA	
B – Science, Stock Assessment Activities, and the Precautionary Approach	2	2.1	Yes	10	High	Full	
		2.1.1	Yes	10	High	Full	
		2.1.2	Yes	10	High	Full	
		2.2	Yes	10	High	Full	
		2.3	Yes	10	High	Full	
		2.4	Yes	10	High	Full	
		2.5	Yes	10	High	Full	
		2.6	Yes	10	High	Full	
		2.7	Yes	10	High	Full	
	3	3.1	Yes	7	Medium	Minor NC	1
		3.1.1	Yes	10	High	Full	
		3.1.2	Yes	10	High	Full	
		3.1.3	Yes	10	High	Full	
		3.2	No	NA	NA	NA	
		3.2.1	Yes	10	High	Full	
		3.2.2	Yes	10	High	Full	
		3.2.3	Yes	10	High	Full	
		3.2.4	Yes	10	High	Full	
	4	4.1	Yes	10	High	Full	
		4.1.1	Yes	10	High	Full	
		4.1.2	Yes	10	High	Full	

		4.2	Yes	10	High	Full	
		4.2.1	Yes	10	High	Full	
		4.3	Yes	10	High	Full	
		4.4	Yes	10	High	Full	
		4.5	Yes	10	High	Full	
		4.6	Yes	10	High	Full	
		4.7	Yes	10	High	Full	
		4.8	Yes	10	High	Full	
		4.9	No	NA	NA	NA	
		4.10	No	NA	NA	NA	
		4.11	No	NA	NA	NA	
	5	5.1	Yes	10	High	Full	
		5.1.1	Yes	10	High	Full	
		5.1.2	Yes	10	High	Full	
		5.2	Yes	10	High	Full	
		5.3	Yes	10	High	Full	
		5.4	Yes	10	High	Full	
		5.5	Yes	10	High	Full	
	6	6.1	Yes	10	High	Full	
		6.2	Yes	10	High	Full	
		6.3	Yes	10	High	Full	
		6.4	Yes	10	High	Full	
		6.5	Yes	10	High	Full	
	7	7.1	Yes	10	High	Full	
		7.1.1	Yes	10	High	Full	
		7.1.2	Yes	10	High	Full	
		7.2	No	NA	NA	NA	
C – Management Measures, Implementation, Monitoring, and Control	8	8.1	Yes	10	High	Full	
		8.1.1	Yes	10	High	Full	
		8.1.2	Yes	10	High	Full	
		8.2	Yes	10	High	Full	
		8.3	Yes	10	High	Full	
		8.4	Yes	10	High	Full	
		8.4.1	Yes	10	High	Full	
		8.5	Yes	10	High	Full	
		8.5.1	Yes	10	High	Full	
		8.6	Yes	10	High	Full	
		8.7	Yes	10	High	Full	
		8.8	Yes	10	High	Full	
		8.9	Yes	10	High	Full	
		8.10	No	NA	NA	NA	
		8.11	Yes	10	High	Full	
		8.12	Yes	10	High	Full	
		8.13	No	NA	NA	NA	
	9	9.1	Yes	10	High	Full	
		9.2	Yes	10	High	Full	
		9.3	Yes	10	High	Full	
	10	10.1	Yes	10	High	Full	
		10.2	Yes	10	High	Full	

		10.3	No	NA	NA	NA	
		10.3.1	No	NA	NA	NA	
		10.4	No	NA	NA	NA	
		10.4.1	No	NA	NA	NA	
	11	11.1	Yes	10	High	Full	
		11.2	Yes	10	High	Full	
		11.3	Yes	10	High	Full	
		11.4	No	NA	NA	NA	
D – Serious Impacts of the Fishery on the Ecosystem	12	12.1	Yes	10	High	Full	
		12.2	No	NA	NA	NA	
		12.2.1	Yes	10	High	Full	
		12.2.2	Yes	10	High	Full	
		12.2.3	Yes	10	High	Full	
		12.2.4	Yes	10	High	Full	
		12.2.5	Yes	10	High	Full	
		12.2.6	Yes	10	High	Full	
		12.2.7	Yes	10	High	Full	
		12.2.8	Yes	10	High	Full	
		12.2.9	Yes	10	High	Full	
		12.2.10	Yes	10	High	Full	
		12.2.11	Yes	10	High	Full	
		12.3	Yes	10	High	Full	
		12.4	Yes	10	High	Full	
		12.5	Yes	10	High	Full	
		12.6	Yes	10	High	Full	
		12.7	Yes	10	High	Full	
	13	13.1	No	NA	NA	NA	
		13.1.1	No	NA	NA	NA	
		13.2	No	NA	NA	NA	
		13.2.1	No	NA	NA	NA	
		13.3	No	NA	NA	NA	
		13.4	No	NA	NA	NA	
		13.5	No	NA	NA	NA	
		13.6	No	NA	NA	NA	
		13.7	No	NA	NA	NA	
		13.7.1	No	NA	NA	NA	
		13.7.2	No	NA	NA	NA	
		13.7.3	No	NA	NA	NA	
		13.8	No	NA	NA	NA	
		13.9	No	NA	NA	NA	
		13.10	No	NA	NA	NA	
		13.11	No	NA	NA	NA	
		13.12	No	NA	NA	NA	

A. The Fisheries Management System

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

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

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

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

Evaluation Parameters

Process: *Management agencies are physically and legally established at international, State and l levels.*

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

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an effective legal and administrative framework established at the local and national level is appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate in compliance with the requirements of local, national, and international laws and regulations, including the requirements of any regional fisheries management agreement. Examples may include fishery management plans or other relevant information.*

Evaluation (per parameter)

Process:
The MSA (2007) is the primary law governing marine fisheries management in US federal waters. The MSA, sets 10 National Standards for fishery conservation and management (16 U.S.C. § 1851).

NMFS implements the MSA. NMFS is an office of NOAA within the Department of Commerce is also referred to as NOAA Fisheries.

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

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

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

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

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

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

Current Status/Appropriateness/Effectiveness:
The Council annually prepares and submits to the Secretary of Commerce for approval, FMPs, and any necessary amendments for each fishery under its authority that requires conservation and management actions. The Council primarily manages groundfish in the BSAI (NPFMC 2020a) and GOA (NPFMC 2020b), targeting Pacific cod, pollock, flatfish, mackerel, sablefish, and rockfish species.

The Council recommends regulations to govern the directed Pacific cod fisheries in the Alaska EEZ. Council management measures for Pacific cod include seasonal and spatial allocation of TAC (see Section 3.1.2.3), time and area restrictions (i.e., protected / conservation areas), bycatch reduction programs, PSC limits, reporting and observer requirements (NPFMC 2020a, b).

NMFS is charged with carrying out the federal mandates of the U.S. Department of Commerce with regard to commercial fisheries such as approving and implementing FMPs and FMP amendments recommended by the Council. The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nm).

OLE partners the U.S. Coast Guard in the monitoring, control, and enforcement of fisheries regulations.

OLE protects marine wildlife and habitat by enforcing domestic laws (e.g., federal fisheries regulations for fisheries within the U.S. EEZ [50 CFR 679]) and international agreements (e.g., combating IUU fishing in line with the UN agreement to promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas).

The USCG objectives are to prevent encroachment into the U.S. EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of responsibility within the USCG. If the USCG detects a fisheries infringement, they gather evidence and hand over the investigation to the OLE.

The Observer Program is an important component of the monitoring of the Pacific cod fisheries. The program is the main data-gathering program for all biological and fishery data that feed into Pacific cod stock assessment and management. While observers are not directly part of the federal MCS program they are required to report infringements. OLE and USCG officers conduct de-briefing interviews with observers, checking on vessels fishing practices and the conduct of the crew.

As outlined in the current groundfish FMPs for BSAI and GOA (NPFMC 2020a, b), scientists from the AFSC, ADFG, other agencies, and universities prepare a SAFE report annually. In addition to stock survey, stock assessment reports and biological studies related to the Pacific cod fisheries, the NMFS also has a well-established institutional framework for research and stock assessment developed within the AFSC. Trawl surveys have been conducted annually by NMFS-AFSC to assess the abundance of crab and groundfish in the EBS since 1982 using standardized gear and methods on two chartered commercial fishing vessels. For Pacific cod, this survey provides an important abundance and biomass index as well as information on the population age structure and various biological aspects. Trawl surveys have also been conducted by NMFS-AFSC since 1984 to assess the abundance of groundfish in the GOA. Starting in 2001, the survey frequency was increased from once every three years to every second year. The survey is conducted from chartered commercial bottom trawlers.

In Alaskan state waters (within 3 nm of the shoreline), there are 8 state-managed Pacific cod fisheries (Figure 3): Kodiak, Chignik, South Alaska Peninsula, Aleutian Islands, Southeast Alaska, Prince William Sound, Cook Inlet, and Dutch Harbor. 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 the ABC for the Aleutian Islands) (see Section 3.1.2.3). They are open to pot and jig gear (plus, longline in Prince William Sound and longline and trawl in the Aleutian Islands). Gear is limited to 60 pots or 5 jig machines. The fishery is open access but has exclusive registration and has no observer requirements.

Enforcement of state waters regulations is provided by the Marine Enforcement Section of the AWT. AWT conduct at-sea and shore-based inspections and collate and present evidence of breeches in regulations.

Evidence Basis:
The respective websites for NMFS (NOAA fisheries), NPFMC, ADFG, OLE, AWT, USCG, and annual FMPs for BSAI (NPFMC 2020a) and GOA (NPFMC 2020b).

References:

NPFMC 2019a, BSAI Pacific cod Allocation Review https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Pcod/BSAIPcodAllocationReview2019.pdf

ADFG 2022c. General Commercial Fisheries Regulations http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/statutes_general_provisions_2013-2014.pdf
NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
US Federal Register at 50 CFR Part 600 subpart D https://www.law.cornell.edu/cfr/text/50/part-600/subpart-D

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

1.2 Management measures shall consider (1) stock status (i.e., overfished, biomass) and genetic diversity (stock structure) over its entire area of distribution, and (2) other biological characteristics of the fish stock (stock) including age of maturity and reproductive potential.

FAO Eco (2009) 30.3
FAO Eco (2011) 37.3

Evaluation Parameters

Note on consideration of biological unity and other biological characteristics: *Biological characteristics shall be interpreted as relating to the stability or resilience of the stock—i.e., its ability to recover from or resist a shock or disturbance, such as the impact of*

a fishery. The management system must consider the relative ability of the stock to recover from or resist potential adverse impacts. Characteristics considered shall include growth, fecundity, reproduction, lifespan, spawning cycle, population dynamics, impact of gear type, and essential habitat(s) needs and availability. Where life cycle and other biological characteristics are unknown, the management system shall ensure these uncertainties are factored into assessment and managing practices, as per the precautionary approach. Please note that for salmon fisheries, established goals take into account each stock over its entire area of distribution, because escapement is the net result of all factors, which have influenced each stock during its juvenile stages in freshwater, its oceanic migration, and the fisheries to which it is subjected.

Current Status/Appropriateness: *If a stock is subject to two or more jurisdictions (nations, states, etc.) (either by distribution or migration), then exploitation by all jurisdictions shall be considered when defining exploitation levels and determining stock status to avoid overfishing/depletion of the resource. The scoring of this parameter shall consider that significant migration may take a species outside the jurisdiction of the managing agency (e.g., for significant feeding or ontogenetic migration).*

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

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management measures consider (1) the stock status over its entire area of distribution, (2) the area through which the stock migrates during its life cycle, and (3) other biological characteristics of the stock. Examples may include the presence of genetic studies, age structure data, stock assessments or other relevant information.*

Evaluation (per parameter)

Current Status/Appropriateness:
Pacific cod are widely distributed over the EBS, AI and GOA. The biological characteristics of Pacific cod are well known. There are numerous sources of information on Pacific cod biology, including the SAFE reports prepared annually by scientists from AFSC, ADFG and other agencies and universities. The AFSC website also provides summaries for Pacific cod biology and relevant studies under various headings.

Although they are not considered to be a migratory species, individual adult Pacific cod have been found to move both within and between the EBS, AI, and GOA (Shimada and Kimura 1994). The resource in the EBS and AI (BSAI) region had been managed as a single unit from 1977 through 2013, however, research indicating the existence of discrete stocks in the EBS and AI (Spies 2012) separate harvest specifications have been set for the two areas since the 2014 season (see Section 3.1.2.3). The resource in GOA is managed as a single stock. The three SAFE reports explicitly state that Pacific cod is not known to exhibit any special life history characteristics that would require it to be assessed or managed differently from other groundfish stocks in the BSAI or GOA.

The biological units are not considered to extend beyond the jurisdiction of the management organizations with the managed stocks being restricted to the Alaska EEZ.

Effectiveness:
The assessment models used for the Pacific cod stocks in Alaska 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. 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. The AI Pacific cod assessment relies on survey biomass estimates and a simpler random effects model, although various age-structured models have been reported upon.

Evidence Basis:
The NMFS/AFSC website has detailed information on Pacific cod research and stock assessment. The SAFE reports are compiled annually by the BSAI and GOA Groundfish Plan Teams, which are appointed by the Council. As outlined in the current Council

Groundfish FMPs for BSAI and GOA, scientists from the AFSC, ADFG, other agencies, and universities prepare a SAFE report annually.

Data on catches of Pacific cod are maintained and updated by NMFS and are available on their website. The SAFE documents contain extensive details on the catch and other data time series used in the stock assessments, including the catches from the state-water fisheries.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

NPFMC 2019a, BSAI Pacific cod Allocation Review https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Pcod/BSAIPcodAllocationReview2019.pdf

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Shimada A. M., Kimura D.K., 1994. Seasonal movements of Pacific cod (*Gadus macrocephalus*), in the eastern Bering Sea and adjacent waters based on tag-recapture data. Fishery Bulletin 92(4) 1994. https://spo.nmfs.noaa.gov/sites/default/files/pdf-content/1994/924/shimada.pdf

Spies, I., 2012. Landscape Genetics Reveals Population Subdivision in Bering Sea and Aleutian Islands Pacific Cod. Transactions of the American Society. Volume 141, Issue 6. https://www.tandfonline.com/doi/abs/10.1080/00028487.2012.711265

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.3.1

Evaluation Parameters

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

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

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that previously agreed management measures established and applied in the same region are taken into account by management.*

Evaluation (per parameter)

Process:
The Council commits to: periodically review all critical components of the FMP and maintain a continuing review of the fisheries managed under their FMPs; annually review objectives in the management policy statement; and, conduct a complete review of EFH once every five years and, in between, will solicit proposals on Habitat Areas of Particular Concern (HAPCs) and/or conservation and enhancement measures to minimize potential adverse effects from fishing (NPFMC 2020a, b).

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

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

Pacific cod is considered essential prey for Steller sea lions and management measures have been implemented to mitigate negative impacts of Pacific cod fisheries on Steller sea lions. This includes closed areas that been not only been maintained through the years but extended.

Evidence Basis:
The Council FMPs (see Table ES-2 in NPFMC 2020a, b) explicitly describe the Council's commitment to review management issues and this is reflected in the agenda and outcomes of the multiple 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.

References:
NPFMC Council Meeting Schedule https://www.npfmc.org/upcoming-council-meetings/
NPFMC Council meeting archive https://www.npfmc.org/council-meeting-archive/
NPFMC upcoming Council meetings https://www.npfmc.org/wp- content/PDFdocuments/meetings/threemeetingoutlook.pdf
BOF meeting schedule http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo
BOF review of meetings http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC Halibut bycatch https://www.npfmc.org/fisheries-issues/bycatch/halibut-bycatch/
NOAA 2022a Bering Sea and Aleutian Islands (BSAI) Halibut Abundance – Based Management https://www.fisheries.noaa.gov/alaska/bycatch/bering-sea-and-aleutian-islands-bsai-halibut-abundance-based-management

Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

1.3 Where transboundary, shared, straddling, highly migratory, or high seas stocks are exploited by two or more States (neighboring or not), the applicant and appropriate management organizations concerned shall cooperate and take part in the formal fishery commission or arrangements appointed to ensure effective conservation and management of the stock(s) in question and their environment.

Evaluation Parameters

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

Process: *There is a mechanism in place by which the applicant organization(s) cooperates for the management of the transboundary, shared, straddling, highly migratory or high seas stock. This mechanism has the sustainable total exploitation of the stock as its main objective.*

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that where transboundary, shared, straddling, highly migratory, or high seas fish stocks are exploited by two or more States, the applicant and appropriate management organizations concerned cooperate and take part in formal fishery discussions or arrangements that have been appointed to ensure effective conservation and management of the stock(s) and fisheries in question. Examples may include evidence of formal agreements, records of meetings, and decisions.*

Evaluation (per parameter)

The Pacific cod stock is not considered to be a transboundary, straddling, highly migratory, or high seas stock and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

1.3.1 Conservation and management measures established for the *stock under consideration* within the jurisdiction of the relevant States for transboundary, shared, straddling, highly migratory, or high seas stocks, shall be compatible in a manner consistent with the rights, competence, and interests of the States concerned.

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

Evaluation Parameters

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

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

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that conservation and management measures established for the stock within the jurisdiction of the relevant States for shared, straddling, high seas, or highly migratory stocks, are compatible in a manner consistent with the rights, competences, and interests of the States concerned. Examples may include evidence of formal agreements, records of meetings and decisions, stock assessment, and other reports.*

Evaluation (per parameter)

The Pacific cod stock is not considered to be a transboundary, straddling, highly migratory, or high seas stock and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

1.4 A State's fishery management organization not member or 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 or arrangement.

FAO CCRF (1995) 7.1.5

Evaluation Parameters

Note: *This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.*

Process: *There is ongoing cooperation in stock assessment, data sharing, and other activities.*

Current Status/Appropriateness/Effectiveness: *Relevant measures are implemented by non-member States.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State non-member or participant of a sub-regional or regional fisheries management organization cooperates, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization or arrangement. Examples may include reports detailing results of common surveys or acceptable harvest rates.*

Evaluation (per parameter)

The Pacific cod stock is not considered to be a transboundary, straddling, highly migratory, or high seas stock and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.3.5

Evaluation Parameters

Note: *This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.*

Process: *There is a history of prior consultation.*

Current Status/Appropriateness/Effectiveness: *The views of the managing fishery organization are taken into account.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that a fishery management organization seeking to take any action through a non-fishery organization which may affect the conservation and management measures taken by a competent sub-regional or regional fisheries management organization or arrangement consults with the latter, in advance to the extent practicable, and take its views into account. Examples may include reports detailing action taken by the State(s) in question.*

Evaluation (per parameter)

The Pacific cod stock is not considered to be a transboundary, straddling, highly migratory, or high seas stock and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

1.5 The applicant's fishery management system, when appropriate for the *stock under consideration*, shall actively foster cooperation between States with regard to (1) information gathering and exchange, (2) fisheries research, (3) fisheries management, and (4) fisheries development.

FAO CCRF (1995) 7.3.4

Evaluation Parameters

Note: *This clause pertains only if stock is transboundary, shared, straddling, highly migratory, or high seas. Otherwise, this clause is not applicable. This clause is justified by the evidence provided in clause 1.2.*

Process: *The extent to which a formal process or system is available.*

Current Status/Appropriateness/Effectiveness: *Level of activity, application, and level of engagement.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the applicant's fishery management system, when appropriate for the stock under consideration, fosters active international cooperation on fishery matters with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. Example of evidence sources may include outputs from activity (e.g., reports, minutes, common or collective themes).*

Evaluation (per parameter)

The Pacific cod stock is not considered to be a transboundary, straddling, highly migratory, or high seas stock and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

1.6 A fishery management organization 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 States to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements shall aim to recover the costs of fisheries conservation, management, and research.

FAO CCRF (1995) 7.7.4

Evaluation Parameters

Process: *There is an agreed-upon system to finance the fishery management organizations and arrangements.*

Current Status/Appropriateness/Effectiveness: *The fishery management organizations and arrangements are currently financed using a cost recovery or other system.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is agreement on the means by which the activities of such organizations and arrangements are financed. Where appropriate, and when possible, such organizations and arrangements aim to recover the costs of fisheries conservation, management, and research. Examples may include data showing the expenditure and cost recovery derived from fisheries management.*

Evaluation (per parameter)

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

The federal budget cycle can be summarized in the following steps:

1. Office of Management and Budget issues budget guidance NMFS submits its budget
2. Department of Commerce and NOAA issue budget guidance
3. NMFS submits its budget to NOAA
4. NOAA submits it budget to Department of Commerce
5. Department of Commerce submits its budget to Office of Management and Budget
6. President's budget delivered to Congress
7. NOAA and Department of Commerce discuss the proposed budget with Congress
8. Deliberations by congressional appropriations committees
9. Budget execution

10. Spending and performance information sent to Office of Management and Budget – back to step 1

The state budget cycle can be summarized in the following steps:

1. State agencies (e.g., ADFG) prepare and send their budgets to the Governor's Office of Budget Review.
2. The Governor's Office of Budget Review checks agency requests and prepares recommendations to the Governor.
3. The Governor reviews, sets budget amounts and submits the appropriation bill and budget documents to the State.
4. The House and Senate Rules Committees introduce companion bills (similar or identical bills) for the House and Senate Finance Committees to review.
5. Subcommittees work on the budgets for each department and submit recommendations to the full Finance Committees.
6. The full House Finance Committee finalizes the budget for each Department and moves a Committee Substitute bill out of committee.
7. The bill goes to the floor of the House in second reading and can be amended. Then the bill is moved to third reading, voted on, and sent to the Senate.
8. The Senate Finance Committee completes their work and sends their own Committee Substitute to the floor of the Senate, where it can be amended and then voted on.
9. The Senate version is sent back to the House for concurrence. Typically, the House does not concur, but asks the Senate to recede from their amendments.
10. Typically, the Senate does not recede, and a conference committee is appointed.
11. The Conference Committee works out a compromise version of the budget.
12. The House and Senate approve the Conference Committee Substitute and send it to the Governor.
13. The Governor reviews the bill and may exercise his line item veto power.
14. The bill becomes law and is effective with the beginning of the fiscal year on July 1.

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

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

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

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

	$ million			
Agency	Overall Alaska region expenditure	Groundfish Fisheries	BSAI	GOA
North Pacific Fisheries Management Council (NPFMC)	3.0	2.4	0.8	1.6
National Marine Fisheries Service (NMFS):				
Sustainable Fisheries Division	3.6	2.9	0.9	2.0
Protected Resources Division	2.2	0.8		
Habitat conservation Division	1.6	0.4	0.2	0.2
Restricted Access Management	1.9	0.4	0.3	0.1
Other NMFS Regional Alaska units	6.2	3.5	1.0	2.5
Alaska Fisheries Science Centre	40.9	28.2	11.9	16.3
NOAA Office of General Council	2.0			
NOAA Office of Law Enforcement	5.0	2.4	1.8	0.6
US Coast Guard – 17th District		<40.2	<13.9	<26.3
Alaska Department of fish & Game (ADFG)		>2.5		

The budget for observer deployment in 2021 in the partial coverage category was $4,448,612 for a total of 3,193 observer days. The budget for 2021 was made up of $3,169,843 in fees (from 2020 landings) and a further $3,040,184 was made available in federal funds to support the observer and EM deployment and review grant.

References:

Alaska State Budget Cycle http://akleg.gov/docs/pdf/budgproc.pdf
Alaska Department of Revenue – Tax Division. http://www.tax.alaska.gov/programs/programs/index.aspx?60620
NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
MSA 2007 Section 304(d) - Community Development Quota (CDQ) Program. https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.pdf.
ADFG annual budgets and performance http://www.adfg.alaska.gov/index.cfm?adfg=about.budgets.
ADFG Operating Budget https://omb.alaska.gov/ombfiles/20_budget/Fish/Enacted/20depttotals_fish.pdf.
NOAA Cost Recovery Fee Program – Alaska region. https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.8.1

Evaluation Parameters

Note: *The fishery for the stock under consideration occurs outside the exclusive economic zone (EEZ), there is evidence of flags of convenience, and evidence of illegal, unreported, and unregulated (IUU) fishing. Not applicable otherwise.*

Process: *There is a system that encourages banks to require vessels to be flagged within the jurisdiction of interest.*

Current Status/Appropriateness/Effectiveness: *There is regulation that directs for vessels to be flagged outside the State's jurisdiction. The fishery for the stock under consideration occurs outside EEZ, and there are flags of convenience operations present, or evidence of IUU fishing.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State or fishery management organizations encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures. Examples may include data showing fishery operation by vessels flying a flag different from that of the State where fishing geographically occurs.*

Evaluation (per parameter)

The Alaska Pacific cod fishery takes place within the EEZ only and so this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.6.8

Evaluation Parameters

Process: *There is a procedure to review management measures. The procedure includes the use of outcome indicators against which the success of management measures in achieving specific management objectives is measured. The procedure covers all management measures, including those relating to the sustainable exploitation of the target stock; the mitigation of negative impacts on non-target species through bycatch, discarding, and indirect effects; and the protection of Endangered, Threatened, Protected (ETP) species and the physical environment. Please note that both the management processes of the North Pacific Fishery Management Council (NPFMC) for federal waters, and the Alaska Board of Fisheries (BOF) for state waters, allow for the continuous review of conservation and management measures. Such processes shall be clearly documented as relevant to key management measures for the fishery under assessment.*

Current Status/Appropriateness/Effectiveness: *If, as a result of the review process, it is determined that management measures are not achieving the specific management objectives they are designed to achieve, they are revised and updated as appropriate.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that within the fishery management system, procedures are in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review, and to revise or abolish them in the light of new information. Examples may include data showing recent regulation or management plan revisions.*

Evaluation (per parameter)

Process:
There are procedures at multiple levels to review management measures. The principle legislative instrument – the MSA – that established the management framework, is reviewed by Congress every five years and is periodically revised and reauthorized. The adaptive management approach taken in the Alaska 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 (EIS) are undertaken when the FMPs are amended in order to review the environmental and socio-economic consequences, as well as assess the effectiveness of the changes. Stakeholders are actively encouraged to participate in Council and BOF meetings and, in so doing, opportunity to review management measures is provided.

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

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

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

With respect to the schedule for review, the Council commits to maintaining a continuing review of the fisheries managed under the FMPs, and periodic reviews of all critical components of the FMP. This includes annually reviewing the objectives in the management policy statement and, once every five years, reviewing and amending, as appropriate, the EFH components of the FMPs. Council meetings are open, and public testimony – both written and oral – is taken on every issue prior to deliberations and final decisions. Public comments are also taken at all AP and SSC meetings. Written comments can be submitted. Any letters that are submitted are put in the Council notebooks. New issues to the Council, are usually addressed at the end of the meeting under an agenda item called “Staff Tasking.” The public are given a chance to comment on these items during an open forum (NPFMC 2022b). The BOF also provides opportunity for input through public notification and their website of upcoming meetings and opportunities to input into the management process (ADFG 2022d).

Stock status is reviewed annually. Scientists at the AFSC conduct research and stock assessments on Pacific cod in Alaska each year, producing annual SAFE reports for the federally managed EBS, AI, and GOA stocks. These SAFE reports summarize the best-

available science, including the fishery dependent and independent data, document stock status and significant trends or changes in the resource, marine ecosystems and fishery over time. The reports also assess the relative success of existing state and Federal fishery management programs and, based on stock status indicators, provide recommendations for annual quotas and other fishery management measures.

The 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.

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

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

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

References:

ADFG 2022d. “Submit written comments” http://www.adfg.alaska.gov/index.cfm?adfg=process.comments

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

NEPA 2005. Fishery Management Guidance for NEPA Reviews https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews

NPFMC 2022b “How do I get involved” https://www.npfmc.org/how-do-i-get-involved/

PSEIS 2015, Programmatic Supplemental Environmental Impact Statement Information Report 2015. https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-fisheries-programmatic-supplemental-environmental-impact

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O’Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.1.9

Evaluation Parameters

Current Status: *There is transparency in management arrangements. Please note that both the management processes of the NPFMC for federal waters, and the BOF for state waters, shall be clearly documented to provide evidence for the transparency of these arrangements and decision-making processes.*

Effectiveness: *There is transparency in decision-making processes.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the management arrangements and decision-making processes for the fishery are organized in a transparent manner. Examples may include records of the management arrangements and decision-making processes.*

Evaluation (per parameter)

Current Status:
Management arrangements for the Alaska Pacific cod fisheries are easily accessible on the, NOAA/NMFS, the Council, and ADFG websites and from NMFS and ADFG offices as well as local offices of the OLE and AWT.

Effectiveness:
The NPFMC imposes transparency so that all Council discussions are open to the public. No more than a predetermined number of Council members can meet unless the meeting is an open public meeting. Each Council decision is made by recorded vote in a public forum after public comment. Final decisions then go to the Secretary of Commerce for a second review, public comment, and final approval. Decisions must conform with the MSA, the NEPA, Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), and other applicable law including several executive orders. The BOF also holds multiple public meetings each year at various locations throughout Alaska and establishes similar decision-making processes, with each BOF decision being recorded in a public forum after public comments.

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

described in the Council guide for navigating the Council process (NPFMC 2017) and the Statement of Organization, Practices and Procedures (NPFMC 2019b).

References:

NPFMC 2017. Navigating North Pacific Fishery Management Council Meetings: A Guide for the Young Fishermen's Summit. https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

NPFMC 2019b, Statement of Organization, Practices and Procedures https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/NPFMC_SOPP_October2019.pdf

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

1.9 Management organizations not party to the Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing in the High Seas shall be encouraged to accept the Agreement and to adopt laws and regulations consistent with the provisions of the Agreement.

FAO CCRF (1995) 8.2.6

Evaluation Parameters

Note: *Not applicable if the fishery does not occur in high seas.*

Process: *Regulation to implement the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas has been adopted. Assessors shall consult the following document http://www.fao.org/docrep/meeting/003/x3130m/X3130E00.htm for reference to the Agreement.*

Current Status/Appropriateness/Effectiveness: *There are laws regulating high seas fishing activity. Describe how they accomplish this.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization is party to the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas or has adopted laws and regulations consistent with the provisions of the Agreement. Examples may include reports on the management of high seas fishing activities.*

Evaluation (per parameter)

This clause is not applicable as the fishery does not occur in high seas.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

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

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

FAO CCRF (1995) 10.1.1, 10.1.3, 10.2.3

Evaluation Parameters

Process: *A mechanism exists by which the integrated management of multiple coastal area uses is conducted, the possible uses of coastal resources are assessed, and access to them is governed. Accordingly, policies for the management of the coastal area are set. Assessment teams shall document how existing authorities and/or processes cooperate and interact together to manage coastal resources (living and non-living) in a transparent, organized, and sustainable way that minimizes environmental issues while taking into account the socio-economic aspects, needs, and interests of the various stakeholders of the coastal zone.*

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that within the fisheries management organization's jurisdiction, an appropriate policy within the legal and institutional framework has been adopted in order to achieve sustainable and integrated use of living marine resources. Examples may include coastal management plans or other policy documents, and frameworks for resource/coastal management.*

Evaluation (per parameter)

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

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

The NMFS, the Council, and ADFG have processes, committees, and groups that allow potential coastal zone developments and issues to be brought to formal review. In addition to the Council and BOF meetings, the Council has established a Community Engagement Committee (CEC) to identify and recommend strategies for the Council to provide effective community engagement with rural and Alaska Native communities. The Alaska Fisheries Science Centre have recently produced a report – the Annual Community Engagement and Participation Overview, which will be updated annually and provides social and economic information at the community level for those fishing communities which as substantially dependent on, or engaged in, the North Pacific Groundfish and Crab fisheries. Furthermore, Advisory Committees are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attend the Advisory Committee meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities.

The coastal zone is monitored as part of the coastal management process using physical, chemical, biological, economic, and social parameters. Involvement include federal and state agencies and programs including the U.S. Forest Service, USFWS, NMFS Pacific Marine Environmental Lab, the Alaska Department of Environmental Conservation Division of Water, ADFG Habitat Division, the

AFSC's "Ecosystem Monitoring and Assessment Program", The NMFS' Habitat Conservation Division and their EFH monitoring and protection program, the USCG, the NMFS Alaska Regional Office's Restricted Access Management Program, the Alaska National Interest Lands Conservation Act federal agencies cooperation directive, and the Department of Natural Resources Office of Project Management and Permitting coordinating the review of large scale projects in the state of Alaska.

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

The Council and the BOF system was designed so that fisheries management decisions were 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. Initiatives, such as CEC and Annual Community Engagement and Participation Overview, enhance community engagement.

ADFG participates in land use review process that include land use planning, permit, and lease reviews for activities on State land and waters and reviewing land disposal that may affect fish and wildlife and public use of these resources. ADFG staff also review proposed land development activities on federal lands under the Alaska National Interest Lands Conservation Act on Actions under the Alaska Native Claims Settlement Act. ADFG also participates in Advisory Committee meetings where information can be shared, and local opinions on fisheries related matters can be sought.

Evidence Basis:
NOAA has set up their policy and procedures for compliance with NEPA which explicitly sets out NEPA procedures in relations to fisheries (NEPA 2005). The NMFS Alaska region websites also includes all the on-going EFH consultations in relation to coastal development proposals.

As well as the Council and BOF meeting process allowing for coastal zone management and any community concerns or needs to be formally aired within a public forum. The ADFG website also provides information on their input into planning processes (ADFG 2022e).

References:

Coastal Zone Management Act 1972 https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86- Pg1280.pdf
NEPA 2005. NEPA Fishery Management Guidance for NEPA Reviews https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews
NPFMC. 2018c. Community Engagement Committee, Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/CEC/CEC_TOR_1218.pdf.
NOAA. 2021. Annual Community Engagement and Participation Overview (ACEPO) https://meetings.npfmc.org/CommentReview/DownloadFile?p=b26ba0fd-2447-41b2-8de5-6a1a4c488471.pdf&fileName=D8%20ACEPO%20ESSR.pdf.
ADFG 2022e – Planning process http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions.
ADFG. 2022f. Advisory Committees https://www.adfg.alaska.gov/index.cfm?adfg=process.advisory.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 10.4.1

Evaluation Parameters

Process: *There is a mechanism to allow cooperation between neighboring States to improve coastal resource management.*

Current Status/Appropriateness/Effectiveness: *There are records of cooperation. Examples may include fishery, fishery enhancement, or other agreements or records from international forums.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the States establish mechanisms for cooperation and coordination in planning, development, conservation, and management of coastal areas. Examples may include reports or data on the international cooperation/information exchange in these events.*

Evaluation (per parameter)

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

The only other coastal state in the GOA is Canada to the south. In this instance, the Pacific cod stock is not considered to be a shared stock. The US and Canada have a very strong working relationship at both the national and regional levels. In cases involving boundary disputes and treaties governing fishery access, the USCG, NOAA, and Canadian Department of Fisheries and Oceans along with Canadian Coast Guard counterparts have effectively coordinated living marine resource enforcement efforts despite occasional related political and economic tensions.

Evidence Basis:
There are established agreements and shared management and working practices (e.g., International Pacific Halibut Commission, Pacific Salmon Treaty, agreements between the U.S. and Canada on enforcement).

References:

Pacific Salmon Treaty http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/
NOAA 2022b. Agreement between the US and Canada on enforcement. https://www.fisheries.noaa.gov/topic/international-affairs

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 10.4.2

Evaluation Parameters

Process: *There are appropriate technical capacities and financial resources.*

Current Status/Appropriateness/Effectiveness: *It can be determined with confidence that there are appropriate technical capacities and financial resources.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization ensures that the authority or authorities representing the fisheries sector and fishing communities in the coastal management process have the appropriate technical capacities and financial resources. Examples may include reports or data, overall operating staff, and financial resources/budgets available.*

Evaluation (per parameter)

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

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

Evidence Basis:
The federal and state financial resources are outlined in Section 1.6 of this report. NMFS and AFDG staffing complement are available on their respective websites (ADFG 2022e, NOAA 2022c).

The NMFS, the Council, and ADFG have processes, committees, and groups that support coastal communities in the coastal management process. In addition to the Council and BOF meetings where experts are on-hand to provide support and technical expertise, NPFMC has established CEC to identify and recommend strategies for the Council to provide effective community

engagement with rural and Alaska Native communities. Furthermore, Advisory Committees are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the Advisory Committee meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities.

References:

ADFG. 2022f. Advisory Committees https://www.adfg.alaska.gov/index.cfm?adfg=process.advisory.
ADFG 2022g. Our Structure & Staff http://www.adfg.alaska.gov/index.cfm?adfg=about.structure
NOAA. 2021. Annual Community Engagement and Participation Overview (ACEPO) https://meetings.npfmc.org/CommentReview/DownloadFile?p=b26ba0fd-2447-41b2-8de5-6a1a4c488471.pdf&fileName=D8%20ACEPO%20ESSR.pdf.
NPFMC. 2018c. Community Engagement Committee, Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/CEC/CEC_TOR_1218.pdf.

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**		**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**	**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐		Major ☐	Minor ☐	None ☒
Non-Conformance Number (if applicable):					

2.2 Representatives of the fisheries sector and fishing communities shall be consulted in the decision-making processes involving activities related to coastal area management planning and development. The public, as well as others affected, shall also be kept aware of the need for protection and management of coastal resources, and shall participate in the coastal management process.

FAO CCRF (1995) 10.1.2, 10.2.1

Evaluation Parameters

Process: *Describe how fishery-related information is disseminated and how a process is in place to consult with the fishery sector and fishing communities.*

Current Status/Appropriateness/Effectiveness: *There are records of consultations with the fisheries sector and fishing communities. Attempts have been made to create public awareness on the need for protection and management of coastal resources, and those affected by the management process have been made aware of its provision.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and involved in other activities related to coastal area management planning and development. The public, and others affected, are also kept aware of the need for the protection and management of coastal resources and are participants in the management process. Examples may include public records of consultation activities and other available documentation published on the internet or distributed at public meetings.*

Evaluation (per parameter)

Process:
The NMFS and the Council participate in coastal area management-related institutional frameworks through the federal NEPA processes. These include consultation and decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. This applies directly to changes to fisheries and fishery practices as well as coastal developments and activities that might impact the coastal environment and have a consequence to fishery resources and habitats (e.g., Pebble Mine). To implement NEPA's policies, Congress prescribed a procedure, commonly referred to as "the NEPA process" or "the environmental impact assessment process." The NEPA processes provide public information and opportunity for stakeholder involvement at both the state and federal levels. In this way, any application for a permit to undertake an activity or development in the coastal region, requires the agency that is being asked to issue the permit to evaluate the environmental effects of the permit and follow the NEPA process.

As a result, representatives of the fisheries sector and fishing communities are consulted in the decision-making processes and in other activities related to coastal area management planning and development and kept aware of the need for protection and management of coastal resources.

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

Evidence Basis:
The 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. Furthermore, the Council and ADFG are statutorily obliged to establish or participate in more regional or local fora in order to engage stakeholders and encourage their contribution to the decision-making process.

References:

ADFG 2022d. "Submit written comments" http://www.adfg.alaska.gov/index.cfm?adfg=process.comments
NEPA 2005. NEPA Fishery Management Guidance for NEPA Reviews https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews
NPFMC 2017. Navigating North Pacific Fishery Management Council Meetings: A Guide for the Young Fishermen's Summit. https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf
NPFMC 2022b "How do I get involved" https://www.npfmc.org/how-do-i-get-involved/

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

2.3 Fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g., fisheries enhancement facilities, 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 that arise within the fisheries sector and between fisheries resource users and other coastal users.

FAO CCRF (1995) 7.6.5, 10.1.4, 10.15

Evaluation Parameters

Process: *These practices have been adopted, and there is a process to regulate fishing gear, methods, and vessels so as to avoid risk of conflict. If conflicts arise, there is a process in place to settle conflicts between fishery users and other users.*

Current Status/Appropriateness/Effectiveness: *Describe these practices and their effectiveness within the fishery sector, and between fishers and other coastal users.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fisheries practices that avoid conflict among fishers and other users of the coastal area (e.g., fisheries enhancement facilities, tourism, energy) are adopted and fishing is regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear, and fishing methods. Procedures and mechanisms are established at the appropriate administrative level to settle conflicts that arise within the fisheries sector, and between fisheries resource users and other coastal users. Examples may include laws and regulations or other documents.*

Evaluation (per parameter)

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

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

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

Current Status/Appropriateness/Effectiveness:

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

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

References:

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
FMP Amendments https://www.fisheries.noaa.gov/search?oq=fmp+amendments
Amendment 111 to the FMP for the groundfish of the BSAI management area. https://www.fisheries.noaa.gov/action/amendment-111-fmp-groundfish-bering-sea-and-aleutian-islands-management-area

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.1.10

Evaluation Parameters

Process: *There is a process that allows for fishery-related information to be disseminated.*

Current Status/Appropriateness/Effectiveness: *There is a record of the disseminated information, and is it disseminated effectively, and the basis and purposes of such regulation explained to users.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States' fisheries management organizations and sub-regional or regional fisheries management organizations and arrangements give due publicity to conservation and management measures and ensure that laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures are explained to users of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures. Examples may include records of such management measures published in the internet or distributed at public meetings.*

Evaluation (per parameter)

Process:
The Council and BOF provide considerable fishery related information on their websites, including draft regulations related to the fisheries. The Council and BOF public meetings and process ensure awareness and input into the decisions for conservation and management measures and the outcomes. The OLE and AWT put an emphasis on educating and informing stakeholders of new regulatory changes and other important fishery related matters. Regular contact with fishers helps to ensure dissemination of information.

Current Status/Appropriateness/Effectiveness:
The Council and BOF processes and participatory approach allows fishery-related information to be explained and discussed. Meetings of the Council and BOF are publicized, supporting information and topics are disseminated and outcomes are posted on through their respective websites. Transcripts and recordings of meetings are also available.

Evidence Basis:
The Council and ADFG websites ensure access is readily available to stakeholders prior to or after meetings and, as such conservation and management measures are effectively disseminated. The OLE and AWT websites publicize the conservation and management measures.

References:

OLE 2021b, Office of Law Enforcement Alaska Enforcement Division December Report to the North Pacific Fisheries Management Council. October 2020 to September 2021 https://meetings.npfmc.org/CommentReview/DownloadFile?p=188b9834-6bd4-4281-b950-37581d7f6580.pdf&fileName=B4%202021%20December%20OLE%20Report.pdf

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

2.5 The economic, social, and cultural value of coastal resources shall be assessed by the appropriate fisheries management organization in order to assist decision making on their allocation and use.

FAO CCRF (1995) 10.2.2

Evaluation Parameters

Process: *There is a system that allows for socio-economic value assessments and cultural value assessments to be carried out.*

Current Status/Appropriateness/Effectiveness: *There are socio-economic value assessments and cultural value assessments, both of which are effectively assisting decision making on resource allocation and use.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the economic, social, and cultural value of coastal resources is assessed in order to assist decision decision-making on their allocation and use. Examples may include reports on social, cultural, and economic value of the resource.*

Evaluation (per parameter)

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

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

Evidence Basis:
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.

References:

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

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

2.6 States shall cooperate to support and improve coastal area management, and in accordance with capacities, measures shall be taken to establish or promote (1) systems for research and monitoring of the coastal environment, and (2) multidisciplinary research of the coastal area using physical, chemical, biological, economic, social, legal, and institutional capabilities.

FAO CCRF (1995) 10.2.4, 10.2.5, 10.3.3
FAO CCRF (1995) 8.11.3

Evaluation Parameters

Process: *There is a system that allows research and monitoring of the coastal environment, and multidisciplinary research in support of coastal area management is promoted.*

Current Status/Appropriateness/Effectiveness: *Systems of monitoring and research have taken into account physical, chemical, biological, economic, social, legal, and institutional capabilities to support coastal area management.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is cooperation to support and improve coastal area management, and in accordance with capacities, measures are taken to establish or promote (1) systems for research and monitoring of the coastal environment, and (2) multidisciplinary research of the coastal area using physical, chemical, biological, economic, social, legal, and institutional capabilities. Examples may include reports on the status of the coastal area using the various aspects listed above.*

Evaluation (per parameter)

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

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

NMFS, Alaska Region, Fisheries' Habitat Conservation Division works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on EFH and living marine resources in Alaska. This work includes conducting and/or reviewing environmental analyses for a large variety of activities ranging from commercial fishing to coastal development to large transportation and energy projects. The Habitat Conservation Division identifies technically and economically feasible alternatives and offers realistic recommendations for the conservation of valuable living marine resources. The Habitat Conservation Division focuses on activities in habitats used by federally managed fish species located offshore, nearshore, in estuaries, and in freshwater areas important to anadromous salmon.

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

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

As a result, the NPRB have helped fund, two major projects in the Alaska region:

- The Bering Sea Project, is a partnership between the NPRB and the National Science Foundation, which seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than 50 scientists from 11 institutions are taking part in the $17.6 million.

- The Gulf of Alaska Project, examines the physical and biological mechanisms that determine the survival of juvenile groundfish in the Gulf of Alaska producing products that apply the results to fisheries management.

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

Evidence Basis:
The results or progress of ongoing research identified for each of the government bodies or research and academic institutes above can be found at the website links provided in the reference section below.

References:

NOAA Fisheries Strategic Plan https://www.fisheries.noaa.gov/resource/document/noaa-fisheries-strategic-plans
Alaska Region, Fisheries' Habitat Conservation Division – Essential Fish Habitat Plan
https://www.fisheries.noaa.gov/resource/document/alaska-essential-fish-habitat-research-plan-research-plan-national-marine
University of Alaska Fairbanks – Institute of Marine Science https://www.uaf.edu/cfos/research/institute-of-marine-scien/

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**		**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**	**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐		Major ☐	Minor ☐	None ☒
Non-Conformance Number (if applicable):					

2.7 In the case of a States' activities that may have an adverse environmental effect on coastal areas of other States, States shall provide timely information and if possible, prior notification to potentially affected States, and consult with those States as early as possible.

FAO CCRF (1995) 10.3.2

Evaluation Parameters

Process: *There is a system to allow early information sharing (i.e., within appropriate timeframes to avoid negative consequences) between States in case of adverse environmental effects from one State.*

Current Status/Appropriateness/Effectiveness: *There are current agreements for or past records of such occurrences. Examples may include oil spills, and aquaculture farm escapes among others.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the case of a States' activities that may have an adverse environmental effect on coastal areas of other States, the State provides timely information and if possible, prior notification to potentially affected States. Examples may include reports or data on the international cooperation in these events.*

Evaluation (per parameter)

Process:
The risk of oil pollution and polluted water from coastal mining tailings are examples of potential transboundary environmental effects on the coastal area. Coordination and development of memoranda of cooperation and a Pacific States / British Columbia Oil Spill Task Force to deal with oil and other pollution incidents are examples of facilitating pollution preparedness, prevention, and response.

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

Evidence Basis:
Pacific States / British Columbia Oil Spill Task Force produce annual reports which include, prevention, preparedness, response and communication updates as well as jurisdictional reviews of the U.S. members' states and British Columbia.

References:

NOAA, Alaska - Analyzing risk to improve oil spill planning and response https://www.fisheries.noaa.gov/alaska/habitat-conservation/analyzing-risk-improve-oil-spill-planning-and-response
Non-fishing impacts to essential fish habitats https://www.fisheries.noaa.gov/resource/document/impacts-essential-fish-habitat-non-fishing-activities-alaska
Pacific States – British Columbia Oil Spill Task Force https://oilspilltaskforce.org
State of Alaska, Department of Environmental Conservation, Division of Spill Prevention and Response (SPAR) https://dec.alaska.gov/spar/

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

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

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

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

Evaluation Parameters

Process: *Management objectives based on the best scientific evidence available (which can include traditional/local knowledge, if verifiable) have been translated into a fishery management plan, are in regulation, or are in another document.*

Current Status/Appropriateness/Effectiveness: *The objectives described by the management plan are consistent with the sustainable use of the resource and are subscribed to by all relevant fishery stakeholders.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that scientifically based long-term management objectives consistent with the sustainable use of the resource are translated into a plan or other management document which is subscribed to by all interested parties. Examples may include fishery management plan/framework or legal rules.*

Evaluation (per parameter)

Process:
Under the MSA, the Council is required to prepare and submit an FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs must be consistent with ten national standards for fishery conservation and management (16 USC § 1851).

Current Status/Appropriateness/Effectiveness:
The Council has in place groundfish FMPs 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 objectives are:

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

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

3. Preserve Food Web:
   - Develop indices of ecosystem health as targets for management.
   - Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.
   - Continue to protect the integrity of the food web through limits on harvest of forage species.

- Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

4. Manage Incidental Catch and Reduce Bycatch and Waste:
   - Continue and improve current incidental catch and bycatch management program.
   - Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
   - Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
   - Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
   - Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.
   - Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species.
   - Control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures.
   - Reduce waste to biologically and socially acceptable levels.

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

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

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

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

9. Improve Data Quality, Monitoring and Enforcement:
   - Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
   - Develop funding mechanisms that achieve equitable costs to the industry for implementation of the Observer Program.
   - Improve community and regional economic impact costs and benefits through increased data reporting requirements.

- Increase the quality of monitoring and enforcement data through improved technology. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.
- Cooperate with research institutions such as NPRB in identifying research needs to address pressing fishery issues.
- Promote enhanced enforceability.
- Continue to cooperate and coordinate management and enforcement programs with the BOF, ADFG, and Alaska Fish and Wildlife Protection, the USCG, NMFS Enforcement, International Pacific Halibut Commission, federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

The BOF, when developing their initial groundfish management plans (BOF 1996), identified guiding principles for the development of such plans:

- Minimize bycatch to the maximum extent possible
- Consider protection of habitat from fishing practices
- Slow harvest rates to ensure adequate reporting and analysis for necessary season closures
- Utilize such gear restrictions as necessary to create a year-round harvest for maximum benefit to local communities within the state
- Harvest the resource to maximize quality and value of product
- Harvest the resource with consideration of ecosystem interactions
- Harvest to be based on the total catch of the stock that is consistent with the principles of sustained yield
- Prevent localized depletion of stocks to avoid sport, subsistence and personal use conflicts
- Management based upon the best available information presented to the board
- Management consistent with conservation and sustained yield of healthy groundfish resources and of other associated fish and shellfish species
- State fishery management plans adopted by the Board should not substantially and adversely affect federal fishery management plans adopted by the Council

However, at the 4th surveillance audit of the fishery (conducted in March 2022), it came to light that these guiding principles had been repealed in March 2013 and no other document with long term management objectives have been adopted within any of the ADFG state waters Pacific cod management plans (i.e., Prince William Sound, Cook Inlet, Kodiak, Chignik, South Alaska Peninsula and BSAI) or other management document with regard to the state managed Pacific cod fisheries.

As a result, a minor non-conformance was raised at the 4th audit and is carried over into this re-assessment.

Evidence Basis:
In combination, the requirement for the Council FMPs to be consistent with the national standards, and the adoption of their management and policy objectives, the federally managed Pacific cod fishery clearly has long-term management objectives that are consistent with the sustainable use of the resource and are subscribed to by all relevant fishery stakeholders.

State waters Pacific cod management plans are in place for the following areas: Prince William Sound, Cook Inlet, Kodiak, Chignik, South Alaska Peninsula and BSAI. These were apparently developed and implemented on the basis of guiding principles (5 ACC 28.089 [Guiding principles for groundfish fishery regulations, 1996]) developed for BOF groundfish management plans in 1996, however, these were repealed in March 2013. In so doing, this removed the only piece of ADFG documentation that meets sub-clause 3.1, i.e., "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", in relation to the state managed Pacific cod fisheries. As a result, a minor non-conformance is raised.

References:

ADFG 2022c Commercial Groundfish Fisheries Regulations – State Waters Pacific cod Management Plans (5 ACC 28.081) https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf
BOF 1996, Meeting record- "Findings from State Waters Pacific Cod Management Plan" Oct 1996, Wasilla. https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/findings/ff97169x.pdf
BOF March 20, 2013 5 ACC 28.089 repealed https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs//2012-2013/statewide/rcs/rc094_adfg_regulatory_language_board_generated_proposal.pdf NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
MSA section (16 USC § 1851) http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	1	x 3) =	7
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☒			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☒		None ☐
Non-Conformance Number (if applicable):					

3.1.1 There shall be management objectives seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any fisheries enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

FAO Eco (2011) 41

Evaluation Parameters

Process: *There is a process that allows for setting specific management objectives in fishery management plans or other relevant regulation (or other appropriate frameworks) for the protection of ETP species.*

Current Status/Appropriateness/Effectiveness: *There are clear objectives in management plans or other relevant regulations (or other appropriate frameworks) seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and fishery enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Such objectives may be outlined in overarching fisheries legislation, regulations, or management plans.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking 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. Examples may include fishery management plans/framework or legal rules.*

Evaluation (per parameter)

Process:
The processes in place address designation of species and development of objectives and measures under the ESA and MMPA for species of note – particularly Steller sea lions and northern fur seals; short-tailed albatross and a number of salmon stocks. Clause 4.2 sets out the basis of the observer program and the levels of precision available. This forms the basis of data collection directly relevant to the groundfish fisheries under assessment. This program provides comprehensive and high-quality data commensurate to the scale and intensity of the fleet component (noting that observer coverage varies between catcher processor and catcher vessels, gear type and federal and state fisheries). The observer program is ongoing and provides ongoing updated data on all major aspects of the fisheries, including interactions with endangered and prohibited species.

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

The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process).

Salmon are monitored through assessments carried out by relevant departments of Fish and Game (notably the ADFG). Within the ground fish fisheries, coded-wire tag recoveries are used to determine sources of fish taken in bycatches: observer sampling protocols implemented in 2011 improved estimates of the stock of origin (from both coded-wire tag and genetic stock assignment) of the Chinook bycatch (principally from the pollock fishery).

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

Objectives set out in the BSAI and GOA FMPs are:

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

NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤ 1% of the marine mammal's potential biological removal (PBR) level and total fishery-related mortality < 10% of PBR. Any fishery in Category III is considered to have achieved the target levels of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that > 1% but is < 50% of the stock's PBR level, if total fishery related mortality is ≥ 10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥ 50% of PBR. No Alaska groundfish fisheries, including Pacific cod, are included in Category I.

BSAI Pacific cod fishery: Marine mammals are rarely taken incidentally in the BSAI Pacific cod fisheries; comparison of species-specific bycatch estimates with the PBR for, in particular Steller sea lions and northern fur seal indicates that interaction with the Pacific cod fishery is below national limits (objectives). The current Steller sea lion Biological Opinion concluded that the Pacific cod fisheries do not endanger the stock. Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. For marine mammals whose foraging and prey preferences overlap with the fisheries, fishery removals could potentially adversely affect the amount or distribution of prey. Accordingly, habitat essential to endangered species is identified according to regulatory requirements (ESA and MMPA). NMFS has designated 100,286 square kilometers as critical habitat for Steller sea lions in the AI included 3 nm no-entry zones around rookeries, prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in Alaska; the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area. Northern fur seals do not consume significant amounts of cod, despite their spatial distribution overlapping with the cod fishery to some extent.

The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries.

The Pacific cod freezer longline fishery has the highest recorded seabird bycatch of any individual fishery, mostly Northern Fulmars, gulls, and shearwaters. Whilst most takes of Short-tailed albatross have occurred in the Pacific cod freezer longline fishery, mortality has never met or exceeded the "allowable" incidental take identified in the Biological Opinion, in most years the take is zero. The

Pacific cod longline fleet also helped pioneer the use of streamer lines and actively work with one another to keep streamer lines deployed. Research is ongoing into cryptic mortality, particularly with third and fourth wire strikes of birds.

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

GOA Pacific cod fishery: As with the BSAI fishery, direct interactions of Pacific cod gear with marine mammals is very rare. The GOA Pacific cod trawl and pot fisheries are classified as category III. A number of management actions were implemented by the Council to promote the recovery of Steller sea lions, including the prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

For seabirds, there are no records of short-tailed albatross having been taken in the GOA Pacific cod fishery. As with the BSAI fishery, a supplementary Biological Opinion concluded that groundfish fisheries in the GOA were not likely to jeopardize the continued existence of endangered Chinook stock. Nevertheless, Chinook prohibited species limits have been imposed on non-pollock trawl sector (catcher/processor and catcher vessels). Measures, such as closed areas of high bycatch (monitored through the SEASTATE system) are in place to minimize this bycatch.

Observer Program data provide annual estimates of takes of endangered species – fish (salmon), seabirds and marine mammals in the BSAI and GOA Pacific cod fisheries.

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

References:

Endangered Species Act 1973 (As Amended) https://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf
Marine Mammal Protection Act 1972 https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act
NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
Marine Mammal Protection: Conservation and Management https://www.fisheries.noaa.gov/topic/marine-mammal-protection/conservation-&-management
Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
Northern fur seal: Conservation and Management https://www.fisheries.noaa.gov/species/northern-fur-seal#conservation-management

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO Eco (2011) 41.3

Evaluation Parameters

Process: *There is a mechanism in place by which the essential habitat of the stock under consideration and the potential impacts of the fishery (i.e., employing bottom contact gear) upon them are identified. This or a similar mechanism shall also be in place to identify habitats, which are highly vulnerable to fishery activities by the unit of certification. The information provided by these mechanisms shall be used to produce specific management objectives seeking to avoid significant negative impacts on habitats. When identifying highly vulnerable habitats, their value to ETP species shall be also considered, with habitats essential to ETP species being categorized accordingly.*

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking to avoid, minimize, or mitigate impacts of the unit of certification on the stock under consideration's essential habitats and on habitats that are highly vulnerable to damage by the unit of certification's fishing gear. Examples may include various regulations, fishery management plans, data, and reports.*

Evaluation (per parameter)

Process:
This issue is considered more fully under Clauses 12.2.7 and 12.2.8. The MSA requires Councils to identify EFH for all fisheries and to 'prevent, mitigate or minimize, to the extent practicable' any adverse effects of fishing on EFH that are 'more than minimal and not temporary'. Councils are also required to give special attention to HAPCs. There is also a requirement for a five-yearly review of methods to evaluate effects on EFH.

The latest review of EFH issues has developed a hierarchical impact assessment methodology to operationalize the 'more than minimal and not temporary' criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below the minimum stock size threshold (MSST; defined as 0.5 x MSY). For stocks at this level, mitigation measures would be required if the stock assessment author determines that there is a plausible connection to reductions in EFH. The next question is whether the "core EFH area" (CEA; defined as the 50% quantile of EFH) is disturbed by fishing. If so, then stock assessment authors must determine whether critical life-

history characteristics of the stock are correlated with the proportion of CEA affected. If correlations suggest a plausible stock effect, plan teams and SSC will consider appropriate mitigation measures to recommend to Council.

HAPCs are designated following a nomination process according to the Council's priorities. HAPC nominations are generally on a five-year cycle but may be initiated at any time. Previous priorities have been seamounts and undisturbed coral areas; the last process was carried out according to a priority of identifying skate nursery areas.

The SAFE assessments also include specific indicators of vulnerable habitat (corals, sponges, and sea whips) for which trends are monitored and appropriate mitigation may be implemented as necessary.

Current Status/Appropriateness/Effectiveness:
The mechanisms developed to identify significant effects on EFH and for identifying HAPC have been developed and 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.

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

References:

Essential Fish Habitat (EFH) in Alaska https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska
Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Provisions in Alaska Fisheries – Federal Register Rules and Notices https://www.fisheries.noaa.gov/action/essential-fish-habitat-efh-and-habitat-areas-particular-concern-hapc-provisions-alaska

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

3.1.3 There shall be management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement) on the structure, and function of the ecosystems that are likely to be irreversible or very slowly reversible.

FAO Eco (2011) 36.9

Evaluation Parameters

Process: *There is a process in place by which adverse impacts of the fishery (including any fishery enhancement) on the structure, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible are identified. Reversibility refers to the*

effects of a process or condition capable of being reversed so that the previous state is restored. This process results in setting relative management objectives. Management priority shall be focused primarily towards minimizing and avoiding identified impacts.

Current Status/Appropriateness/Effectiveness: *There are management measures in place to achieve the objectives described in the process parameter. Such objectives may be outlines in overarching fisheries legislation, regulations, or management plans.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are management objectives seeking to minimize adverse impacts of the fishery (including any enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Examples may include fishery management plans, other regulatory documents, or laws.*

Evaluation (per parameter)

Process:
Effects on ecosystem aspects are considered more fully under Clauses 12.1-12.4. Essentially, there are several processes in place which demonstrably address actual or potential impacts identified through the monitoring of the groundfish fishery and the ecosystem supporting the fishery.

The primary mechanism is the annual SAFE report. Following scientific assessment by the assessment authors, NMFS plan teams, information and recommendations are made to the SSC and Council. The Council, following reviews of relevant information, will recommend TACs for each target species. It is noted that this council review includes consideration of inputs on effects on habitats, protected species and the wider ecosystem, all of which may affect decision making. The process of managing the groundfish fishery in relation to these considerations is set out in the FMP. The FMP is also subject to review through the PSEIS to determine the impacts of management options and so selection of the preferred (least damaging) options.

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

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

1. Conservative harvest levels are set for single and multi-species fisheries – these are demonstrable for each target species and group affected.
2. Acceptable Biological Catch levels are adjusted to account for uncertainty and wider effects on the ecosystem.
3. Measures are in place to minimize bycatch and discarding (see Clause 12.2.1), including specific requirements and management/operational responses relating to prohibited species (notably Chinook salmon and halibut).
4. Measures have been implemented to minimize direct effects on endangered species and prohibited species and to minimize indirect effects (such as closure of essential habitat surrounding Steller sea lion rookeries.
5. Measures are in place to protect essential fish habitat (where relevant) and HAPCs. Several HAPCs are designated in the GOA, EBS and AI – see Clause 12.2.6.

Current Status/Appropriateness/Effectiveness:
Wherever impacts are identified (and again this is far more precautionary than only addressing only effects with serious consequences), there is evidence available to support the use of an immediate management response, as set out above. In some cases, further information may be required, and if so, studies are implemented generally with an accompanying precautionary management measure. For example, the Northern fur seal is Listed as depleted under the MMPA, with the Eastern Stock population at ~1/3 of its historical peak. This has already been considered in a precautionary way in TAC-setting through Council consideration of ecosystem indicators, one of which is fur seal pup success.

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

References:

PSEIS 2015. Programmatic Supplemental Environmental Impact Statement (PSEIS) https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management
Northern fur seal: Conservation and Management https://www.fisheries.noaa.gov/species/northern-fur-seal#conservation-management
Biological opinions issued in the Alaska region https://www.fisheries.noaa.gov/alaska/consultations/section-7-biological-opinions-issued-alaska-region

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

3.2 Management measures shall provide, *inter alia,* that:

3.2.1 Excess fishing capacity shall be avoided, and exploitation of the stocks shall remain economically viable.

Evaluation Parameters

Process: *There are management measures in place to limit and/or reduce the total fishing capacity of the unit of certification. These measures shall include specific fishing capacity objective(s), which themselves are based on the best scientific evidence available to understand the level of fishing pressure appropriate to ensure the long-term sustainability of the fishery. Please note that assessors should ensure that catches are within limits, and that data from enforcement show an adequate level of compliance with fisheries laws and regulation.*

Current Status/Appropriateness/Effectiveness: *The fishing capacity of the unit of certification is at or below the level of the specific fishing capacity objective(s).*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that excess fishing capacity is avoided and exploitation of the stocks remains economically viable. Examples may include fishery reports on harvest recommendation or fleet reports.*

Evaluation (per parameter)

Process:
In 1995, the Council adopted the Alaska LLP. The intent of the program has been to use fishing track record to rationalize the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licenses.

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

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.

There are four exceptions to the LLP license requirement:

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

Current Status/Appropriateness/Effectiveness:
Groundfish licenses are currently required to participate in the BSAI groundfish fisheries in Federal waters. Groundfish licenses contain endorsements that define what the vessel using the license is allowed to do. An area endorsement defines the geographic location the license allows a vessel to fish. Under the groundfish LLP, separate BS and AI area endorsements were earned and issued based on historic fishing patterns. Licenses may contain endorsements for both areas (BS and AI), or one of the two areas. Gear endorsements define what type of gear may be used: non-trawl, trawl, or both. Further, Pacific cod gear endorsements are required for non-trawl vessels ≥60 feet to participate in the BSAI fixed gear Pacific cod fishery: hook-and-line catcher processors, pot catcher processors, hook- and-line catcher vessels, and pot catcher vessels. Vessels fishing with jig gear in the BSAI are exempt from the LLP, provided they comply with size and gear limitations.

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 the GOA. In 2009, the Council took action to add gear-specific (pot, hook- and-line, or jig) Pacific cod endorsements to GOA fixed gear licenses that met a minimum catch threshold during 2002-2008. The threshold is 10 mt of Pacific cod landings for small vessels (<60 feet in length), and 50 mt for large vessels (≥60 feet in length) and catcher processors. The 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 statewide 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. Vessel registration for Pacific cod may be non-exclusive, which allows a vessel to register with ADFG to fish more than one management area (but not concurrently) within a calendar year, or exclusive, which restricts a vessel from fishing in another exclusive area but would allow a vessel to fish in a non-exclusive area. The state fisheries for Pacific cod are not closed access fisheries.

Evidence Basis:
The Council website includes a page describing the development and evolution of the Pacific cod allocation and fleet sectors.

References:

Alaska License Limitation Program https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/license-limitation-program-alaska
Annual Management Report for Groundfish Fisheries in the Kodiak, Chignik, and South Alaska Peninsula Management Areas. https://www.adfg.alaska.gov/FedAidPDFs/FMR20-26.pdf
Annual Management Report for Groundfish Fisheries in the Prince William Sound https://www.adfg.alaska.gov/FedAidPDFs/FMR21-18.pdf
NPFMC 2019a, BSAI Pacific cod Allocation Review https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Pcod/BSAIPcodAllocationReview2019.pdf

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

Evaluation Parameters

Process: *Where best scientific evidence available determines that it is necessary, there are management measures in place to ensure the economic conditions under which the fishery operates promote responsible fisheries.*

Current Status/Appropriateness/Effectiveness: *There is evidence for the general economic value of the resource and its benefit to fishermen. There is enforcement data that supports the occurrence of responsible fishing practices.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the economic conditions under which fishing industries operate promote responsible fisheries. Examples may include economic reports or enforcement data.*

Evaluation (per parameter)

Process:
As a result, and in combination with good management practices and generally favorable environmental conditions, the Alaska Pacific cod fishery has largely remained economically stable since the 1990s and fostered responsible fishing. The longer-term economic future of the fishery is also under consideration with respect to adaptation to climate change.

Current Status/Appropriateness/Effectiveness:
Enforcement reports indicate very high compliance in the Pacific cod fisheries (see Clause 10).

Evidence Basis:
Estimates of ex-vessel value by area, gear, type of vessel, and species, are included in the annual Economic Status appendix to the SAFE reports.

BSAI Pacific cod accounted for 19% of the ex-vessel value for the BSAI catcher vessels in 2020 and catches from trawl gear accounted for 37% of the BSAI Pacific cod value. BSAI trawl CV Pacific cod retained catch decreased 15% in 2020. The realized ex-vessel price of BSAI trawl Pacific cod decreased 7% to $0.346/lb.

GOA Pacific cod accounted for 5% of the ex-vessel value for the GOA CVs in 2020 and catches from trawl gear accounted for 42% of the GOA Pacific cod value. GOA trawl Pacific cod retained catch decreased 27% in 2020. The realized ex-vessel price of GOA trawl Pacific cod decreased 27% to $0.358/lb.

References:

Economic value of Alaska's seafood industry – ASMI Report: https://www.alaskaseafood.org/wp-content/uploads/MRG_ASMI-Economic-Impacts-Report_final.pdf
Economic Status Report for the Gulf of Alaska and Bering Sea/Aleutian Islands 2020: https://www.fisheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-bering-sea-aleutian-islands.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

Evaluation Parameters

Process: *There is a system or process in place that identifies the interests of small-scale fishers, either through stakeholder engagement or social research, in a way, which permits the utilization of the information during the management measure development process.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the interests of small-scale fishers are effectively taken into account during the development of management measures, and there is no evidence that small-scale fisheries are adversely impacted by any management measures currently in place.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries are taken into account. Examples may include dedicated quotas, public meeting records, laws, and regulations.*

Evaluation (per parameter)

Process:
The interest of subsistence, small-scale and artisanal fisheries are explicitly taken into account within the FMPs and, with respect to the BSAI and GOA Pacific cod fisheries, action has been taken to minimize the bycatch of halibut and salmon, as a direct consequence of its importance for subsistence and artisanal fisheries (see section 2.3 above).

Current Status/Appropriateness/Effectiveness:
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 and sub-objectives include: the promotion of sustainable fisheries and communities, the promotion of equitable and efficient use of fishery resources and increase Alaska indigenous consultation.

The fishery dependence of coastal and western Alaska communities was addressed through the creation of the pollock, sablefish, and halibut CDQ programs for the BSAI in the early to mid-1990s and the expansion of those programs into the multispecies CDQ Program with the addition of all other groundfish species by 1999. The CDQ Program has provided the following for the CDQ

communities: 1) additional employment in the harvesting and processing sectors of the groundfish fisheries; 2) training; and 3) income generated by fishing the CDQ allocations. In many cases, CDQ royalties have been used to increase the ability of the residents of the CDQ communities to participate in the regional commercial fisheries, or the CDQ has been fished by residents themselves.

In addition to this, the Council takes into account the interests of fishers, including those engaged in subsistence, small-scale, and artisanal fisheries, during management of the Pacific cod fisheries in the BSAI and the GOA (e.g., by using (PSC limits), and the Council and the industry have taken and continue to take measures to reduce salmon bycatch.

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

References:

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
Community Development Program http://www.npfmc.org/community-development-program/

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

3.2.4 Biodiversity of aquatic ecosystems shall be conserved and ETP species shall be protected. Where relevant, there shall be management objectives, and as necessary, management measures.

FAO CCRF (1995) 7.2.2
FAO Eco (2009) 28.2
FAO Eco (2011) 35.2

Evaluation Parameters

Process: *There are management measures in place specifically designed to ensure that the biodiversity of aquatic ecosystems is conserved and ETP species are protected. This shall reflect the existence of specific management objectives and measures, which are based on the best scientific evidence available.*

Current Status/Appropriateness/Effectiveness: *The management measures currently in place have been successful in meeting the management objectives. Such objectives may be outlines in overarching fisheries legislation, regulations, or management plans.*

There is no evidence that the fishery is currently having a significant adverse impact on aquatic ecosystems, and it is not putting any ETP species at risk of extinction.

***Evidence Basis:** The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that biodiversity of aquatic ecosystems is conserved and ETP species are protected. Where relevant, there are management objectives, and as necessary, management measures. Examples may include laws and regulations, fisheries management plans, and species status reports.*

Evaluation (per parameter)

Process:
The process in place for the development of management objectives to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification are set out in Clause 12.2.5 below. Measures to preserve the biodiversity of ecosystems (notably HAPCs) are considered in Clause 3.1.2 and Clauses 12.2.6-12.2.8.

The processes in place address designation of species and development of objectives and measures under the ESA and MMPA for species of note – particularly Steller sea lions and northern fur seals; short-tailed albatross, and several salmon stocks. Clause 4.2 sets out the basis of the observer program and the levels of precision available. This forms the basis of data collection directly relevant to the groundfish fisheries under assessment. This program provides comprehensive and high-quality data commensurate to the scale and intensity of the fleet component (noting that observer coverage varies between catcher processor and catcher vessels, gear type and federal and state fisheries). The Observer Program is ongoing and provides ongoing updated data on all major aspects of the fisheries, including interactions with endangered and prohibited species.

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

The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process).

Salmon are monitored through assessments carried out by ADFG. Within the groundfish fisheries, coded-wire tag recoveries are used to determine sources of fish taken in bycatches, and observer sampling protocols have improved estimates of the stock of origin (from both coded-wire tag and genetic stock assignment) of the Chinook bycatch from the pollock fishery.

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

Objectives set out in the BSAI and GOA FMPs are:

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

NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤ 1% of the marine mammal's PBR level and total fishery-related mortality < 10% of PBR. Any fishery in Category III is considered to have achieved the target levels of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that > 1% but is < 50% of the stock's PBR level, if total fishery related mortality is ≥ 10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥ 50% of PBR. No Alaska groundfish fisheries, including Pacific cod, are included in Category I.

BSAI cod fishery: Marine mammals are rarely taken incidentally in the BSAI cod fisheries; comparison of species-specific bycatch estimates with the PBR for, in particular, Steller sea lions and northern fur seal indicates that interaction with the Pacific cod fisheries is below national limits (objectives); interactions with cod would be expected to be lower still. The current Steller sea lion biological opinion concluded that the Pacific cod fisheries do not endanger the stock. Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. For marine mammals whose foraging and prey preferences overlap with the fisheries, fishery removals could potentially adversely affect the amount or distribution of prey. Accordingly, habitat essential to endangered species is identified according to regulatory requirements (ESA andMMPA). NMFS has designated 100,286 km^2 as critical habitat for Steller sea lions in the Aleutian Islands included 3 nmi no-entry zones around rookeries, prohibition of groundfish trawling within 10-20 nmi of certain rookeries, and three special aquatic foraging areas in Alaska; the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area. Northern fur seals do not consume significant amounts of cod, despite their spatial distribution overlapping with the Pacific cod fishery to some extent.

The USFWS compiles data collected for seabirds at breeding colonies throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries. Table 18 and Table 19 show numbers recorded by observers for the BSAI and GOA and provides an annual average by species (e.g., in the BSAI: northern fulmar 2,241, gulls 273, auklets 7.17; in the GOA: northern fulmar 37, gulls 10).

The cod freezer longline fishery has the highest recorded seabird bycatch of any individual fishery, mostly northern fulmars. These species are listed as ‘least concern’ on the IUCN Red List. They have a very large range and extremely large populations which appear to be trending upwards (Birdlife 2022) and are considered to be highly likely to be above biologically based limits. While most takes of short-tailed albatross (an ETP species) have occurred in the cod freezer longline fishery, mortality has never met or exceeded the ”allowable” incidental take identified in the biological opinion, in most years the take is zero. The cod longline fleet also helped pioneer the use of streamer lines and actively work with one another to keep streamer lines deployed. Research is ongoing into cryptic mortality, particularly with third and fourth wire strikes of birds.

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

GOA cod fishery: As with the BSAI fishery, direct interactions of Pacific cod gear with marine mammals is very rare. The GOA Pacific cod trawl and pot fisheries are classified as category III. Of particular concern has been the decline in the western stock of Steller sea lions. Reasons for this have been considered in the current Steller sea lion biological opinion. Several management actions were implemented by the Council to promote the recovery of Steller sea lions, including the prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

Observer Program data provide annual estimates of takes of ETP fish (salmon), seabirds and marine mammals in the BSAI and GOA Pacific cod fisheries.

Evidence Basis:
FMPs, protected species management plans, and biological opinion reviews are all supported by well-designed data-gathering programs and analyses; these are 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.

References:

Birdlife 2022 Northern Fulmar http://datazone.birdlife.org/species/factsheet/northern-fulmar-fulmarus-glacialis
Endangered Species Act 1973 (As Amended) https://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf
Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. 10.25923/a0fb-nt02.
Marine Mammal Protection: Conservation and Management https://www.fisheries.noaa.gov/topic/marine-mammal-protection/conservation-&-management
Marine Mammal Protection Act 1972 https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act
NOAA 2022b Biological opinions issued in the Alaska region https://www.fisheries.noaa.gov/alaska/consultations/section-7-biological-opinions-issued-alaska-region
Northern fur seal: Conservation and Management https://www.fisheries.noaa.gov/species/northern-fur-seal#conservation-management

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2022c Chinook salmon bycatch management in Alaska https://www.fisheries.noaa.gov/alaska/bycatch/chinook-salmon-bycatch-management-alaska
PSEIS 2015. Programmatic Supplemental Environmental Impact Statement (PSEIS) https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis
Short-tailed albatross Programmatic biological Assessment of the effects of the fisheries management plans for the BSAI and parallel state groundfish fisheries https://repository.library.noaa.gov/view/noaa/19214/noaa_19214_DS1.pdf?
Stellar Sea lion biological opinion. https://www.fisheries.noaa.gov/resource/document/biological-opinion-authorization-bering-sea-aleutian-islands-groundfish-1
Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

B. Science and Stock Assessment Activities, and the Precautionary Approach

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

FAO CCRF (1995) 7.1.9, 7.4.4, 7.4.5, 7.4.6, 8.4.3, 12.4
FAO Eco (2009) 29.1–29.3
FAO Eco (2011) 36.1, 36.3–36.5, 37.4

4.1 All significant fishery removals and mortality of the target species (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 be objectively 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 regional, and international fisheries organizations.

FAO CCRF (1995) 7.3.1, 7.4.6, 7.4.7, 12.4
FAO Eco (2009) 29.1–29.3
FAO Eco (2011) 36.1, 36.3, 36.4

Evaluation Parameters

Note: *Provision of data to relevant States and, regional, and international fisheries organizations is dependent on the nature of the stock (i.e., transboundary, shared, straddling, highly migratory and high seas stock) and the type or arrangement in place for co-management (i.e., commission, arrangement, etc.). This part of the clause does not apply in cases where stocks occur entirely in one State's EEZ or jurisdiction, and co-management with another country is not required.*

Process: *There is a process or system that allows for effective data collection (including data on retained catch, bycatch, discards, and waste) on the status of fisheries and ecosystems for management purposes. In the case of stocks fished by more than one State, this includes a system or agreement with other States to ensure mortality and removals data are available for the entirety of the biological stock. Some fisheries and/or fish stock are hard to monitor for various reasons, including remoteness of operation/distribution and complexity of fishing operations—posing particular challenges with the collection and maintenance of adequate, reliable, and current data and/or other information. Assessors shall acknowledge and explain these challenges, data collection, and maintenance to cover all stages of fishery development in accordance with applicable international standards and practices. For salmon, the assessors shall describe and present the enumeration methods (i.e., peak aerial survey, feet survey, weir count, tower, mark-recapture, sonar, etc.) utilized for all the major stocks managed by formal escapement goal in Alaska. Such summary data can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally reviews the latest 9-10 years of salmon escapements, enumeration, goal development methods, and the relative escapement goal performance.*

Current Status/Appropriateness/Effectiveness: *There are appropriate and reliable data collection and estimation methods. Reliable and accurate data are collected on retained catch, bycatch, discards, and waste (for targeted and non-targeted fisheries), and the direct and indirect impacts of the fishery on the ecosystem. Such information is disseminated to all relevant fishery management authorities. Overall, the data collection system is considered effective for the purposes of this clause if fishery scientists believe there is a high probability that the total estimated mortality is an accurate reflection of the actual total mortality across the entire biological stock. Fishery data are collected with a frequency and level of aggregation, which allows the effective and informed management of the stock. The appropriate level of aggregation will often be the stock level, but could also reflect specific habitats, gear types, sub-populations, etc. The requirements for data collection are focused on the need to assess the effects of the unit of certification on non-target stocks. Non-target catches and discards refer to species/stocks that are taken by the unit of certification other than the stock for which certification is being sought. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important, inter alia, because its capacity for supporting reliable assessment of current status and trends declines as it gets older.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that all significant fishery removals and mortality of the target species are considered by the fishery management organizations. Specifically, reliable and accurate data required for assessing the status of fishery/ies and ecosystems—including data on retained catch, bycatch, discards, and waste—are collected. Data can include relevant traditional, fisher, or community knowledge, provided their validity can*

objectively be verified (i.e., the knowledge has been collected and analyzed though a systematic, objective, and well-designed process, and is not just hearsay). Examples may include stock assessment reports, catch data, and observer data.

Evaluation (per parameter)

Process:
There is a satisfactory process to account for fishery removals and mortality of Pacific cod and all removals are considered in the assessment and management of the stocks. Reliable and accurate data are provided annually to assess the status of fisheries and ecosystems. These data including information on retained catch and bycatch in the directed fisheries by all gears and catches in the Alaskan state-managed fisheries (inside 3 nm), including subsistence fisheries. Several data reporting systems are in place to ensure timely and accurate collection and reporting of catch data. Reporting of commercial catch from both state and federally managed fisheries is done through the Catch Accounting System (CAS), a multi-agency (NMFS, 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. The CAS system also provides a centralized data platform for the collation of catch (landings and discards) data from the extensive observer program. Catch and effort are recorded through the e-landing (electronic fish tickets) system and also collected by vessel captains in logbooks.

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

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

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

Evidence Basis:
Additional details on the catch reporting and estimation processes can be found in Cahalan et al. (2014), and more information on commercial Pacific cod catches is found in the 2021 SAFE documents. Catch reports for Pacific cod in the BSAI and GOA regions for 2020 and previous years can be found on the NMFS Alaskan fisheries website (see NMFS catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings). ADFG also produces catch documentation on the state-managed Pacific cod fisheries (see http://www.adfg.alaska.gov/static/applications). During the site visit, the stakeholders stressed that COVID-19 did not affect the science and stock assessment activities or the data collection programs.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Cahalan, J., J. Gasper, and J. Mondragon. 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska, 2015 edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-286, 46 p.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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 setting management objectives, reference points, and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g., adoption of scientific advice) shall be promoted. Results of analysis shall be distributed accordingly as a contribution to fisheries conservation, management, and development.

FAO CCRF (1995) 7.4.4, 12.3, 12.13
FAO Eco (2009) 29.1, 29.3
FAO Eco (2011) 36.3, 36.5

Evaluation Parameters

Process: *There is a process or system that allows for the production, maintenance, update, and verification of statistical data to international standards. Such standards include the FAO Coordinating Working Party on Fishery Statistics Handbook of Fishery Statistical Standards. Also, there is a process for the use and distribution of research results as a basis for setting 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). Please note that stock assessment for salmon is intended as the processes that leads to enumeration, escapement goal development, and fishery management activities to meet escapement goals.*

Current Status/Appropriateness/Effectiveness: *There is evidence for the production, maintenance, updating, and review of statistical data on catch and fishing effort in the fishery under assessment. There is evidence that the best scientific evidence available is used to inform the fisheries management process. Where there is a legal requirement for the advice of scientific authorities to be adopted, this shall be viewed as conformance with this evaluation parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that timely, complete, and reliable statistics are compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices, and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly and verified through an appropriate system. The use of research results as a basis for setting management objectives, reference points, and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g., adoption of scientific advice) is promoted. Analysis results are distributed accordingly as a contribution to fisheries conservation, management, and development. Examples may include stock assessment reports and other data.*

Evaluation (per parameter)

Process:
For all Alaska Pacific cod fisheries, there is a well-established system that allows for the production, maintenance, regular update, and verification of statistical data. This system includes the CAS described in the previous section, as well as websites and detailed publications maintained by NMFS and other agencies. These processes are fully compliant with international standards such as the FAO Handbook of Fishery Statistical Standards, in that key information such as landings, areas, fleets, gear, number of fishers, etc. is collected and maintained in accessible databases.

The use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria are driven by the NPFMC management process (see: http://www.npfmc.org/fishery-management-plans/). Results of stock assessments and management decisions are well documented and available in timely fashion.

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

Evidence Basis:
Data on catches of Alaska Pacific cod are maintained and updated by NMFS and are available on their website (see https://alaskafisheries.noaa.gov/fisheries-catch-landings). The SAFE documents, for the three federal-waters Pacific cod stock components contain extensive details on the catch and other data time series used in the stock assessments, including the catches from the state-managed fisheries.

The Alaska Fisheries Information Network was established in 1997 and maintains an analytic database of both state and federal commercial fisheries data in Alaska (see http://www.akfin.org/about-akfin) relevant to the needs of fisheries scientists and other users and provides that data in usable formats. During the site visit, the stakeholders stressed that COVID-19 did not affect the science and stock assessment activities or the data collection programs.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**		**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**	**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐		Major ☐	Minor ☐	None ☒
Non-Conformance Number (if applicable):					

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

FAO Eco (2009) 30.4
FAO Eco (2011) 37.4

Evaluation Parameters

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

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

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

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that 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. Examples may include stock assessment reports and other data.*

Evaluation (per parameter)

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

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

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

Evaluation Parameters

Process: *An observer program is present. There may be cases where collection of accurate data for research and support compliance could be established without the use of observers or a formal observer scheme (i.e., inspection scheme, enforcement, port sampling, at shore inspection, voluntary or compulsory logbooks, e-logbooks or other harvester collected data, electronic monitoring [video], or bycatch surveys). The reliability and accurateness of that system(s) would need to be verified accordingly. Note also that some fisheries observer programs are designed to collect biological data and others serve mainly as a compliance or enforcement tool. This shall be considered accordingly in the overall evaluation of this clause. Assessors shall question primarily whether the required data for fisheries management are collected or if there are important data gaps (e.g., because of the absence of an observer program).*

Current Status/Appropriateness/Effectiveness: *The data collected by the observer program is considered accurate and useful.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures is established. Examples may include stock assessment, survey, observer, or other reports.*

Evaluation (per parameter)

Process:

Beginning in 2013, Amendment 86 to the FMP of the BSAI and Amendment 76 to the FMP of the GOA established the Observer Program (see https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf). This extensive observer program exists for fisheries in Alaskan waters, and observers collect the required data for fisheries management.

Current Status/Appropriateness/Effectiveness:
All vessels in federally managed or parallel groundfish fisheries off Alaska are assigned to one of two categories: 1) the full observer coverage category, where vessels and processors have at least one observer present for all fishing activity, or 2) the partial observer coverage category, where NMFS determines when and where observer coverage is needed. Observer coverage in the EBS Pacific cod fishery has been at or near 100% for the past several years, while in the GOA, lower coverage rates exist. 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. For halibut, viability (injury and condition) data are collected by observers to generate halibut discard mortality rates in Alaska groundfish fisheries.

As well as providing data for stock assessment and other scientific purposes, the observer program is also used extensively for in- and post-season management. Daily reports are electronically transmitted via the CAS system and can be used as the basis to trigger closures (e.g., if maximum catch allocations of target or Prohibited Species are caught). Annual reports from the Observer Program contain detailed information on fees and budgets, deployment performance, enforcement, and outreach. NMFS has already noted progress on incorporating variances associated with catch estimates and will continue to report as work progresses.

Evidence Basis:
Detailed annual reports from the Observer Program can be found on AFSC and NMFS websites (see https://www.fisheries.noaa.gov/resource/document/north-pacific-observer-program-2020-annual-report). Data collected by the observer program feed directly into various datasets and studies used in the stock assessments (e.g., SAFE documents). As outlined in the 2021 Observer Sampling Manual, over 400 certified groundfish observers are deployed each year on a variety of commercial fishing vessels for numerous Alaskan fisheries, including Pacific cod, providing the Observer Program with over 37,000 data collection days annually. Information on calculation of discard mortality rates for Alaska fisheries can be found in the working group report.

The Annual Report provides information, analysis, and recommendations based on the deployment of observers and EM systems by the Observer Program during 2020. Section 313 of the MSA (16 U.S.C. 1862) authorizes the Council, in consultation with NMFS, to prepare a fishery research plan for the purpose of stationing observers and EM systems to collect data necessary for the conservation, management, and scientific understanding of the commercial groundfish and Pacific halibut fisheries of the BSAI and GOA management areas. Observers and EM systems collect fishery-dependent information used to estimate total catch and disposition. Observers also collect biological and ecosystem data and interactions with, and biological samples from, protected species. Managers use these data to manage groundfish and prohibited species catch within established limits and to document and reduce fishery interactions with protected resources. Scientists use fishery-dependent data to assess fish stocks, to provide scientific information for fisheries and ecosystem research and fishing fleet behavior, to assess marine mammal interactions with fishing gear, and to assess fishing interactions with habitat.

Each year, the Annual Deployment Plan describes the science-driven method for deployment of observers on vessels in the partial coverage category (50 CFR 679.51(a)) in the Pacific halibut and groundfish fisheries off Alaska. The following year, the agency provides an Annual Report with descriptive information and scientific evaluation of the deployment of observers and EM. The Annual Deployment Plan and Annual Report process provides information to assess whether the objectives of the Observer Program have been met and a process to make recommendations to improve implementation of the program to further these objectives.

Response to COVID-19 and Program Summary:

- Starting in March 2020, the COVID-19 pandemic created limitations on available air travel and “shelter in place” restrictions, particularly in many remote Alaska communities. The situation impacted observer deployment and the agency responded in order to protect public health and to ensure the safety of fishermen and observers, while maintaining an ongoing supply of fish to markets. As a result, the Observer Program completely reengineered observer logistic processes including observer training classes, briefing, and debriefing protocols, extensions to observer deployment, and modifications to sampling protocols to minimize observers from vessels interacting with staff in processing plants.
- Under the emergency rule signed on 24 March 2020, NMFS temporarily waived the requirement for vessels in the Partial Coverage Category to carry a fishery observer starting on 26 March 2020. On 18 April 2020, NMFS announced a limited extension of the temporary waiver of observer requirements, which narrowed the scope and reinitiated deployment of observers on trips departing from the port of Kodiak, Alaska. On 30 June 2020, NMFS expanded observer deployment in the partial coverage category to include 13 ports in addition to Kodiak, which further reduced the scope of waivers issued.

- 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 and only a few trips were released from coverage under the fixed gear EM portion of the partial coverage category for circumstances when an EM service technician was unable to travel.
- Despite all of the challenges of 2020, the agency was able to safely continue many of the observer program operations. There were 373 observers that were trained, briefed, and equipped for deployment to vessels and processing facilities operating in the BSAI and GOA groundfish and halibut fisheries.
- Twenty-one Fisheries Monitoring and Analysis Division staff members completed 105 debriefings in Anchorage and 469 debriefings in Seattle; the majority of these were completed virtually.
- In 2020, observers collected data on board 259 fixed gear and trawl vessels and at 11 processing facilities for a total of 40,838 observer days (39,153 full coverage days on vessels and in plants; and 1,685 partial coverage days on vessels and plants). NMFS approved 169 vessels in the 2020 EM selection pool. Of these, 131 vessels fished at least 1 trip but not all vessels were selected to turn on their EM system. In 2020, EM data was collected from 105 unique vessels on a total of 253 trips (193 hook-and-line trips and 60 pot trips).
- Overall, for all federal fisheries off Alaska, 4,072 trips (44.8%) and 375 vessels (38.2%) were monitored by either an observer or EM system in 2020.

References:

Alaska Fisheries Science Center and Alaska Regional Office. 2021. North Pacific Observer Program 2020 Annual Report. AFSC Processed Rep. 2021-03, 143 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.Available at https://repository.library.noaa.gov/welcomeReference in this document to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

4.2.1 Where necessary, fisheries management organizations and regional fisheries management organizations and other such arrangements should strive to achieve a level and scope of observer programs sufficient to provide quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.

FAO IGBD (2011) 5.1.3

Evaluation Parameters

Process: *There is a clear system that allows the observer program, or any other appropriate data gathering system as appropriate, to provide sufficient quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.*

Current Status/Appropriateness/Effectiveness: *The data collected by the observer program is considered accurate and useful, especially for providing quantitative estimates of total catch, discards, and incidental takes of living aquatic resources.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the observer program is established and able to provide quantitative estimates of total catch, discards, and incidental takes of living aquatic resources. Examples may include stock assessment, observer, survey, or other reports.*

Evaluation (per parameter)

Process:
As mentioned in Clause 4.2, observer programs are used in Alaska fisheries. Moreover, port sampling is used extensively to collect biological samples of catches. The legal authority for this activity is spelled out in state regulations as noted above. The scope of the port sampling program varies greatly by species and region depending on need.

Current Status/Appropriateness/Effectiveness:
The Observer Program plays a vital role in the conservation and management of the BS, AI, and GOA groundfish and halibut fisheries. The program trains, briefs, debriefs, and oversees over 450 observers annually who collect catch data onboard fishing vessels and at onshore processing plants that is used for in-season management and scientific purposes such as stock assessments and ecosystem studies. The program ensures that the data collected by observers are of the highest quality possible by implementing rigorous quality control and quality assurance processes for the data collected by observers.

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

Evidence Basis:
Raw or summarized biological data as well as total catch, discards, and incidental takes of cod collected in sampling programs are routinely reported in the stock assessment forms and annual reports available (https://www.fisheries.noaa.gov/tags/north-pacific-observer-program?title=annual%20report&field_species_vocab_target_id=&sort_by=created). During the site visit, the stakeholders stressed that COVID-19 did not affect the science and stock assessment activities or the data collection programs.

References:

Alaska Fisheries Science Center and Alaska Regional Office. 2021. North Pacific Observer Program 2020 Annual Report. AFSC Processed Rep. 2021-03, 143 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.Available at https://repository.library.noaa.gov/welcomeReference in this document to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

4.3 A fisheries management organization, regional fisheries management organizations or arrangements shall compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.

FAO CCRF (1995) 7.4.6, *7.4.7*

Evaluation Parameters

Note: *Not applicable if no regional or sub-regional body is involved in fishery management between one or more countries.*

Process: *There is a system within the regional body structure that allows for data distribution in line with confidentiality requirements.*

Current Status/Appropriateness/Effectiveness: *There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that a fisheries management organization, regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures. Examples may include reports where confidentiality requirements have been affected.*

Evaluation (per parameter)

Process:
There are systems within NMFS, the Council, and ADFG management structures that allow for complete data distribution in line with confidentiality requirements.

Current Status/Appropriateness/Effectiveness:
NMFS and ADFG have extensive scientific databases, which include 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 analysis and reporting of fishery data, depending on the number of individuals or entities involved.

Evidence Basis:
Council management plans, and SAFE documents contained detailed data, which are widely disseminated, and confidentiality is maintained as necessary. The Commercial Fisheries Entry Commission (see https://www.cfec.state.ak.us/) is the designated records manager for ADFG fish ticket records. Fish ticket records are retained by the Commission for 45 years and are confidential as defined by AS 16.05.815 and 16.40.155.

References:

Alaska Fisheries Science Center and Alaska Regional Office. 2021. North Pacific Observer Program 2020 Annual Report. AFSC Processed Rep. 2021-03, 143 p. Alaska Fish. Sci. Cent., NOAA, Natl. Mar. Fish. Serv., 7600 Sand Point Way NE, Seattle WA 98115.Available at https://repository.library.noaa.gov/welcomeReference in this document to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF 12.7

Evaluation Parameters

Process: *There is research to support policies related to fish as food.*

Current Status/Appropriateness/Effectiveness: *There is evidence of this research.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State stimulates the research required to support policies related to fish as food.*

Evaluation (per parameter)

Process:
State and national policies regarding seafood are guided by the Alaska Seafood Marketing Institute (ASMI), U.S. Food and Drug Administration, U.S. Department of Agriculture, and the U.S. National Institute of Health.

Current Status/Appropriateness/Effectiveness:
Alaska supports both a Seafood Marketing Institute and the Kodiak Seafood and Marine Science Center to stimulate research and to support and distribute the benefits of seafood in human diets.

Evidence Basis:
ASMI (http://www.alaskaseafood.org) is the state agency primarily responsible for increasing the economic value of Alaska seafood through marketing programs, quality assurance, industry training and sustainability certification. ASMI's role includes conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state.

Through the University of Alaska Fairbanks, the state of Alaska also operates the Kodiak Seafood and Marine Science Center (https://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/), which directs efforts in several fields, including seafood processing technology, and seafood quality and safety. The staff work closely with the fishing industry to convey research results and provide educational opportunities that help seafood workers improve efficiency and the quality of their products.

References:

Kodiak Seafood and Marine Science Center. 2018. Annual report FY2018 (July 1, 2017–June 30, 2018). 2018. Kodiak Seafood and Marine Science Center, University of Alaska Fairbanks, College of Fisheries and Ocean, Kodiak. https://www.uaf.edu/files/cfos/Locations/kodiak/annual-report-FY18-KSMSC.pdf

Nettleton, J. 2009. Are fish and plant omega-3s the same? ASMI. Juneau, AK. https://www.ncbi.nlm.nih.gov/pubmed/1825498.

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

4.5 There shall be sufficient knowledge of the economic, social, marketing, and institutional aspects of fisheries collected through data gathering, analysis, and research, as well as comparable data generated for ongoing monitoring, analysis, and policy formulation.

FAO CCRF (1995) 7.4.5, 12.9

Evaluation Parameters

Process: *There is a system in place for collecting economic, social, marketing, and institutional knowledge of the fisheries.*

Current Status/Appropriateness/Effectiveness: *These data are used for ongoing monitoring, analysis, and policy formulation.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is sufficient knowledge of the economic, social, marketing, and institutional aspects of fisheries, that they are adequately researched, and that comparable data are generated for ongoing monitoring, analysis, and policy formulation. Examples may include reports on social/cultural/economic value of the resource.*

Evaluation (per parameter)

Process:
Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act, the MSA (http://www.nmfs.noaa.gov/sfa/magact/), the NEPA, the ESA, and other applicable laws. AFSC/NMFS Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska.

Current Status/Appropriateness/Effectiveness:
The economic and socioeconomic data collected for the Pacific cod fisheries are extensive, and data are used for ongoing analysis. These analyses include estimates of total Pacific cod and groundfish catch, discards and discard rates, PSC and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the fisheries off Alaska, and employment on at-sea processors. Annual reports contain a wide range of analyses and information on the performance of numerous indices for different sectors of the North Pacific fisheries, including Pacific cod, and relate changes in value, price, and quantity, across species, product, and gear types to changes in the market.

Evidence Basis:
Annual economic SAFE reports (e.g., Fissel et al. 2020) on social/cultural/economic value of the Alaska fisheries resources are produced, which include extensive information on the Alaska Pacific cod fisheries. This report summarizes overall industry impacts, participation, value, and exports. BSAI and GOA Pacific cod SAFE reports have extensive sections on the economic performance of the Pacific cod fisheries, and these are summarized in Section 3.1 above.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Fissel, B., M. Dalton, R. Felthoven, B. Garber-Yonts, A. Haynie, A. Himes-Cornell, S. Kasperski, J. Lee, D. Lew, A. Santos, C. Seung, K. Sparks. 2020. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. NMFS, NOAA, 7600 Sand Point Way N.E. Seattle, Washington 98115-6349. xxiv + 284 p. This report will be available at: https://www.sheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-beringsea-aleutian-islands.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 12.12

Evaluation Parameters

Process: *Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.*

Current Status/Appropriateness/Effectiveness: *Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization investigates and documents traditional fisheries knowledge and technologies—in particular those applied to small-scale fisheries—in order to assess their application to sustainable fisheries conservation, management, and development. Examples may include various fisheries reports.*

Evaluation (per parameter)

Process:
Highly developed fisheries such as those for Alaska Pacific cod incorporate broad knowledge sources into fisheries management. A stated objective in the Council FMPs is to increase Alaska Native consultation.

Current Status/Appropriateness/Effectiveness:
Most Pacific cod catches in Alaska waters are taken in large-scale operations such as C/Ps or large CVs. Smaller fisheries such as some of the state-managed ones in are effectively regulated and take into account any issues related to smaller scale localized fisheries. The Council's FMPs specifically consider an objective to increase Alaska Native consultation by a) continuing to incorporate local and traditional knowledge in fishery management; b) considering ways to enhance collection of local and traditional knowledge from communities; and c) incorporating such knowledge in fishery management where appropriate.

Evidence Basis:
All data from the state and federally managed 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.

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. Moreover, the Council is developing a Local Knowledge/Traditional Knowledge/Subsistence Taskforce in connection with the Bering Sea Fishery Ecosystem Plan.

References:

ADFG. 2021. Fishery Update 2021 Central Region Groundfish Fisheries Outlook. Alaska Department of Fish and Game P.O. Box 115526; 1255 W. 8th Street Juneau, AK 99811-5526. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/634206707.pdf.

NMFS. 2021. Fisheries Catch Reports National Marine Fisheries Service, 709 West 9th Street. Juneau, Alaska 99802. https://alaskafisheries.noaa.gov/fisheries-catch-landings.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

4.7 If a fisheries management organization is conducting scientific research activities in waters of another State, it shall ensure that their vessels comply with the laws and regulations of that State and international law.

FAO CCRF (1995) 12.14

Evaluation Parameters

Note: *If the stock is fully managed by one State and there is no need for shared stock research (between two or more States), then this clause is not applicable.*

Process: *There is a system in place to manage the conduct of research vessels operating in waters of other States.*

Current Status/Appropriateness/Effectiveness: *If a fisheries management organization is conducting scientific research activities in waters of another State, there is record of such shared research activities and they comply with required regulations.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that if a fisheries management organization is conducting scientific research activities in waters of another State, it ensures that their vessels comply with the laws and regulations of that State and international law. Examples may include survey reports.*

Evaluation (per parameter)

The stock is fully managed by the US, and the fishery occurs in the U.S. EEZ. Thus, there is no need for shared stock research with other jurisdictions and this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

4.8 Adoption of uniform guidelines governing fisheries research conducted on the high seas shall be promoted and, where appropriate, support the establishment of policies that include, *inter alia*, facilitating research at the international and sharing the research results with affected States.

FAO CCRF (1995) 12.15, 12.16

Evaluation Parameters

Note: *If the stock is fully managed by one State and there is no need for shared stock research (between two or more States), then this clause is not applicable.*

Process: *There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas.*

Current Status/Appropriateness/Effectiveness: *There is a record of uniform high seas research guidelines or a mechanism to create them.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that adoption of uniform guidelines governing fisheries research conducted on the high seas is promoted and, where appropriate, supports the establishment of mechanisms, including, inter alia, adopting uniform guidelines to facilitate research at the international level, and encouraging such research results be shared with affected States. Examples may include survey reports, or high seas guidelines.*

Evaluation (per parameter)

The stock is fully managed by the US, and the fishery occurs in the U.S. EEZ. Thus, there is no need for shared stock research with other jurisdictions and this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

4.9 If appropriate, the fisheries management organization and relevant international organizations shall promote and enhance the research capacities of developing countries, *inter alia*, in the areas of data collection and analysis, information, science and technology, human resource development, and provision of research facilities, in order for them to participate effectively in the conservation, management, and sustainable use of living aquatic resources.

FAO CCRF (1995) 12.18

Evaluation Parameters

Note: *This clause is only applicable when the unit of certification includes a transboundary, shared, straddling, highly migratory or high seas stock, which is fished by one or more developing States.*

Process: *There is a mechanism in place by which the research capacities of developing countries can be developed and enhanced. This could include, but is not limited to, the provision of personnel, equipment, funding, or cooperation on data collection and stock assessment.*

Current Status/Appropriateness/Effectiveness: *There are recognizable examples of instances in the history of the fishery under assessment where actions by the managers of the unit of certification have promoted or enhanced the research capacity of one or more developing nations in the ways described above.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that if appropriate, the fisheries management organization and relevant international organizations promote and enhance the research capacities of developing States, 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. Examples may include various data or reports.*

Evaluation (per parameter)

The stock is fully managed by the U.S., and the fishery occurs in the U.S. EEZ. There are no developing countries involved in this fishery, and thus this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

4.10 Competent national organizations shall, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished.

FAO CCRF (1995) 12.19

Evaluation Parameters

Note: *This criterion does not apply to fully developed fisheries, as defined by the FAO. The FAO definition of a developed fishery is "a fishery which, following a period of rapid and steady increase of fishing pressure and catches, has reached its level of maximum average yearly production. It is usually understood that such a fishery is yielding close to its maximum sustainable yield."*

Process: *There is a mechanism to allow a national organization to render technical and financial support to the State.*

Current Status/Appropriateness/Effectiveness: *There is a record of the provided technical and financial support.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. Examples may include various data or reports.*

Evaluation (per parameter)

This fishery meets the FAO definition of a developed fishery, and thus this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

4.11 Relevant technical and financial international organizations shall, upon request, support States in their research efforts, devoting special attention to developing countries—in particular the least developed among them and small developing island countries.

FAO CCRF (1995) 12.20

Evaluation Parameters

Note: *This clause is relevant where the fishery is within a developing region/small island region and management of the resource is performed through an international organization.*

Process: *The international management component of the fishery is engaged in processes that support the fishery based in developing countries.*

Current Status/Appropriateness/Effectiveness: *There is a record of the provided technical and financial support.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that relevant technical and financial international organizations are, upon request, supporting States in their research efforts, and are devoting special attention of developing countries—in particular the least developed among them and small island developing countries. Examples may include various data or reports.*

Evaluation (per parameter)

This fishery does not include a developing or small island region, and thus this clause is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.2.1, 12.2, 12.3, 12.5, 12.6, 12.7, 12.17
FAO Eco (2009) 29–29.3, 31
FAO Eco (2011) 42

5.1 An appropriate institutional framework shall be established to determine the applied research required and its proper use (i.e., assess/evaluate stock assessment model/practices) for fishery management purposes. FAO CCRF 12.2, 12.6

Evaluation Parameters

Process: *There is an established institutional framework for fishery management purposes that determines applied research needs and use.*

Current Status/Appropriateness/Effectiveness: *There is evidence to substantiate that essential research for fishery management purposes is determined and carried out. This research generally includes routine stock(s) and ecosystem assessment reports. Assessors shall evaluate the specific stock assessment model/practices for each of the species under assessment and verify the technical appropriateness for use. For salmon, the assessors shall present and evaluate the methods for escapement goal development utilized to develop the annual escapement goals in Alaska (about 300). Statewide summary data for Alaska can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally presents the latest 9–10 years of salmon escapement performance in review.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that an appropriate institutional framework is established to determine the applied research required and its proper use (i.e., assess and evaluate stock assessment models or practices) for fishery management purposes. Examples may include description of the overall process of research assessment and peer review, as well as stock and ecosystem assessment reports.*

Evaluation (per parameter)

Process:
Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the AFSC in Seattle, which operates several laboratories and divisions. The Auke Bay Laboratories in Alaska conduct scientific research on fish stocks, fish habitats, and the chemistry of marine environments. The Fisheries Monitoring and Analysis Division monitors groundfish fishing activities in the U.S. EEZ off Alaska and conducts research associated with sampling commercial fishery catches, estimation of catch and bycatch mortality, and analysis of fishery-dependent data. The Resource Assessment and Engineering Division conducts fishery surveys to measure the distribution and abundance of approximately 40 commercially important fish and crab stocks. The Resource Ecology and Fisheries Management Division collects data to support management of Northeast Pacific and EBS fish and crab resources, including Pacific cod, and produces an annual Economic Status Report. ADFG has a well-developed research capacity and conducts surveys and stock assessments in State waters to help determine safe harvest levels. The Council actively encourages stakeholder participation, and all Council deliberations are conducted in open, public sessions.

Current Status/Appropriateness/Effectiveness:
Peer reviewed stock assessments are done annually and used as the scientific basis to set catch quotas for the three Pacific cod stock components. The assessments take into account uncertainty and evaluate stock status relative to reference points in a probabilistic way. 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. Various biological studies and surveys which feed data into the stock assessments are reviewed as well. The SAFE reports are scientifically based, consider all available research on Pacific cod including that which is conducted in state waters and provide information to the Council for determining annual harvest specifications, documenting significant trends or changes in the stocks, marine ecosystem, and fisheries. The SAFE reports are comprehensive and publicly available. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by the CIE, and any recommendations are addressed in subsequent stock assessments.

Evidence Basis:

The NMFS/AFSC website has detailed information on Alaska Pacific cod research and stock assessment (see https://www.afsc.noaa.gov/species/Pacific_cod.php#). The SAFE reports are compiled annually by the BSAI and GOA Groundfish Plan Teams, which are appointed by the Council. As outlined in the current Council Groundfish FMPs for BSAI and GOA (http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf and https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf), scientists from the AFSC, ADFG, other agencies, and universities prepare a SAFE report annually. The SAFE report consists of three volumes: a volume containing stock assessments, one containing economic analysis, and one describing ecosystem considerations. Chapters of the assessment volume deal with each stock assessment (e.g., for each Pacific cod stock assessment). This document is reviewed first by the Council Groundfish Plan Team, then by the SSC and AP, and finally by the full Council. The review by the SSC (http://npfmc.legistar.com/gateway.aspx?M=F&ID=2705c3ce-ed5a-4ab3-9936-4cf70912ee1c.pdf) constitutes the official scientific review for purposes of the Information Quality Act. Upon review and acceptance by the SSC, the SAFE report and any associated SSC comments constitute the best scientific information available for purposes of the MSA. The GOA Pacific cod assessment was reviewed by three external reviewers from the CIE in 2018 their reports are available on the NMFS website (see https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2018). The EBS Pacific cod assessment was reviewed by three external reviewers from the CIE in 2016 and 2021 and their reports are available on the NMFS website (see https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2016 and https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2021). Recommendations from these reviews were taken into account in the 2016 EBS Pacific cod assessment, where possible.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

5.1.1 Less elaborate stock assessment methods are frequently used for small-scale or low-value capture fisheries resulting in greater uncertainty about the status of the *stock under consideration.*, A more precautionary approach to managing fisheries on such resources shall be required, including, where appropriate, a lower level of resource utilization. A record of good management performance may be considered as supporting evidence of the adequacy of the management system.

FAO Eco (2011) 42

Evaluation Parameters

Note: *If the fishery for the stock under consideration has sufficient data collected through regular stock assessment activities for its management, then this clause can be scored with full conformance.*

Process*: There is a process that allows more precautionary approaches to managing fisheries (e.g., lower exploitation rates) on resources assessed through stock assessment methods that result in greater uncertainty about the state of the stock under consideration.*

Current Status/Appropriateness/Effectiveness: *There is evidence that precautionary approaches are applied to managing fisheries (e.g., lower exploitation rates) on resources assessed through stock assessment methods that result in greater uncertainty about the state of the stock under consideration.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that with less elaborate stock assessment methods frequently used for small-scale or low-value capture fisheries, more precautionary approaches to managing fisheries on such resources are required, including where appropriate, lower level of resource utilization. Examples may include stock assessment reports and other data.*

Evaluation (per parameter)

Based on the Note in this section, the fisheries under consideration have sufficient data, as described in previous clauses, and thus this clause can be scored with full conformance.

References:

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

5.1.2 The fisheries management organization shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, and fishery enhancement. Analysis results shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence available contributes to fisheries conservation, management, and development. The fisheries management organization shall also ensure the availability of research facilities and provide appropriate training, staffing, and institution building to conduct the research.

FAO CCRF (1995) 12.1, 7.4.2

Evaluation Parameters

Process: *There are organizations and processes in place to permit research into the aspects of fisheries listed in the clause.*

Current Status/Appropriateness/Effectiveness: *Research is conducted into the following aspects of the fisheries: biology, ecology, technology, environmental science, economics, and aquaculture. The described types of research carried out shall result in the fishery being deemed compliant with this evaluation parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States are conducting appropriate research into the following aspects of the fisheries: biology, ecology, technology, environmental science, economics, and aquaculture. The research is disseminated accordingly. States also ensure the availability of research facilities and provide appropriate training, staffing, and institution building to conduct the research. Examples may include stock assessment, economic value, fleet reports, and other reports.*

Evaluation (per parameter)

Process:
Appropriate research is conducted into all aspects of Pacific cod fisheries by NMFS, ADFG, and researchers from universities and other agencies, including collaborative efforts with the fishing industry. A research plan and/or list of priorities is published in the annual SAFE document, and biology, ecology, stock assessment, and environmental science are all covered by these plans. Several broad ecosystem-wide projects provide extensive data on Alaskan stocks and environmental conditions. Economic analyses and social science are conducted by NMFS/AFSC, and ADFG.

Current Status/Appropriateness/Effectiveness:
Comprehensive research into Pacific cod biology, ecology, and environmental science is conducted by NMFS and ADFG staff, along with several other institutions. Several surveys are conducted annually or biennially in the EBS, AI, and GOA Regions which are used to derive indices of Pacific cod abundance. NMFS research plans, data gaps, and priorities are listed in the annual Pacific cod SAFE documents. Regarding socio-economic data collection, AFSC Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska. All results of research are available to the public in readily understandable fashion. Thus, the best scientific evidence is made readily available as a contribution to fisheries conservation and management. Research facilities and appropriate training are provided at several locations in Alaska.

Evidence Basis:
Extensive research, survey, and stock assessment results are described in the three Pacific cod SAFE documents from 2021. Numerous other documents are published in a variety of sources each year, containing biological and ecological studies on Pacific cod, details of stock assessment, and survey methodology and results. The three SAFE reports explicitly state that Pacific cod is not known to exhibit any special life history characteristics that would require it to be assessed or managed differently from other groundfish stocks in the BSAI or GOA.

The comprehensive Economic Status Report (see Fissel et al. 2020) provides estimates of total groundfish catch, groundfish discards and discard rates, PSC and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product, and gear types, to changes in the market. This report includes a considerable amount of economic data for the commercial Pacific cod fisheries, and a summary appears in each Pacific cod stock assessment SAFE in 2021.

The Bering Sea Project, a partnership between TNPRB and the National Science Foundation, is studying the Bering Sea ecosystem from atmospheric forcing and physical oceanography to humans and communities, as well as socio-economic impacts of a changing marine ecosystem. Scientists and researchers from a number of agencies and universities are involved. Ecosystem modelling, sound data management, and education and outreach activities are included in the program (see http://www.nprb.org/assets/images/uploads/01.10_bsag_web.pdf). An integrated GOA ecosystem project, also funded by the NPRB, is examining recruitment processes of major groundfish species.

The University of Alaska (https://www.uaf.edu/sfos/research/fisheries) provides bachelor, masters and doctoral programs in fisheries science, associate degrees and certificates in fisheries technology. University faculty supervise graduate student research on a broad array of biological topics including quantitative stock assessment, biology and ecology of marine and freshwater species, molecular genetics, and behavioral ecology. Facilities are located in Juneau, Seward, Kodiak and Fairbanks. The University of Alaska Fairbanks Kodiak Seafood and Marine Science Center (see http://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/) promotes the sustainable use of Alaska fisheries through collaborative research, application, education and information transfer. The areas of focus include seafood safety and quality, product markets and development, and bycatch reduction and environmental concerns.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Fissel, B., M. Dalton, R. Felthoven, B. Garber-Yonts, A. Haynie, A. Himes-Cornell, S. Kasperski, J. Lee, D. Lew, A. Santos, C. Seung, K. Sparks. 2020. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. NMFS, NOAA, 7600 Sand Point Way N.E. Seattle, Washington 98115-6349. xxiv + 284 p. This report will be available at: https://www.sheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-beringsea-aleutian-islands.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

5.2 There shall be established research capacity necessary to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems, (2) the status of the stock under State jurisdiction, and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration.

FAO CCRF (1995) 12.5
FAO Eco (2009) 31

Evaluation Parameters

Process: *There is a system that establishes the required research capacity needed to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems; (2) the status of the stock under State jurisdiction; and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration. Please note that climate science is complex and evolving, and the system shall recognize the ability to assess and monitor these parameters over time.*

Current Status/Appropriateness/Effectiveness: *There is evidence to demonstrate that there is sufficient research capacity in place to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems, (2) the status of the stock under consideration, and (2) the impacts of fishing activity, pollution, or habitat alteration.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is established research capacity necessary to assess and monitor (1) the effects of climate or other environmental change on stocks and aquatic ecosystems, (2) the status of the stock under State jurisdiction, and (3) the impacts of ecosystem changes resulting from fishing activity, pollution, or habitat alteration. Examples may include stock, ecosystem, and habitat assessment reports.*

Evaluation (per parameter)

Process:
The NMFS, ADFG, and University of Alaska maintain established research programs to monitor the state of the Pacific cod stocks and effects of fishing, pollution, habitat alteration and climate change.

Current Status/Appropriateness/Effectiveness:
The Council receives comprehensive presentations on the status of Alaska's marine ecosystems (GOA and BS) at its SSC and AP meetings, as part of its annual management process for Alaskan groundfish. These are prepared and presented by NMFS scientists and contain report cards which look at a wide range of environmental and ecosystem variables, such as physical and environmental trends, zooplankton biomass, predator and forage species biomass, and seabird and marine mammal data. EFH is identified for managed fish species, including Pacific cod. Climate-enhanced multi-species stock assessment for walleye pollock, Pacific cod, and arrowtooth flounder in the South EBS is also carried out routinely since 2016.

Evidence Basis:
Alaska's Pacific cod stock assessment programs (NMFS, ADFG) are extensive and comprehensive, and documented in the annual SAFE process. They contain regular updates of stock status, including how each stock is positioned relative to precautionary approach reference points. Ecosystem considerations are presented in each SAFE assessment report. In addition, comprehensive ecosystem reports for EBS (Ortiz and Zador 2021), AI (Siddon, 2021), and GOA (Ferriss and Zador, 2021) are presented to the Council annually, which look at numerous elements of the Alaska ecosystems. Each SAFE document for Pacific cod has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem. Finally, the Climate-enhanced multi-species stock assessment for walleye pollock, Pacific cod, and arrowtooth flounder in the south EBS is available for 2021 (Holsman et al. 2021).

NMFS identifies habitats essential for managed species and conserves habitats from adverse effects on those habitats. These habitats are termed EFH and are defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity". 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 (see http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/).
The Oil Spill Recovery Institute produces an annual report, among other publications (https://osri.us/resources/docs/). The 2021 report (https://osri.us/wp-content/uploads/2022/03/FY21-Annual-report.pdf) contains details on their activities, including ongoing research projects, an update of field guide for oil spill response in arctic waters, and shore-zone mapping of the eastern AI.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B.E. and Zador, S. 2021. Ecosystem Status Report 2021: Gulf of Alaska, Stock Assessment and Fishery Evaluation Report, North Pacic Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Fissel, B., M. Dalton, R. Felthoven, B. Garber-Yonts, A. Haynie, A. Himes-Cornell, S. Kasperski, J. Lee, D. Lew, A. Santos, C. Seung, K. Sparks. 2020. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. NMFS, NOAA, 7600 Sand Point Way N.E. Seattle, Washington 98115-6349. xxiv + 284 p. This report will be available at: https://www.sheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-beringsea-aleutian-islands.

Holsman, K. K., Jim Ianelli, Kerim Aydin, Grant Adams, Kelly Kearney, Kalei Shotwell, Grant Thompson, and Ingrid Spies 2021. Climate-enhanced multi-species Stock Assessment for walleye pollock, Pacific cod, and arrowtooth flounder in the South Eastern Bering Sea. Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 7600 Sand Point Way N.E., Seattle, Washington 98115. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSmultispp.pdf.

Ortiz, I. and Zador, S. 2021. Ecosystem Status Report 2021: Aleutian Islands, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Siddon, E. 2021. Ecosystem Status Report 2021: Eastern Bering Sea, Stock Assessment and Fishery Evaluation Report, North Pacificc Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 12.7

Evaluation Parameters

Process: *There is cooperation or interaction between international organizations to ensure optimum utilization of resource.*

Current Status/Appropriateness/Effectiveness: *There is evidence available to substantiate that such cooperation or interaction has taken place. There is data available that substantiates cooperation activities.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management organizations cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. Examples may include outputs resulting from meetings or other research.*

Evaluation (per parameter)

Process:
The U.S. 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.

Current Status/Appropriateness/Effectiveness:
The North Pacific Marine Science Organization is an intergovernmental scientific organization, was established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, People's Republic of China, Republic of Korea, the Russian Federation, and the United States of America. Its scientific program named FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is an integrative program undertaken by the member nations and affiliates of the North Pacific Marine Science Organization to understand how marine ecosystems in the North Pacific respond to climate change and human activities. The Climate Change and Carrying Capacity Program was the first major interdisciplinary initiative undertaken by the North Pacific Marine Science Organization. The ultimate goal of the Climate Change and Carrying Capacity Program is to forecast the consequences of climate variability on the ecosystems of the subarctic Pacific.

The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off

the West Coast. Representatives from Canadian and American state and federal agencies continue to meet annually to exchange information and to identify data gaps and information needs for groundfish stocks of mutual concern from California to Alaska. Not all of these are transboundary stocks (e.g., 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 TSC report that is published online. The TSC reviews agency reports and recommends collaborative work or plans workshops on topics of shared interest, such as survey methodology, tagging programs, electronic data capture, and fish ageing.

Evidence Basis:
The North Pacific Marine Science Organization website can be found here (https://meetings.pices.int/members/scientific-programs), and the TSC website can be found here (http://www.psmfc.org/tsc2). NMFS scientists from Alaska (e.g., Auke Bay Laboratories) maintain collaborative ties with researchers from many international agencies and institutions (North Pacific Marine Science Organization 2021).

References:

North Pacific Marine Science Organization, 2021. Annual Report 2021. PICES 2021 Virtual Annual Meeting. https://meetings.pices.int/publications/annual-reports/2021.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 12.7, 12.17

Evaluation Parameters

Note: *Not applicable if stock in not transboundary, shared, straddling, highly migratory or high seas in nature.*

Process: *The collaborative technical and research programs to improve understanding of the biology, environment, and status of transboundary aquatic stocks have been developed.*

Current Status/Appropriateness/Effectiveness: *There is evidence available to substantiate that such cooperation or interaction has taken place. There are data on collaborative programs to improve understanding of transboundary, shared, straddling, highly migratory or high seas stocks.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organizations directly, or in conjunction with other States, have developed collaborative technical and research programs to improve*

understanding of the biology, environment, and status, of transboundary, shared, straddling, highly migratory or high-seas stocks. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)

Not applicable as the Pacific cod stocks are not transboundary in nature.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**		**Overall score**
	10	- (	x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐		High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**	**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐	None ☐
Non-Conformance Number (if applicable):				

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.

FAO CCRF (1995) 12.3

Evaluation Parameters

Process: *There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.*

Current Status/Appropriateness/Effectiveness: *There is evidence data was properly analyzed. Data was published respecting, where appropriate, confidentiality agreements. The rules of confidentiality are effectively respected.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that data generated by research is analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate. Examples may include various data or reports.*

Evaluation (per parameter)

Process:
There is a well-defined public process, coordinated by the Council, NFMS, and ADFG that allows extensive analysis of research and relevant commercial fisheries data, ensuring their confidentiality when necessary.

Current Status/Appropriateness/Effectiveness:
As documented in some previous clauses, extensive scientific data from various sources are analyzed and presented in peer reviewed meetings and/or in primary literature, following scientific protocols. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on websites of various agencies, in order to contribute to Pacific cod fisheries conservation and management. Confidentially is required by Alaska statute and data is redacted in reports when necessary.

Evidence Basis:
The Pacific cod assessments as documented in the SAFE reports contain the necessary stock assessment data and analyses, as well as various research projects. 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 and/or CPUE data) is fully respected where necessary, such as when very few individuals are involved in a particular fleet segment. By Alaska Statute (16.05.815 Confidential Nature of Certain Reports and Records), except for certain circumstances, all records obtained by the state concerning the landing of fish, shellfish, or fishery products and annual statistical reports of fishermen, buyers, and processors may not be released. To ensure confidentiality, fishery data are routinely redacted from reports if data for a particular time, area, or gear were obtained from a small number of participants. Moreover, NMFS also has an obligation to protect confidential info (e.g., NOAA Administrative Order 216-100).

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2–29.2bis, 29.6, 30–30.2
FAO Eco (2011) 36.2, 36.3, 37, 37.1, 37.2

6.1 The fishery management organization shall establish safe target reference point(s) for management. Management targets are consistent with achieving maximum sustainable yield (MSY), a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid adverse impacts on dependent predators.

FAO Eco (2009) 29.2
FAO Eco (2011) 36.3

Evaluation Parameters

Process: *A target reference point(s) or proxy has been officially established. Managers shall be able to apply technical measures to reduce fishing pressure in the event that reference points are approached or exceeded.*

Current Status/Appropriateness/Effectiveness: *The official target reference point or proxy is consistent with achieving maximum sustainable yield (MSY), a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid severe adverse impacts on dependent predators (e.g., recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. Furthermore, there is evidence that the target reference point/management target has been used as an objective by the management process. If there are historical instances of the reference point being approached or exceeded, managers have taken remedial action as appropriate. In the context of reference points, when data are insufficient to estimate reference points directly, other measures of productive capacity can serve as reasonable substitutes or proxies. Suitable proxies may include, for example, standardized Catch per Unit of Effort (CPUE) as a proxy for biomass; or specific levels of fishing mortality and biomass, which have proven useful in other fisheries, can be used with a reasonable degree of confidence in the absence of better defined levels. It is important to note that the use of a proxy may involve additional uncertainty, and if so, should trigger extra precaution in setting biological reference points. For salmon, escapement goals are the equivalent of a target reference point proxy.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that target reference points have been established and are consistent with achieving MSY, a suitable proxy, or a lesser fishing mortality—if that is optimal in the circumstances of the fishery (e.g., multispecies fisheries) or is needed to avoid severe adverse impacts on dependent predators. Examples may include stock assessment reports or fishery management plans.*

Evaluation (per parameter)

Process:
National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. Target reference points for biomass and F (harvest rate) have been developed for Pacific cod within the Council precautionary approach management system based on sound scientific analyses. Also, an optimal yield reference point has also been established for each sum of all yields in the GOA and BSAI. Managers can apply technical measures to reduce F if reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness:
The status of U.S. fish stocks is determined by 2 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. 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. The Council 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). The BSAI and GOA groundfish fishery management plans 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.

In Tiers 1-3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. Most of the larger and commercially important stocks under Council management are in Tier 3, which has sufficient information to determine surrogates for MSY-based reference points. The term “FX%” refers to the F rate associated with an equilibrium level of spawning per recruit equal to X% of the equilibrium level of spawning per recruit in the absence of any fishing. For Tier 3, the term B40% refers to the long-term average biomass that would be expected under average recruitment and F=F40%. These 2 metrics can thus be considered as targets. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so although MSY cannot be estimated with confidence, the MSY proxy level is defined as B35% and the MSST level is one-half of B35%. Note that Tier 3 is split into three components, based on biomass level, and that the HCR specifies a decline in F when the stock biomass drops below the target level of B40% rather than at B35%.

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 (spit into Western, Central, and Eastern allocations), and regulations are spelled out by BOF.

Tier 1 Information available: reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY}.
- 1a) Stock status: $B/B_{MSY} > 1$
  $F_{OFL} = mA$, the arithmetic mean of the pdf
- 1b) Stock status: $\alpha < B/B_{MSY} \leq 1$
  $F_{OFL} = mA \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
- 1c) Stock status: $B/B_{MSY} \leq \alpha$
  $F_{OFL} = 0$

Tier 2 Information available: reliable point estimates of B, B_{MSY}, F_{MSY}, $F_{35\%}$, and $F_{40\%}$.
- 2a) Stock status: $B/B_{MSY} > 1$
  $F_{OFL} = F_{MSY}$
- 2b) Stock status: $\alpha < B/B_{MSY} \leq 1$
  $F_{OFL} = F_{MSY} \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
- 2c) Stock status: $B/B_{MSY} \leq \alpha$
  $F_{OFL} = 0$

Tier 3 Information available: reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.
- 3a) Stock status: $B/B_{40\%} > 1$
  $F_{OFL} = F_{35\%}$
- 3b) Stock status: $\alpha < B/B_{40\%} \leq 1$
  $F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$
- 3c) Stock status: $B/B_{40\%} \leq \alpha$
  $F_{OFL} = 0$

Tier 4 Information available: reliable point estimates of B, $F_{35\%}$, and $F_{40\%}$.
  $F_{OFL} = F_{35\%}$

Tier 5 Information available: reliable point estimates of B and natural mortality rate M.
  $F_{OFL} = M$

Tier 6 Information available: reliable catch history from 1978 through 1995.
  OFL = the average catch from 1978 through 1995, unless an alternative value is established by the SSC on the basis of the best available scientific information

The above text table, taken from the Council FMP for BSAI Groundfish, shows the tier system and HCRs used to determine FOFL. A similar table exists for FABC calculation in the FMP, and the portion relevant to Tier 3 stocks is as follows:

Tier 3 Information available: reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.
- 3a) Stock status: $B/B_{40\%} > 1$
  $maxF_{ABC} = F_{40\%}$
- 3b) Stock status: $\alpha < B/B_{40\%} \leq 1$
  $maxF_{ABC} = F_{40\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$
- 3c) Stock status: $B/B_{40\%} \leq \alpha$
  $maxF_{ABC} = 0$

Evidence Basis:
The BSAI and GOA groundfish FMPs contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the reference points. Extensive analysis (e.g., a series of standard projections) is conducted in each stock assessment to determine the current and projected biomass level relative to the MSY-based target reference points. SSB projected for 2022 for EBS, GOA, and AI Pacific cod stocks (Tier 3a and Tier 5) was above the B40% reference point, placing the stocks in Tier 3a. Biomass for AI Pacific cod was above the OFL level in 2021 (Tier 5). 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. For the Tier 3 stocks, the additional determinations could be made that neither stock was overfished or approaching an overfished condition.

The biological reference points have evolved over the past 20 years. In 1996, the Council redefined OFL and ABC, partly to facilitate more conservative, risk-averse management measures when stock size and mortality rates are not fully known (with the consequence that annual TACs were reduced for many stocks or stock complexes). As presented before, stocks determination is prescribed through a set of six tiers based on the availability of various types of information. “Data-rich” and “data poor” are relative terms not actually used in the FMP because the variability in the availability and quality of the data is substantial.

Data-rich stocks (as Pacific cod in EBS and GOA) are considered those for which data are sufficient to apply age-structured modelling and have some estimate of unfished biomass (i.e., Tiers 1-4; Tier-2 and Tier-4 stocks are not present in the BSAI management area). Data-poor stocks are those where the unfished biomass cannot be estimated and catch limits are set using survey biomass estimates or historical catch data (i.e., Tiers 5-6). For many groundfish stocks, F40% is used as a reference point in the ABC control rule. For Tier 3 stocks, where B. B40%, F40% is the upper limit on F_{ABC} and F35% is the FOFL.

For stocks for which sufficient data exist to assess current biomass (B) relative to BMSY or B40% (the long-term average biomass that would be expected under average recruitment and F = F40%), the control rules reduce the allowable F when B falls below BMSY (Tiers 1 and 2) or B40% (Tier 3). This serves to accelerate the rate of rebuilding should a stock fall to a low level of abundance.

A peer review of the Council harvest strategy for single stocks concluded that the strategy was conservative and that the associated accountability measures were successful in keeping commercial harvests within the TACs (Goodman et al. 2002). This precautionary, single-species approach is gradually developing into a more comprehensive ecosystem-based approach (see Aydin et al. 2007).

References:

Aydin, K., Gaichas, S., Ortiz, I., Kinzey, D., and Friday, N. 2007. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. US Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-178. 298 pp.

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Goodman, D., Mangel, M., Parkes, G., Quinn, T., Restrepo, V., Smith, T., and Stokes, K. 2002. Scientific Review of the Harvest Strategy Currently Used in the BSAI and GOA Groundfish Fisheries Management Plans. http://www.alaskafisheries.noaa.gov/npfmc/ misc_pub/f40review1102.pdf, 138 pp.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O’Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

6.2 The fishery management organization shall establish appropriate 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; RFM v2.1 Guidance Appendix 1, Part 1[4]). 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.

Evaluation Parameters

Process: *A scientifically based limit reference point or proxy has been officially established, and together with the measure to be taken, ensures the reference point(s) will not be exceeded.*

Current Status/Appropriateness/Effectiveness: *The stock under assessment shall not currently be overfished (see glossary) according to the best scientific evidence available. The stock is currently estimated to be on the sustainable side of this reference point (e.g., spawning stock biomass is above the limit reference point, F is below F_{lim}, etc.). F_{lim} shall not exceed Fmsy. The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. There are mechanisms in place (e.g., harvest control rule or mechanism) to ensure that the level of fishing pressure is reduced if the limit reference point is approached or reached, and these mechanisms are consistent with ensuring to a high degree of certainty that the limit reference point will not be exceeded, and that actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. The level of B_{lim} should be set on the basis of historical information, applying an appropriate level of precaution according to the reliability of that information. In addition, an upper limit should be set on fishing mortality, F_{lim}, which is the fishing mortality rate that, if sustained, would drive biomass down to the B_{lim} level. It is important to clarify that for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance over a 4- to 5-year period shall be considered a suitable minimum reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals for a sustained period (over 4–5 years) shall be appropriately managed within the stock of concern framework by the State of Alaska to ensure stocks are managed with the objective of returning them to safe biological targets.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are established safe limit reference point(s) for exploitation (i.e., consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures are taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. Examples may include stock assessment reports or fishery management plans.*

Evaluation (per parameter)

Process:
National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. If the exploitation level (or F) exceeds the FOFL limit, the stock is considered to be subject to overfishing. If the stock size is below the MSST threshold it is considered to be overfished, and a rebuilding plan is called for. Limit reference points for biomass and F (harvest rate) have also been developed for Pacific cod within the Council precautionary approach management system based on sound scientific analyses. An OY reference point has also been established for each sum of all yields in the GOA and BSAI. Managers can apply technical measures to reduce F if reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness:
In the Council tier system, the Pacific cod stocks in EBS and GOA are currently managed under Tier 3, while AI. Pacific cod is in Tier 5. Stocks in Tier 3 are further categorized as (a), (b), or (c) based on the relationship between biomass, B40%, and a lower biomass limit, as indicated in the table in Clause 6.1. The category assigned to a stock determines the method used to calculate ABC and OFL. The HCR is biomass-based, for which F is constant when biomass is above the B40% target and declines linearly down to the threshold value when biomass drops below the target, consistent with the precautionary approach. Below the limit specified in Tier 3c, the F rate (FOFL) used to set the OFL is set to zero. The rule used to determine the ABC is applied in exactly the same manner (i.e., based on a HCR triggered by targets and limits) and below the limit, maxFABC (F) is set to zero. Note that the MSST threshold used to determine if a stock is overfished is a different reference point than those used in the NPFMC tier system. An incorrect interpretation of this reference point relative to the HCR in the Council tier system was presented in Clause 6.1 of the previous RFM surveillance audit for this stock. The Council Groundfish FMPs for GOA and BSAI Regions also define a B20% threshold as follows: “For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed

[4] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

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".

Evidence Basis:
The BSAI and GOA groundfish fishery management plans referenced above contain the details on the Council precautionary approach, including the tier system, the HCR, and the limit and target reference points. GOA and EBS Pacific cod are both in tier 3a (biomass > B40%), and AI is in Tier 5. For the Tier 3 stocks, projections carried out with various harvest scenarios are conducted in each stock assessment to determine the current and projected biomass level relative to the limit reference points. Based on the information in the 2021 SAFE documents (i.e., position of the current and projected stock size relative to reference points), none of the GOA or EBS stocks were below the MSST limit for biomass (1/2B35% for Tier 3 stocks), and thus were not overfished, were not approaching an overfished condition, and F was below FOFL and thus did not have overfishing occurring. The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. The Council FMPs state that if a stock is determined to be overfished, an FMP amendment or regulations will be implemented to rebuild the stock or stock to the MSY level within a specified time period. This would include determining an FOFL and FMSY that will rebuild the stock within an appropriate time frame.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

6.3 Data and assessment procedures that measure the position of the fishery in relation to the reference points shall be established. 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, and taking into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing (RFM v2.1 Guidance Appendix 1, Part 1[5]).

FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2–29.2bis, 29.6, 30–30.2FAO Eco (2011) 36.2, 36.3, 37, 37.1, 37.2

[5] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Evaluation Parameters

Process: *Data and assessment procedures (i.e., stock assessment process) are in place to measure the position of the fishery in relation to the target and limit reference points.*

Current Status/Appropriateness/Effectiveness: *The current stock status in relation to reference points is used to determine the level of fishing permitted. The latter is commensurate with the current state of the fishery resources (i.e., close to or above target reference point and most importantly, not overfished or at or below its limit reference point or proxy) and takes into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing. The stock is positioned at or above the target reference point. As a minimum, the stock is located above the midway point between the target and the limit reference point. It is important to clarify that, for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance over a 4- to 5-year period shall be considered as a suitable minimum reference point for salmon management. Underperforming salmon stocks that do not meet their escapement goals for a sustained period (over 4– 5 years) shall be appropriately managed within the stock of concern framework by the State of Alaska to return them to safe biological targets. Assessors shall present evidence and evaluate escapement goals and escapement goal performance (i.e., met, not met) for all the wild salmon stock with a formal escapement goal in force in Alaska (about 300 annually). Overall, statewide summary data for Alaska can be found in the annually released ADF&G document Summary of Pacific salmon escapement goals in Alaska with a review of escapements from [year] to [year]. The document generally presents the latest 9–10 years of salmon escapement performance in review.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that data and assessment procedures are installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration is not overfished (i.e., it is above limit reference point or proxy) and the level of fishing permitted is commensurate with the current state of the fishery resources—maintaining its future availability and taking into account that long-term changes in productivity can occur due to natural variability and/or impacts other than fishing. Examples may include stock assessment reports or fishery management plans.*

Evaluation (per parameter)

Process:
NMFS/Council has an extensive peer reviewed stock assessment program, which is necessary to monitor and measure the status of the Pacific cod stocks relative to target and limit levels of exploitation and biomass. Extensive oceanographic monitoring and ecosystem modelling is done on stocks in Alaskan waters as part of a number of projects, in order to monitor and predict changes of stock productivity.

Current Status/Appropriateness/Effectiveness:
Each 2021 SAFE report for Pacific cod describes the current F rate, and stock biomass relative to the target and limit reference points. The Council FMPs specify the OFL and the F rate (FOFL) used to set OFL, Acceptable Biological Catch (ABC), and the F rate (FABC) used to set ABC, the determination of each being dependent on the knowledge base for each stock. The GOA and EBS stocks are well above the B35% (MSY proxy) and B40% reference points, and therefore above MSST (defined as 1/2B35%). None of these stocks is overfished, has overfishing occurring, or is approaching an overfished condition. AI Pacific cod does not have overfishing occurring, which is the only metric used for Tier 5 stocks.

Extensive oceanographic monitoring is carried out in conjunction with the various surveys in Alaskan waters, as described in Clause 4. Monitoring of the Pacific Decadal Oscillation regimes, a standard indicator of productivity in the north Pacific, is conducted, along with analyses of its potential impacts on productivity of North Pacific stocks. Annual Ecosystem Reports for BSAI and GOA are presented to the Council.

Evidence Basis:
The SAFE documents provide full analyses of the status of Pacific cod stocks relative to all available reference points. The tables in Section above, taken directly from the 2021 SAFE reports for each Pacific cod assessment, show the stock status in tabular form for each stock. Extensive details on the projections carried out under different harvest scenarios to determine the overfished/overfishing status for both EBS and GOA Pacific cod are also contained in the SAFE documents. In addition, comprehensive Ecosystem and Multispecies Reports for EBS, AI, and GOA are presented to NPFMC annually, which look at numerous elements of the Alaska Ecosystems. Each SAFE document for Pacific cod has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B.E. and Zador, S. 2021. Ecosystem Status Report 2021: Gulf of Alaska, Stock Assessment and Fishery Evaluation Report, North Pacic Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Fissel, B., M. Dalton, R. Felthoven, B. Garber-Yonts, A. Haynie, A. Himes-Cornell, S. Kasperski, J. Lee, D. Lew, A. Santos, C. Seung, K. Sparks. 2020. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. NMFS, NOAA, 7600 Sand Point Way N.E. Seattle, Washington 98115-6349. xxiv + 284 p. This report will be available at: https://www.sheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-beringsea-aleutian-islands.

Holsman, K. K., Jim Ianelli, Kerim Aydin, Grant Adams, Kelly Kearney, Kalei Shotwell, Grant Thompson, and Ingrid Spies 2021. Climate-enhanced multi-species Stock Assessment for walleye pollock, Pacific cod, and arrowtooth flounder in the South Eastern Bering Sea. Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 7600 Sand Point Way N.E., Seattle, Washington 98115. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSmultispp.pdf.

Ortiz, I. and Zador, S. 2021. Ecosystem Status Report 2021: Aleutian Islands, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Siddon, E. 2021. Ecosystem Status Report 2021: Eastern Bering Sea, Stock Assessment and Fishery Evaluation Report, North Pacic Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

6.4 Management actions shall be agreed to in the eventuality that data sources and analyses indicate that these reference points have been exceeded. Accordingly, contingency plans shall be agreed in advance to allow an appropriate management response to serious threats to the resource as a result of overfishing, adverse environmental changes, or other phenomena that may have adverse e on impacts on the fishery resource (RFM v2.1 Guidance Appendix 1, Part 2[6]). Such measures may be temporary and shall be based on best scientific evidence available.

FAO CCRF (1995) 7.5.3, 7.5.5
FAO Eco (2009) 29.6, 30.2
FAO Eco (2011) 36.3

[6] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Evaluation Parameters

Process: *There is an agreed process, system, or contingency plan in the eventuality that the data sources and analyses indicate that these reference points have been exceeded—detailing the appropriate management response to serious threats to the resource because of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource. Accordingly, the contingency plan/harvest control rule shall be agreed in advance to allow an appropriate management response to serious threats to the resource because of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource.*

Current Status/Appropriateness/Effectiveness: *In the eventuality that the current level of the stock has exceeded target or limit reference points, the agreed and corresponding management action (as directed by the harvest control rule or framework) shall be immediately implemented and fishing reduced or halted as necessary. The harvest control rule is effective at keeping or bringing back the stock to acceptable and safe biological levels (i.e., to avoid overfishing/ed status). Underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the stock of concern framework by the State of Alaska.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that management actions are agreed should data sources and analyses indicate that these reference points have been exceeded. Accordingly, contingency plans are agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing, adverse environmental changes, or other phenomena that may have adverse impacts on the fishery resource. Such measures may be temporary and are based on best scientific evidence available. Examples may include stock assessment reports or fishery management plans.*

Evaluation (per parameter)

Process:
The Council has developed HCRs that call for specific management actions when reference points have been exceeded.

Current Status/Appropriateness/Effectiveness:
The Council management of Pacific cod stocks includes HCR based on the reference points described in the previous 2 clauses. This HCR triggers actions by managers to reduce catches when the stock is below B40% (i.e., in Tier 3b between B40% and the lower limit specified in Tier 3c) or to set FOFL to 0 when the biomass is below the limit specified in Tier 3c. If the stock is determined to be below the MSST (defined as ½ of B35%), a rebuilding plan must be established to bring the biomass back to the BMSY level within a specified timeframe. A limit at B20% also exists, as stated in the FMPs: “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”. Catch limits for the Pacific cod stocks are based on the stock assessments and HCRs, and the HCRs have been successful in avoiding overfishing.

Evidence Basis:
The BSAI and GOA groundfish fishery management plans referenced above contain the details on the Council precautionary approach, including the tier system, the HCR, and the limit and target reference points. Extensive analysis is conducted in each stock assessment to determine the current and projected biomass level relative to the reference points, and to advise on the various catch levels appropriate to the HCRs. At present, the stocks are all well above the MSST values (not overfished), and the current ABCs for GOA and EBS Pacific cod were set based on the stocks being above B40% (i.e., in Tier 3a). For AI Pacific cod, biomass was above the OFL.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O’Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

6.5 Measures shall be introduced to identify and protect depleted stocks and those stocks 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 stocks, which have received adverse impacts by fishing or other human activities, are restored.

FAO CCRF (1995) 7.6.10 FAO Eco (2009) 30

Evaluation Parameters

Process: *There is a process that identifies depleted stocks, resources, and habitats. A depleted stock is usually a stock, which has been overfished, the stock status is below limit reference point, and the ability of the stock to recover has been impaired.*

Current Status/Appropriateness/Effectiveness: *There is evidence that where depleted or adversely impacted stocks, resources, and habitats have been identified, efforts have been made to ensure they are restored or allowed to recover (i.e., ideally within a two generations timescale). Underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the stock of concern framework by the State of Alaska.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that measures are introduced to identify and protect depleted stocks and those stocks threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts are made to ensure that resources and essential habitats critical to the wellbeing of the stocks, which have been adversely impacted by fishing or other human activities, are restored. Examples may include laws and regulations, fishery management plans, and stock assessment reports.*

Evaluation (per parameter)

Process:
Past management responses have been effective as indicated in Section 3.3. Historically the fishing intensity has been low, and the biomass has been high.

Current Status/Appropriateness/Effectiveness:
As evidenced in previous Clause 6.4, the Council management of Pacific cod stocks includes HCR based on the reference points. This HCR triggers actions by managers to reduce catches when the stock is below a certain level of biomass. In addition, the FMPs implement gear restrictions and area closures to help reduce bycatch and impacts on habitat, which are essential areas critical to the safety of the stock.

Evidence Basis:

SAFE reports and FMPs are evidence that specific measures were introduced for Pacific cod stocks to facilitate the sustained recovery of such stocks. In addition, area closures ensure that resources and habitats critical to the well-being of such stocks are protected (see https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareasoutheast.cod_managementareas_map).

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

7. Management actions and measures for the conservation of stock and the ecosystem shall be based on the precautionary approach. Where information is deficient a suitable method using risk management shall be adopted to consider uncertainty.

FAO CCRF (1995) 7.5.1, 7.5.4, 7.5.5, 12.3
FAO Eco (2009) 29.6/32
FAO Eco (2011) 36.7

7.1 The precautionary approach shall be applied widely to conservation, management, and exploitation of ecosystems to protect them and preserve the ecosystem. This should take due account of fishery 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 management, including those associated with the use of introduced or translocated species.[7]

FAO Eco (2009) 29.6
FAO Eco (2011) 36.7

Evaluation Parameters

Process: *There are management measures, regulations, and laws that command or direct the use of the precautionary approach (PA) for conservation, management, and exploitation of the aquatic resources under assessment. This could either take the form of an explicit commitment to the application of the PA or be evidenced by an overarching approach applied throughout the management literature.*

Current Status/Appropriateness/Effectiveness: *The FAO Guidelines for the PA for fisheries management (FAO CCRF 1995) advocate a comprehensive management process that includes data collection, monitoring, research, enforcement, and review. More specifically, prior identification of desirable (target) and undesirable (limit) reference points must be carried out, and measures are required that will avoid undesirable outcomes with high probability and correct them promptly should they occur. The guidelines suggest that this be achieved through rules that specify in advance what action should be taken when specified deviations from operational targets are observed (i.e., harvest control rules). Furthermore, the guidelines suggest that a management plan should not be accepted until it has been shown to perform effectively in terms of its ability to avoid undesirable outcomes (for example through simulation trials). Lastly, the absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent predator, or non-target species and their environment (https://www.sciencebase.gov/catalog/item/50538887e4b097cd4fce2446). There is evidence for the practical application of the PA for resource management and conservation. Note that the PA may be integrated into stock assessment practices, specific management measures enacted for everyday fisheries operations, or other measures. Application of the PA considers enhanced fisheries (e.g., at the policy level) where appropriate, and relevant uncertainties are considered using a suitable method of risk management (e.g., evaluation of potential impacts of increased hatchery releases on wild salmon), including that associated with the use of introduced or translocated species.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the PA is applied to conservation, management, and exploitation of an ecosystem to protect them and preserve the ecosystem. Examples may include stock assessment reports, fishery management plans and other documents.*

Evaluation (per parameter)

Process:
Precautionary approach-based reference points are used in the management of Alaska Pacific cod stocks and are stated in the Council FMPs for the GOA and BSAI regions. Scientific information and stock assessments available are at a consistently high level, and clearly provide the necessary basis for conservation and management decisions. Uncertainties are taken into account in the stock assessment process, in the establishment of reference points, and risk assessment is used in providing harvest options.

Current Status/Appropriateness/Effectiveness:
Precautionary approach-based reference points are used in the management of the Pacific cod stocks, as described extensively in Clause 6. The scientific information and stock assessments available (as described in Clauses 4 and 5) are at a consistently high level and provide the necessary basis for conservation and management decisions. Scientific advice for management of the stocks is presented for different harvest levels which explains the risk of biomass levels being below the adopted reference points. State-

[7] FAO Technical Guidelines for Responsible Fisheries No. 2 – Precautionary approach to capture fisheries and species introductions. http://www.fao.org/docrep/003/w3592e/w3592e00.htm

managed Pacific cod fisheries have some stock assessment-based reference points, and/or make use of adjacent federal-based reference points and precautionary approaches where possible.

Evidence Basis:
The reference points are established by the Council tier system precautionary approach documented in their FMPs, and stock status is evaluated against these calculated reference points in the annual stock assessment SAFE reports. Where possible, projections are carried out as part of the stock assessments to determine future trajectories of biomass, and related risks of overfishing. There are no concerns regarding stock enhancement, introduced species, or translocated species for Alaska Pacific cod.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

7.1.1 In implementing the PA, the fishery management organization shall take into account, *inter alia*, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality, the impact of fishing activities (including discards) on non-target and associated or dependent predators, and environmental and socioeconomic conditions.

FAO CCRF (1995) 7.5.2

Evaluation Parameters

Process: *There is a system in place under which the potential uncertainties listed above can be examined and taken into account during the decision-making process.*

Current Status/Appropriateness/Effectiveness: *There is evidence to demonstrate that in the fishery under assessment, uncertainties considered include those associated with the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities (including discards) on non-target and associated or dependent predators, as well as environmental and socio-economic conditions.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in implementing the PA, the fishery management organization takes into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities (including discards) on non-target and associated or dependent species, as well as environmental and socio-economic conditions. Examples may include stock assessment reports, fishery management plans and other documents.*

Evaluation (per parameter)

Process:
Potential uncertainties in the stock size, reference points, productivity, etc. are taken into account in the assessment process. Uncertainties in the management process re reference points, classification of stocks into precautionary approach tiers, setting of catch levels, etc. are explicit in the Council FMPs.

Current Status/Appropriateness/Effectiveness:
Scientists evaluate how fish stocks and user groups might be affected by fishery management actions. The assessments take into account uncertainty in such parameters as survey index data, mean weights at age, and stock-recruit relationship. Analyses evaluate stock status relative to reference points in a probabilistic way, and risks of exceeding reference points at current and projected stock sizes are explicitly presented in the catch option tables in each SAFE report. Extensive research on impacts of fishing, environmental factors, and socioeconomics is presented annually.

The overall objectives of the Council management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty. The management plan classifies each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and F relative to MSY considerations. The HCRs associated with these tiers consider the uncertainty associated with each level of information. ABC is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and the ABC is set below the OFL. TAC is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty. In the Council approach, TAC <= ABC < OFL.

Evidence Basis:
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 Council's FMPs for groundfish in GOA and BSAI regions are explicit in how different levels of uncertainty are accounted for in the management process. Environmental data and socioeconomic data are also well documented through annual SAFE reports, as outlined in previous clauses.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.5.1, 12.3
FAO Eco (2009) 29.6, 32

Evaluation Parameters

Process: *There is a process that identifies weaknesses in the scientific information available to fishery management organizations and initiates additional research as necessary. The primary focus of this requirement is the status of the stocks under consideration.*

Current Status/Appropriateness/Effectiveness: *There is evidence that such a process has been applied in the case of the fishery under assessment, including examples of initiated research. Depending on the situation, appropriate research or further analysis of the identified risk is initiated in a timely fashion.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the absence of adequate scientific information, appropriate research is initiated in a timely fashion. Examples may include various data or scientific reports.*

Evaluation (per parameter)

Process:
Stock assessments are reviewed on a number of levels, including externally. Where data gaps have been identified, the NMFS/AFSC and ADFG has ongoing research programs capable of addressing these needs. Organizations, such as NPRB, allow scientists from Pacific cod. Research is also conducted by ADFG on the state-managed Pacific cod fisheries.

Current Status/Appropriateness/Effectiveness:
The scientific information available for the Pacific cod resources is of a very high standard and include long time series of catch and fishery data, as well as multiple sources of fishery independent data. The annual NMFS/Council stock assessments are of excellent quality, and are subjected to levels of peer review, including committees in NPFMC. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by the CIE. These reviews are intended to lay a broader groundwork for improving the stock assessments outside the annual assessment cycle. The EBS and AI Pacific cod assessment was reviewed by three external reviewers from the CIE in 2016 and 2021, and several recommendations from this review were incorporated into the following assessments. Similarly, the GOA Pacific cod assessment was reviewed by CIE in 2021, along with the BSAI Pacific cod stocks. Subsequent assessments addressed many of the recommendations contained in that review.

Evidence Basis:

The CIE reviews are available on the NMFS website and are discussed further in Clause 5.1 above. The SAFE documents on Pacific cod assessment have detailed descriptions on how the CIE recommendations are dealt with in the assessment process.

The GOA Pacific cod assessment was reviewed by three external reviewers from the CIE in 2018 their reports are available on the NMFS website (see https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2018). The EBS Pacific cod assessment was reviewed by three external reviewers from the CIE in 2016 and 2021 and their reports are available on the NMFS website (see https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2016 and https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2021). Recommendations from these reviews were taken into account in the 2016 EBS Pacific cod assessment, where possible.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

7.2 In the case of new or exploratory fisheries, the fishery management organization 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. Management measures should, if appropriate, allow for the gradual development of the fisheries.

FAO CCRF (1995) 7.5.4

Evaluation Parameters

Note: *This clause is only applicable for new or exploratory fisheries.*

Process: *For new or exploratory fisheries, there is a process that allows immediate application of the PA, including catch and effort limits, and the possible adverse impact of such fisheries on the long-term sustainability of the stocks.*

Current Status/Appropriateness/Effectiveness: *There is evidence that catch and effort limits have been implemented, and other management measures, including the assessment of possible adverse impacts, have been performed for these fisheries.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the case of new or exploratory fisheries, the fishery management organization adopts, as soon as possible, cautious conservation and management measures, including, inter alia, catch and effort limits. Such measures 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 are implemented. Management measures should, if appropriate, allow for the gradual development of the fisheries. Examples may include various data or scientific reports.*

Evaluation (per parameter)

This clause is not applicable as fisheries for Pacific cod in Alaska are well established.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

C. Management Measures, Implementation, Monitoring, and Control

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 based upon verifiable evidence and advice from available objective scientific and traditional sources.

FAO CCRF (1995) 7.1.1, 7.1.2, 7.1.6, 7.4.1, 7.6.1, 7.6.9, 12.3
FAO Eco (2009) 29.2, 29.4, 30
FAO Eco (2011) 36.2, 36.3

8.1 Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote optimum utilization and are based on verifiable and objective scientific and/or traditional, fisher, or community sources.

FAO CCRF (1995) 7.1.1; Others 7.4.1, 7.6.7
FAO Eco (2009) 29.2, 29.4
FAO Eco (2011)36.2

Evaluation Parameters

Process: *The process by which management measures are developed for the fishery utilizes the best scientific evidence available, including traditional sources where these are verifiable, and also considers the cost-effectiveness and social impact of potential new measures. The assessment team shall provide evidence for the main type of management measures present in the fishery. Some of the main examples may include (but are not limited to) legal gear specifications, permit requirements, observer requirements, reporting requirements, limited access, vessel license limitations, size limits, sex restrictions, total allowable catch, in season adjustments, fishing seasons, geographical registrations areas, bycatch reduction devices, gear modification, minimizing waste and ghost fishing, closed waters, catch limits for other fisheries, and bycatch management.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the overall framework of management measures in place is effective at achieving the long-term optimum yield, which is defined by the FAO as "the harvest levels for a species that achieves the greatest overall benefits, including economic, social and biological considerations." If the stock has been maintained above the limit reference point, this shall be taken as evidence that management measures are effective in avoiding overfishing.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that conservation and management measures are designed to ensure the long-term sustainability of fishery resources at levels which promote optimum utilization and are based on verifiable and objective scientific and/or traditional, fisher, or community sources. Examples may include reports, fishery management plans, regulations, or other management measures.*

Evaluation (per parameter)

Process:
Conservation and management measures in place ensure the long-term sustainability of the resources. FMPs which are based on the MSA have objectives to prevent overfishing and promote sustainable and equitable use of the Pacific cod resource. The Council has established a science-based precautionary approach and HCR and based on the scientific assessment of the stock, uses this approach to determine appropriate harvest levels. The process utilizes the best available scientific evidence and considers the cost-effectiveness and social impact of any potential new measures.

Current Status/Appropriateness/Effectiveness:
National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and 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 (e.g., the OY limits). The objectives are spelled out clearly in modern FMPs for BSAI and GOA Regions, and both FMPs contain long-term management objectives for the Alaska Pacific cod fishery.

The state Pacific cod fisheries are managed by ADFG and the BOF using an annual GHL set as a percentage of the appropriate federal ABC for Pacific cod and regulations are developed and established by the BOF. Extensive cooperation exists between federal and state authorities in assessing and managing the Pacific cod stocks.

Evidence Basis:
The MSA sets out the standards (e.g., optimal use and avoiding overfishing) which are followed in managing the Pacific cod fisheries in Alaska. FMPs for the GOA and BSAI Regions spell out the precautionary approach used by the Council in its management. The 2021 SAFE reports document the latest scientific information and assessment of Pacific cod stocks, including current and projected biomass and F, and their position relative to the reference points. Economic considerations are also contained in a chapter within the SAFE reports.

Guiding principles for the BOF state-managed groundfish fisheries (5 AAC 28.263; see http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm) includes provisions such as "conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock". Further details pertaining to the state Pacific cod fisheries are published on the ADFG website.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Magnusson Stevens Act (MSA) 2007 (as amended) http://www.nmfs.noaa.gov/sfa/laws_policies/msa/documents/msa_amended_2007.pdf

NPFMC 2020a Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.1.1 When evaluating alternative conservation and management measures, the fishery management organization shall consider their cost-effectiveness and social impact.

FAO CCRF (1995) 7.6.7

Evaluation Parameters

Process: *The process by which management measures are developed for the fishery allows for consideration of the cost effectiveness and social impact of potential new or modified management measures.*

Current Status/Appropriateness/Effectiveness: *There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that in the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered. Examples may include reports, fishery management plans, regulations or other management measures.*

Evaluation (per parameter)

Process: The Council FMPs for Alaska groundfish recognize the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield.

Current Status/Appropriateness/Effectiveness: The Council 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. Harvest levels for each groundfish species or species group that are set by the Council for a new fishing year are based on the best biological, ecological, and socioeconomic information available, and follow a rigorous and public peer-reviewed process.

The AFA affected the Alaskan fishing industry through overall capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish, and higher valued products. Amendment 80 went into effect in 2008 and divided groundfish target quotas and bycatch limits among cooperatives such as the Alaska Seafood Cooperative (http://alaskaseafoodcooperative.org). A number of cooperatives and coalitions have formed, such as the Freezer Longline Coalition (https://www.freezerlonglinecoalition.com). Their stated mission is to promote public policy that facilitates the intelligent and orderly harvest of Pacific cod and other groundfish species in the EBS, AI, and GOA to encourage the reduction of waste and improvement of resource utilization in the longline fishery, to encourage the reduction of incidental catch of non-target species in the longline fisheries, to support research and public education about the longline fisheries, and to represent longline fishery interests in matters concerning the management and regulation of the longline fishery with respect to target species and protected resources. The Freezer Longline Coalition is a non-profit corporation that represents the owners and operators of the vessels that participate in the freezer longline, or catcher processor hook-and- line sector of the Pacific cod fishery in the federal waters of the BSAI and GOA regions. The cooperatives that formed (e.g., the Alaska Seafood Cooperative) operate under a catch share program that allocates fixed amounts of Pacific cod, and other species in GOA and BSAI to the Cooperative. In return, the fleet agreed to increase the amount of fish retained to reduce bycatch and to promote sustainable fishing practices. By ending the race for fish and working cooperatively, the fleet now harvest more fish with fewer tows by targeting areas of high abundance.

The Western Alaska CDQ Program (https://alaskafisheries.noaa.gov/fisheries/cdq) 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 CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities and the current allocation is 10% of the Pacific cod TAC. The effects of such measures on communities are regularly reviewed within the Council.

In 2000, the Council adopted the Alaska LLP (https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/license-limitation-program-alaska). The intent of the program has been to use fishing track record to rationalize the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licenses.

Evidence Basis: More information on AFA, CDQ, and LLP was presented in earlier clauses (see Clause 3.2.1 and 3.2.3). NMFS has numerous reports on the performance of the groundfish fleets, including economic analysis sections in the annual SAFE documents noted previously. The cooperatives submit annual reports to the Council. Cooperatives have reported that with no “race for fish”, retention rates have increased, and bycatch rates have fallen.

References:

Cooperative reports to the NPFMC https://www.npfmc.org/cooperative-reporting/
Economic Status Report for the Gulf of Alaska and Bering Sea/Aleutian Islands 2020 (SAFE 2020):
https://www.fisheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-bering-sea-aleutian-islands

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.1.2 Responsible fisheries management organizations shall adopt and implement measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management (1) in accordance with the PA, as reflected in Article 6 of the UN Fish Stocks Agreement, and as set out in Article 6.5 and 7.5 of the Code; (2) in accordance with the responsible use of fish as set out in the Code; and (3) based on the best scientific evidence available, taking into account fishers' knowledge.

FAO IGBD (2011) 3.2.2

Evaluation Parameters

Process: *The responsible fisheries management organizations has adopted and implemented effective measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management.*

Current Status/Appropriateness/Effectiveness: *There is evidence of adoption and implementation of effective measures to ensure the management of bycatch and reduction of discards as part of fisheries management (1) in accordance with the PA, as reflected in Article 6 of the UN Fish Stocks Agreement, and as set out in Article 6.5 and 7.5 of the Code; (2) in accordance with the responsible use of fish as set out in the Code; and (3) based on the best scientific evidence available, taking into account fishers' knowledge. Please note that traditional knowledge should be verifiable. The strategy to ensure the management of bycatch and reduction of discards as part of fisheries management is being implemented successfully (e.g., there is a well-known track record of consistently setting conservative bycatch limits based on quality information and advice about bycatch); or bycatch is minimized to the greatest extent possible, especially for vulnerable species such as sharks, seabirds, turtles, and marine mammals, through mitigation measures that have been shown to be highly effective (e.g., observer coverage and procedures, bycatch caps, utilization measures, full catch accounting, on-deck techniques, avoidance mechanisms and gear technology, etc.). Also, the fishery is not a leading cause of a high level of mortality for any species of concern (e.g., not a Category I fishery for marine mammal bycatch as designated by the National Marine Fisheries Service).*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the responsible fisheries management organizations have adopted and implemented effective measures necessary to ensure the management of bycatch and reduction of discards as part of fisheries management. Examples may include stock assessment, bycatch or other ecosystem assessment reports.*

Evaluation (per parameter)

Process: The setting of retention requirements and prohibited species catches (objectives) through the FMP process provides a mechanism by which the catch, waste and discarding of non-target species is minimized.

Current Status/Appropriateness/Effectiveness: There are a comprehensive set of measures in place to minimize catch, waste, and discards of non-target species, as described above. These, combined with operational measures employed by industry to meet the specific targets, are considered effective at achieving the specified management objectives.

The principal mechanism for directing measures to minimize catch, waste, and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species is the FMP (for the BSAI and for the GOA). The plans specify:

1. Minimum retention requirements - all vessels in the groundfish fisheries are required to retain all catch of pollock, Pacific cod and (in GOA) shallow water flatfish when directed fishing for those species is open
2. When directed fishing for pollock, Pacific cod and (in GOA) shallow water flatfish is prohibited, retention of those species is required up to a maximum retainable amount.
3. No discarding of whole fish of these species is allowed, either prior to or subsequent to that species being brought on board the vessel
4. At-sea discarding of any processed product from pollock, Pacific cod and shallow water flatfish is also prohibited (It is noted that pollock, Pacific cod and shallow water flatfish comprise by far the bulk of catches in groundfish fisheries).
5. All pollock, Pacific cod, and in the GOA shallow water flatfish caught must be either processed at sea or delivered in their entirety to onshore processing plants.
6. In the BSAI, quota allocations are made to sectors with management cooperatives operating in virtually all of these. Together with in-season management of quotas and prohibited species catches, this allows for effective uptake of quotas.
7. Long-term seabird and marine mammal monitoring programs in the BSAI and GOA and USFWS, NMFS and industry cooperation in developing strategies and technologies to reduce incidental take in groundfish fisheries.

In addition, specific allocations are made to each sector of the groundfish fishery for catches of Prohibited Species. This relates to halibut, salmon, red king crab, tanner crab, and herring in the BSAI.

Various measures to reduce by-catches of PSC species (crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted in recent years. 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.

Fishing strategies (e.g., day versus night fishing, offal discharge protocols, streamers associated with longline and third wires) have been developed and used to mitigate seabird interactions.

Evidence Basis: Evidence includes FMPs, in-season catch reporting, endangered species conservation plans, and seabird bycatch research. These are all publicly available through NMFS and NPFMC websites.

References:

Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. 10.25923/a0fb-nt02.

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

NOAA 2022c Bycatch and prohibited species catch in groundfish fisheries in Alaska https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska

Amendment 49 Improved Retention/Improved Utilization (IRIU) Program https://www.fisheries.noaa.gov/action/amendment-49-fmp-groundfish-bering-sea-and-aleutian-islands-management-area

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.2 The fishery management organization shall prohibit dynamiting, poisoning, and other similar destructive fishing practices.

FAO CCRF (1995) 8.4.2

Evaluation Parameters

Process: *There are management measures, or regulations, or laws that prohibit destructive fishing practices.*

Current Status/Appropriateness/Effectiveness: *The regulations or laws effectively prohibit dynamiting, poisoning, and other similar destructive fishing practices.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization prohibits dynamiting, poisoning, and other similar destructive fishing practices. Examples may include laws, fishery management plans, regulations, and enforcement data.*

Evaluation (per parameter)

Process:
Management regulations prohibit destructive fishing practices.

Current Status/Appropriateness/Effectiveness:
The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices, as there is no evidence that these practices are being used.

Evidence Basis:
As listed in the Council FMPs and NMFS regulations, the only legal gears for taking Pacific cod in the Alaska fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such gears are being used illegally.

References:

NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

Alaska Fisheries Regulations https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.3 The fishery management organization shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation, and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements shall be made to consult all the interested parties and gain their collaboration in achieving responsible fisheries.

FAO CCRF (1995) 7.1.2, 7.1.6, 7.6.6

Evaluation Parameters

Process: *There is a process that allows for identifying and consulting with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of the fisheries resource.*

Current Status/Appropriateness/Effectiveness: *In accordance with national laws and regulations, there is evidence that domestic parties having a legitimate interest in the use and management of the fishery (as described above) have been identified and encouraged to collaborate in the fisheries management process.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization seeks to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation, and management of the resource, due recognition is given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs, and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements are made to consult all the interested parties and gain their collaboration in achieving responsible fisheries. Examples may include laws, fishery management plans, regulations, and meeting records.*

Evaluation (per parameter)

Process:
The Council and BOF have processes in place to allow for identifying and consulting with domestic parties having interest in the Alaska Pacific cod fisheries.

Current Status/Appropriateness/Effectiveness:
The Council is responsible for allocation of the Pacific cod resource among user groups in Alaska waters. In addition, the Alaska BOF public meeting process provides a regularly scheduled public fora for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaska indigenous 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 Pacific cod license holders, processors, fishermen's organizations, the states of Alaska, Washington, and Oregon, CDQ groups, and environmental groups. Roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. The Council process is the primary means for soliciting stakeholder information important to the Alaska Pacific cod fisheries, and this is fully transparent and open to the public. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. Fishing industry stakeholders work extensively with fishery scientists, managers, and other industry members on various initiatives to ensure sustainability of the Pacific cod fisheries

The Council established a CEC in June 2018 to identify and recommend strategies for the Council to provide effective community engagement with rural and Alaska Native communities. The AFSC have recently produced a report – the Annual Community Engagement and Participation Overview, which will be updated annually and provides social and economic information at the community level for those fishing communities which as substantially dependent on, or engaged in, the North Pacific groundfish and crab fisheries.

The western Alaska 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 CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the BSAI Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. There are approximately 65 communities within a fifty-mile radius of the BS coastline who participate in the program.

Advisory Committees are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the advisory committee meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 84 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BOF meetings.

Evidence Basis:
Details on the Council CEC, the CDQ program, and the enabling statute for the ADFG advisory committees (https://www.adfg.alaska.gov/index.cfm?adfg=process.advisory) and information on BOF and ADFG advisory process can be found in the reference section below.

References:

Alaska Statutes, Title 16, Chapter 5, Section 261. (AS 16.05.260. Advisory Committees). http://www.touchngo.com/lglcntr/akstats/statutes/title16/chapter05/section260.htm.

NOAA. 2021. Annual Community Engagement and Participation Overview (ACEPO) https://meetings.npfmc.org/CommentReview/DownloadFile?p=b26ba0fd-2447-41b2-8de5-6a1a4c488471.pdf&fileName=D8%20ACEPO%20ESSR.pdf.

NPFMC. 2018c. Community Engagement Committee, Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/CEC/CEC_TOR_1218.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.4 Where excess capacity exists, mechanisms shall be established to reduce capacity to levels commensurate with sustainable use of the resource. Fleet capacity operating in the fishery shall be measured and monitored. The fishery management organization shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

FAO CCRF (1995) 7.1.8, 7.6.3, 8.1.2, 8.1.3

Evaluation Parameters

Process: *There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. Research has been conducted to determine or estimate the fishing capacity commensurate with the sustainable use of the resource. There are mechanisms in place to measure the total fishing capacity within the unit of certification, and to reduce this capacity if it is determined to exceed the sustainable level.*

Current Status/Appropriateness/Effectiveness: *There is evidence of the size of fleet capacity, and of data describing fishing operation, and that the mechanisms described above are successful at maintaining the effective fishing capacity of the unit of certification at a level commensurate with the sustainable use of the resource. Management mechanisms, which restrict the application of fishing capacity, such as quotas, shall be considered valid mechanisms in relation to this parameter. The core emphasis of this requirement is to ensure that exploitation is sustainable. Assessment teams should ensure that fisheries are within catch limit recommendations to determine whether excess capacity is having an effect on resource overexploitation.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fleet capacity operating in the fishery is monitored and measured, and statistical data on all fishing operations allowed is updated and maintained. Where excess capacity exists, mechanisms are established to reduce capacity to levels commensurate with sustainable use of the resource. Examples may include fleet reports or other documents or reports.*

Evaluation (per parameter)

Process:
There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. There are mechanisms in place to measure the total fishing capacity, and to reduce it if it is determined to exceed the sustainable level. There are substantial effort controls and records of all fishing operations in the Alaska fisheries through mechanisms, such as the Council LLP (https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/license-limitation-program-alaska) and the Restricted Access Management Program (https://www.fisheries.noaa.gov/contact/alaska-restricted-access-management-program) administered by NMFS Alaska Regional Office.

Current Status/Appropriateness/Effectiveness:

The Council, NMFS, and ADFG have determined the fishing capacity commensurate with the sustainable use of the Pacific cod resource. Management mechanisms such as TACs and quota allocations, along with license limitation and restricted access management, regulate the catch and amount of fishing effort applied to the stocks, and there is an overall OY cap in both GOA and BSAI regions which restricts the total amount of fish of all species that can be removed from these ecosystems. Fleet capacity and regularly updated data on all 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.

Evidence Basis:
The SAFE reports (assessments and economic reports), the cooperative reports (https://www.npfmc.org/cooperative-reporting/), and the Council groundfish FMPs for GOA and BSAI are all documented in several previous clauses and provide the necessary evidence.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.4.3

Evaluation Parameters

Process: *There is a need and a process that allows, as appropriate, for studies to understand the costs, benefits, and effects of alternative management options designed to rationalize fishing.*

Current Status/Appropriateness/Effectiveness: *There is evidence for studies conducted on alternative management options designed to rationalize fishing.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that studies are promoted that provide an understanding of the costs, benefits, and effects of alternative management options designed to rationalize fishing, especially options relating to excess fishing capacity and excessive levels of fishing effort. Examples may include various evaluation or reports on fishing rationalization.*

Evaluation (per parameter)

Process:
Mechanisms have been established to reduce capacity to levels commensurate with sustainable use of the Pacific cod resource in Alaska. These include HCRs on the catch and effort management side, a license limitation program, and reduction of the number of vessels through industry-based initiatives.

Current Status/Appropriateness/Effectiveness:
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. Amendment 80 was approved by the Council in June of 2006 and enabled the formation of fishery cooperatives for trawl C/Ps that are not eligible under the AFA to participate in directed Pacific cod fisheries. In addition to allowing a cooperative for the Amendment 80 CPs, the Amendment 80 also resulted in a separate Trawl Limited Access fishery for yellowfin sole, Pacific cod, and Atka mackerel in BSAI. Amendment 80 affected the groundfish industry in the BSAI Region through capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish and higher valued products. Industry cooperatives have been formed to help accomplish these objectives.

Evidence Basis:
The Council, NMFS, and ADFG have determined the fishing capacity commensurate with the sustainable use of the Pacific cod resource. Management mechanisms such as TACs and quota allocations, along with license limitation and restricted access management, regulate the catch and amount of fishing effort applied to the stocks, and there is an overall OY cap in both GOA and BSAI regions which restricts the total amount of fish of all species that can be removed from these ecosystems. Fleet capacity and regularly updated data on all 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 SAFE reports (assessments and economic reports), the cooperative reports, and the Council groundfish FMPs for GOA and BSAI are all documented in several previous clauses and provide the necessary evidence.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.5 Technical measures regarding the *stock under consideration* shall be taken into account, where appropriate, in relation to fish size, mesh size, gear, closed seasons or areas, areas reserved for particular (e.g., artisanal fisheries), and protection of juveniles or spawners.

Evaluation Parameters

Process: *The management system has taken into account technical measures, where and as appropriate (i.e., some fisheries do not have the requirement for a minimum fish size), to the fishery and stock under assessment, in relation to fish size, mesh size, gear, closed seasons, closed areas, areas reserved for particular (e.g., artisanal) fisheries, and protection of juveniles or spawners.*

Current Status/Appropriateness/Effectiveness: *Technical measures are related to sustainability objectives, ensuring sustainable exploitation of the target species, and minimizing the potential negative impacts of fishery activities on non-target species, ETP species, and the physical environment.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that technical measures regarding the stock under consideration are taken into account, where appropriate, in relation to fish size, mesh size, gear, closed seasons, closed areas, areas reserved for particular (e.g., artisanal) fisheries, and protection of juveniles or spawners. Examples may include fishery management plans, regulations, or various other reports.*

Evaluation (per parameter)

Process:
The management system has taken into account various technical measures, where and as appropriate to the fishery and stock under assessment, in relation to fish size, fishing gear, closed seasons, closed areas, areas reserved for particular (e.g., artisanal) fisheries, and protection of juveniles or spawners.

Current Status/Appropriateness/Effectiveness:
There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the Alaska 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 ETP species (including salmon, crab, and marine mammals). Since 2000, 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.

Evidence Basis:

A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs (e.g., see Table ES- 2 in the GOA FMP). The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website. These regulations 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 Council FMPs for GOA and BSAI. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaskan waters also exist, and data on seabirds are collected by observers, and included in the SAFE documents.

Various measures to reduce by-catches of PSC species (crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted in recent years. 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.

Data from the Observer Program enables enforcement of bycatch quotas for the species that by regulation have to be discarded at sea. Regarding the endangered Steller sea lions, the Council has acted in a precautionary manner to place protection around rookeries and haulouts and close areas where fishing may impact Steller sea lion prey such as Pacific cod. ADFG has also implemented areas in state waters closed to fishing (e.g., around Steller sea lion rookeries).

References:

Alaska Fisheries Regulations. https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska.

Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. https://repository.library.noaa.gov/view/noaa/32076.

NOAA. 2022c. Bycatch and prohibited species catch in groundfish fisheries in Alaska. https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska.

NOAA. 2022d. Regulations on seabird avoidance. https://www.fisheries.noaa.gov/alaska/bycatch/alaska-regulations-seabird-avoidance-and-listed-seabirds.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

NPFMC 2022d Groundfish bycatch management https://www.npfmc.org/fisheries-issues/bycatch/groundfish-bycatch/

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.5.1 Appropriate measures shall be applied to minimize catch, waste, and discards of non-target species (both fish and non-fish species), and impacts on associated, dependent, or endangered species.

FAO CCRF (1995) 7.6.9
FAO Eco (2009) 31.1

Evaluation Parameters

Process: *There is a mechanism by which management measures are developed to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent, and ETP species. This system shall include the development of specific management objectives.*

Current Status/Appropriateness/Effectiveness: *There are measures in place to minimize catch, waste, and discards of nontarget species (both fish and non-fish species). These measures are considered effective at achieving the specific management objectives described in the process parameter. There are measures in place to minimize impacts on associated, dependent, or endangered species. These measures are considered effective at achieving the specific management objectives described in the process parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that appropriate measures are applied to minimize catch, waste and discards of non-target species (both fish and non-fish species), and impacts on associated, dependent, or endangered species. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
The principal mechanism for directing measures to minimize catch, waste, and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species is the FMP (for the BSAI and for the GOA). The plans specify:

1. Minimum retention requirements - all vessels in the groundfish fisheries are required to retain all catch of pollock, Pacific cod and (in GOA) shallow water flatfish when directed fishing for those species is open.
2. When directed fishing for pollock, Pacific cod and (in GOA) shallow water flatfish is prohibited, retention of those species is required up to a maximum retainable amount.
3. No discarding of whole fish of these species is allowed, either prior to or subsequent to that species being brought on board the vessel.
4. At-sea discarding of any processed product from pollock, Pacific cod and shallow water flatfish is also prohibited (It is noted that pollock, cod and shallow water flatfish comprise by far the bulk of catches in groundfish fisheries).
5. All pollock, Pacific cod, and in the GOA shallow water flatfish caught must be either processed at sea or delivered in their entirety to onshore processing plants.
6. In the BSAI, quota allocations are made to sectors with management cooperatives operating in virtually all of these. Together with in-season management of quotas and prohibited species catches, this allows for effective uptake of quotas.
7. Long-term seabird and marine mammal monitoring programs in the BSAI and GOA and USFWS, NMFS, and industry cooperation in developing strategies and technologies to reduce incidental take in groundfish fisheries.

In addition, specific allocations are made to each sector of the groundfish fishery for catches of prohibited species. This relates to halibut, salmon (principally Chinook) and also red king crab, tanner crab, and herring in the BSAI.

The setting of retention requirements and prohibited species catches (objectives) through the FMP process provides a mechanism by the catch, waste and discarding of non-target species is minimized. The extent and efficacy of these measures will concomitantly limit any impact of the fishery on associated, dependent and ETP species.

Fishing strategies (e.g., day versus night fishing, offal discharge protocols, streamers associated with longline and third wires) have been developed and used to mitigate seabird interactions.

In 2021, Governor Dunleavy, created the Alaska Bycatch Review Task Force to help better understand unintended bycatch of high value fishery resources in State and federal waters. The ongoing work of the Task Force includes studying the impacts of bycatch on fisheries, evaluation and recommendation on policies.

Current Status/Appropriateness/Effectiveness:

There are a comprehensive set of measures in place to minimize catch, waste, and discards of non-target species, as described above. These, combined with operational measures employed by industry to meet the specific targets, are considered effective at achieving the specified management objectives. As described elsewhere, specific measures are in place to minimize impacts on associated, dependent, or endangered species; notably the prohibited species requirements, while measures are in place to deter seabirds from gear, to avoid critical habitat of endangered species and to maintain ecosystem function through monitoring of a range of indicators of the state of the ecosystem which are specifically considered by the plan teams and the Council.

Evidence Basis:
There is extensive evidence including FMPs, in-season catch reporting, endangered species conservation plans, and seabird monitoring and research. These are all publicly available through NMFS and Council websites.

References:

ADFG. 2022h. Alaska Bycatch Review Task Force (ABRT) Overview. https://www.adfg.alaska.gov/index.cfm?adfg=bycatchtaskforce.main.
ADFG. 2022i. Bycatch Overview in State Managed fisheries presentation. https://www.adfg.alaska.gov/static/fishing/PDFs/bycatchtaskforce/bycatch_overview_state_fisheries.pdf.
Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. https://repository.library.noaa.gov/view/noaa/32076.
NOAA. 2022c. Bycatch and prohibited species catch in groundfish fisheries in Alaska. https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
Steller sea lion: Conservation and Management. https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.6 Fishing gear shall be marked in accordance with the State's legislation in order that the owner of the gear can be identified. Gear marking requirements shall take into account uniform and internationally recognizable gear marking systems.

FAO CCRF (1995) 8.2.4

Evaluation Parameters

Process: *There is regulation for gear marking.*

Current Status/Appropriateness/Effectiveness: *Fixed gear is marked according to national legislation, and lost fixed gear can be identified back to owner.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing gear is marked in accordance with State's legislation in order that the owner of the gear can be identified. Gear marking requirements take into account uniform and internationally recognizable gear marking systems. Examples may include various fleet reports and regulations.*

Evaluation (per parameter)

Process:
There are NMFS regulations for gear marking in the Alaska fisheries in GOA and BSAI.

Current Status/Appropriateness/Effectiveness:
Fixed gear is marked according to regulations, which state:
(1) All hook-and-line, longline pot, and pot-and line marker buoys carried on board or used by any vessel regulated under this part shall be marked with the vessel's Federal fisheries permit number or ADFG vessel registration number.
(2) Markings shall be in characters at least 4 inches (10.16 cm) in height and 0.5 inch (1.27 cm) in width in a contrasting color visible above the water line and shall be maintained so the markings are clearly visible.

Evidence Basis:
Regulations pertaining to vessel and gear markings in the Pacific cod fisheries are established in NMFS and ADFG regulations (e.g., as prescribed in the annual management measures published in the Federal Register). There was no evidence raised/available that indicated the marking of gear is not being followed or is not effective.

References:

Alaska Fisheries Regulations. https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska.
ADFG. 2022c. Commercial Fisheries Regulations. https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.7 The fishery management organization 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 are sufficiently selective as to minimize catch, waste, discards of non-target species (both fish and non-fish species) and impacts on associated or dependent predators. The use of fishing gear and practices that lead to discarding the catch shall be discouraged, and the use of fishing gear and practices that increase survival rates of escaping fish shall be promoted. Inconsistent methods, practices, and gears shall be phased out accordingly.

FAO CCRF (1995) 7.2.2, 7.6.4, 7.6.9, 8.4.5, 8.5.2

Evaluation Parameters

Process: *The management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to reduce waste and discard of the target species. Relevant groups include fishers, processers, distributers, and marketers. There are mechanisms in place by which the selectivity, environmental impact, and cost-effectiveness of gears included in the unit of certification are measured.*

Current Status/Appropriateness/Effectiveness: *Such technologies and operational methods have been implemented. The methods in use are effective in reducing waste and discards of the non-target species. There is evidence that the gears used in the fishery are appropriate, in terms of selectivity, environmental impact, and cost-effectiveness, as assessed by the responsible scientific authority of the fishery. Methods shall be considered successful if there is evidence that the fishery under assessment is not causing significant risk of overfishing to non-target species.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization and relevant groups from the fishing industry measure performance and encourage the development, implementation, and use of selective, environmentally safe, and cost effective gear, technologies and techniques, that are sufficiently selective as to minimize catch, waste, discards of non-target species (both fish and non-fish species), and impacts on associated or dependent species. Examples may include various reports, regulations, or other data.*

Evaluation (per parameter)

Process:
The Council/NMFS/ADFG management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to improve gear selectivity, and to reduce waste and discard of the target species, such as the Improved Retention/Improved Utilization Program, and utilization of distinct annual time periods (seasons) to manage the fisheries. The selectivity, environmental impact and cost-effectiveness of fishing gears is measured, analyzed, and monitored in a number of ways, including extensive analysis and reporting of data in the SAFE documents, the EFH work, and at-sea enforcement of regulations.

Current Status/Appropriateness/Effectiveness:
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 ETP 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.

Long-term seabird and marine mammal monitoring programs in the BSAI and GOA and USFWS, NMFS, and industry cooperation in developing strategies and technologies to reduce incidental take in groundfish fisheries are in place. Fishing strategies (e.g., day versus night fishing, offal discharge protocols, streamers associated with longline and third wires) have been developed and used to mitigate seabird interactions.

Evidence Basis:
A summary of the Council management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs (e.g., see Table ES- 2 in the GOA FMP). The full suite of NMFS fishery regulations for Alaska waters can be found on the NMFS website. These regulations 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, several closure zones for trawl gears are described in the Council FMPs for GOA and BSAI. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaskan waters also exist, and data on seabirds are collected by observers, and included in the SAFE documents.

Various measures to reduce by-catches of PSC species (crabs, halibut, Chinook) in BSAI and GOA, including gear modifications and closed areas and seasons, have been adopted in recent years. 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.

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. A 5% MRA means the maximum amount of skates retained on board the vessel must not exceed 5% of the round weight of other groundfish and halibut retained onboard a vessel. Information in the SAFE reports show that the skate resources in BSAI and GOA are not overfished and/or no overfishing is occurring.

Data from the Observer Program enables enforcement of bycatch quotas for the species that by regulation have to be discarded at sea. The Council has acted in a precautionary manner to place protection around Stellar sea lion rookeries and haulouts and close areas where fishing may impact Steller sea lion prey such as Pacific cod. ADFG has also implemented closed areas in state waters around Steller sea lion rookeries.

Fishing strategies (e.g., day versus night fishing, offal discharge protocols, streamers associated with longline and third wires) have been developed and used to mitigate seabird interactions.

References:

NOAA. 2022c. Bycatch and prohibited species catch in groundfish fisheries in Alaska. https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska.
NOAA. 2022d. Regulations on seabird avoidance. https://www.fisheries.noaa.gov/alaska/bycatch/alaska-regulations-seabird-avoidance-and-listed-seabirds.
NOAA. 2022e. Maximum Retainable Amount (MRA) in Alaska Fisheries. https://www.fisheries.noaa.gov/action/maximum-retainable-amount-mra-alaska-fisheries-federal-register-rules-and-notices.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC 2022d Groundfish bycatch management https://www.npfmc.org/fisheries-issues/bycatch/groundfish-bycatch/

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.8 Technologies, materials, and operational methods or measures—including, to the extent practicable, the development and use of selective, environmentally safe, and cost-effective fishing gear and techniques—shall be applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution, and waste.

FAO CCRF (1995) 7.2.2, 8.4.6, 8.4.1

Evaluation Parameters

Process: *There has been development of technologies, materials, and operational methods that minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, and a system to minimize pollution and waste.*

Current Status/Appropriateness/Effectiveness: *Technologies, materials, and operational methods that minimize the loss of fishing gear and ghost fishing by lost or abandoned gear are applied whenever appropriate. Also, these measures are effective in minimizing, to the extent practicable, pollution and waste.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that 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—are applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution, and waste. Examples may include various regulations, data, and reports.*

Evaluation (per parameter)

Process:
Operational methods and gears regulated in the Alaska Pacific cod fisheries minimize the loss of fishing gear, and the ghost fishing effects of lost or abandoned fishing gear are minimal.

Current Status/Appropriateness/Effectiveness:
No fixed gears such as gillnets are permitted, by regulation, in the federal and state Pacific cod fisheries in Alaska. Thus, there is no ghost fishing from these forms of fishing gear in the Pacific cod fisheries. As well, there is minimal ghost fishing from gear loss in trawl fisheries. Cod traps are fitted with biodegradable panels to mitigate their ghost fishing potential if lost.

Evidence Basis:
The Council FMPs outline the allowable fishing gears allowed in the Alaskan Pacific cod fisheries. No gillnetting is permitted for Pacific cod. Evidence provided by fishing fleets indicates that lost fishing gear is minimal. A NOAA study shows mortality ghost fishing and gear loss for derelict trawl and longline are likely lower in comparison to gillnets and trap gears. Although less is known on the effects of the trawl and longline gears. 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. The previous clause contains information on several measures aimed at reducing bycatch/waste and improving the selectivity of fisheries for Pacific cod. 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. There are no formal estimates of lost pot gear in the Pacific cod fishery; however, various initiatives have been undertaken to recover lost/derelict fishing gear in some locations (e.g., https://blog.marinedebris.noaa.gov/derelict-fishing-gear-research-and-recovery-fishing-energy).

References:

ADFG. 2022c. Commercial Groundfish Fisheries Regulations. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf.
Alaska Fisheries Regulations. https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska.
NOAA. 2015. Impact of “ghost fishing” via derelict gear https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 8.5.1

Evaluation Parameters

Process: *There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulations.*

Current Status/Appropriateness/Effectiveness: *The adopted methods are successful and effective and fishing regulations are made known to the participants. Enforcement data are highlighting significant violations.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the intent of fishing selectivity and fishing impacts-related regulations is not circumvented by technical devices. Information on new developments and requirements is made available to all fishers. Examples may include various data and reports.*

Evaluation (per parameter)

Process:
Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of the Council, NOAA/NMFS, and ADFG, and through various meetings, mailouts, etc. Fishing gear is regulated and monitored through these agencies, and data on compliance is recorded and published.

Current Status/Appropriateness/Effectiveness:
Advancements or developments in fishing gear are made widely available to fishers through websites and public meetings and other forms of communication. Use of excluder devices is generally thought not to negatively impact the selectivity of the trawls toward Pacific cod and are designed not to impede escaping fish.

Evidence Basis:
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. Advancements or developments in gear are made widely available to fishers through websites and public meetings and other forms of communication.

References:

ADFG. 2022c. Commercial Groundfish Fisheries Regulations. https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf.
Alaska Fisheries Regulations. https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.10 Assessment and scientific evaluation shall be carried out on the impacts of habitat disturbance on the fisheries and ecosystems prior to the commercial-scale introduction of new fishing gear, methods, and operations. Accordingly, the impacts of such introductions shall be monitored.

FAO CCRF (1995) 8.4.7, 12.11

Evaluation Parameters

Note: *This clause is not applicable if new gear has not been introduced in the past 3 years.*

Process: *New gear has been recently introduced on a commercial scale within the last 3 years, or there is a plan to introduce new gear in the foreseeable future.*

Current Status/Appropriateness/Effectiveness: *An appropriate assessment of potential impacts has been carried out. There is evidence to suggest that the assessment is adequate to support habitat conservation and fishery management purposes. Additionally, there is a monitoring regime in place.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that assessment and scientific evaluation is carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the commercial-scale introduction of new fishing gear, methods, and operations. Accordingly, the effects of such introductions are monitored. Examples may include various regulations, data, and reports.*

Evaluation (per parameter)

This clause is not applicable as no new fishing gears/methods have been reported on a commercial scale in the last three years.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

8.11 International cooperation shall be encouraged for research programs involving fishing gear selectivity, fishing methods and strategies, dissemination of the results of such research programs, and the transfer of technology.

FAO CCRF (1995) 8.5.4

Evaluation Parameters

Process: *There is a system of international information exchange to allow knowledge to be shared.*

Current Status/Appropriateness/Effectiveness: *There is evidence for international information exchange, such as meeting records or other information.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that international cooperation is encouraged for research programs involving fishing gear selectivity, fishing methods and strategies, dissemination of the results of such research programs, and the transfer of technology. Examples may include various data and reports.*

Evaluation (per parameter)

Process:
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 U.S. occurs as part of the science and management process.

Current Status/Appropriateness/Effectiveness:
The TSC of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in U.S. and Canadian waters off the West Coast. The TSC meets annually, reviews the effectiveness of existing regulations, and allows exchange of information on the status of groundfish stocks of mutual concern and to coordinate wherever possible programs of research, such as surveys, age reading, gear research, etc.

Evidence Basis:
Information on the Canada-U.S. cooperation, including various meeting reports, can be found on the TSC of the Canada-U.S. Groundfish Committee homepage.

References:

The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee. https://www.psmfc.org/tsc-drafts/.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.12 The fishery management organization 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 regarding such fishing gear—as an aid for management decisions and with a view to minimizing non-utilized catches.

FAO CCRF (1995) 8.5.3, 12.10

Evaluation Parameters

Process: *There is collaborative research into fishing gear selectivity, fishing methods, and strategies.*

Current Status/Appropriateness/Effectiveness: *There is evidence of such research, and the results have been applied accordingly in fisheries management.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization and relevant institutions involved in the fishery collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species in relation to such fishing gear—as an aid for management decisions and with a view to minimizing non-utilized catches. Examples may include various data and reports.*

Evaluation (per parameter)

Process:
There is considerable collaborative research into fishing gear selectivity, fishing methods and strategies in the Pacific cod fisheries in Alaska. Organizations involved include various fishing industry groups, NMFS, ADFG, University of Alaska, and NPRB. These include selectivity of target and non-target species.

Current Status/Appropriateness/Effectiveness:
There are numerous measures implemented in Alaska fisheries to minimize non-utilized catches, such use prohibition of discarding (the 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.

Evidence Basis:
Exempted fishing permits for testing of deck sorting have been allowed in order to improve survival rates of released halibut in some trawl fisheries. ADFG has also done research on Pacific cod pots, in studies to see if Tanner crab bycatch could be reduced while

maintaining cod catch rates. Fishing strategies (e.g., day versus night fishing, offal discharge protocols, streamers associated with longline and third wires) have been developed and used to mitigate seabird interactions.

References:

Gauvin, J., Concepicion, B., and Olicver, C. 2019. Final Report on the 2018-2019 Halibut Deck Sorting EFP https://media.fisheries.noaa.gov/dam-migration/efp-halibut2018-01-final-rpt.pdf.

NOAA. 2022c. Bycatch and prohibited species catch in groundfish fisheries in Alaska. https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska.

NOAA. 2022d. Regulations on seabird avoidance. https://www.fisheries.noaa.gov/alaska/bycatch/alaska-regulations-seabird-avoidance-and-listed-seabirds.

NOAA. 2022e. Maximum Retainable Amount (MRA) in Alaska Fisheries. https://www.fisheries.noaa.gov/action/maximum-retainable-amount-mra-alaska-fisheries-federal-register-rules-and-notices.

NPFMC 2022d Groundfish bycatch management https://www.npfmc.org/fisheries-issues/bycatch/groundfish-bycatch/

Watson, L.J., Pengilly, D., Jackson, D.R. 1998. Effects of modifications to cod-fishing pots on catch rates of Pacific cod. ADFG. Regional information report No. 4K98-45. https://www.adfg.alaska.gov/FedAidPDFs/RIR.4K.1998.47.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

8.13 Where appropriate, policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. The fishery management organization shall ensure that, when selecting the materials to be used in the creation of artificial reefs, as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.

FAO CCRF (1995) 8.11.1, 8.11.2

Evaluation Parameters

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

Process: *There is a mechanism in place for identifying potential for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. This mechanism ensures that where artificial structures are deemed appropriate, environmental protection, safety, and navigation are considered in their application.*

Current Status/Appropriateness/Effectiveness: *This mechanism has been applied to the stocks under consideration, resulting in the conclusion to either use artificial structures, or that artificial structures are inappropriate. Care has been taken in the selection of*

materials to use in constructing artificial reefs, the selection of sites for their deployment, and to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that where appropriate, policies are developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. The fishery management organization shall also 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. Examples may include various laws, data, and reports.*

Evaluation (per parameter)

This is not applicable in the Alaska Pacific cod fisheries.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 8.1.7, 8.1.10, 8.2.4, 8.4.5

9.1 States shall advance, through education and training programs, the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.

FAO CCRF (1995) 8.1.7, 8.4.1

Evaluation Parameters

Process: *There are implemented education programs for fishers (e.g., health and safety, fisheries management framework, rule and regulation, etc.).*

Current Status/Appropriateness/Effectiveness: *These programs are effective in training fishers, in line with international standards and guidelines.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States enhance, through education and training programs, the education and skills of fishers and, where appropriate, their professional qualifications. Such programs take into account agreed international standards and guidelines. Examples may include various data, websites.*

Evaluation (per parameter)

Process:
There are several available education programs for fishers.

Current Status/Appropriateness/Effectiveness/Evidence Basis:
There are several available education programs for fishers. The North Pacific Fishing Vessel Owners Association (https://npfvoa.org) provides a large and diverse training program that many of the professional crew members must pass. Training ranges from firefighting on a vessel, damage control, man-overboard, MARPOL, etc., and the Sitka-based Alaska Marine Safety Education Association alone has trained more than 200,000 people in marine safety and survival through a Coast Guard-required class on emergency drills. Captains and some officers on the larger catcher processor vessels require certain levels of navigational certification. The State of Alaska, Department of Labor & Workforce Development includes the Alaska Vocational Training and Education Center (now called Alaska's Vocational Technical Center [https://avtec.edu]). One of Center's main divisions is the Alaska Maritime Training Center, which promotes safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry.

Also, the University of Alaska Sea Grant Marine Advisory Program provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. The Marine Advisory Program also conducts sessions of their Alaska Young Fishermen's Summit and provides training and technical assistance to fishermen and seafood processors in western Alaska. Several training courses and workshops were developed in cooperation with local communities and CDQ groups.

Details of the various courses are available and accessible online (e.g., https://marinershq.com/directory/school/229/) and include firefighting, fishing vessel stability, medical emergencies at sea, safety equipment, and survival procedures.

References:

Alaska Marine Safety Education Association (AMSEA). https://www.nationalfisherman.com/suppliers/alaska-marine-safety-education-assn.
Alaska Young Fishermen's Summit. https://alaskaseagrant.org/events/alaska-young-fishermens-summit/.

Conclusion:

Numerical Scoring:	**Starting score**		**Number of EPs NOT met**		**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐		Medium (score = 4 or 7) ☐		High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

9.2 States, with the assistance of relevant international organizations, shall endeavor to ensure, through education and training, that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.

FAO CCRF (1995) 8.1.10

Evaluation Parameters

Process: *There are relevant measures of the FAO CCFR and other applicable environmental and other standards being exposed to fishers for their training.*

Current Status/Appropriateness/Effectiveness: *These programs are effective in training fishers, in line with international standards, guidelines, and key CCRF principles. The presence of general training programs for fishermen (e.g., health and safety, fisheries management framework, rule and regulation, etc.) shall be evidence that the key principles of the CCRF have been filtered down from management to fishermen. Furthermore, the existence of laws and regulation with which fishermen are compliant demonstrate further compliance to this clause.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States, with the assistance of relevant international organizations, endeavor to ensure, through education and training, that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations. Examples may include various data, websites.*

Evaluation (per parameter)

Process:
All regulations governing the Alaska Pacific cod fisheries are available on the Council and NMFS websites, and the results of any changes are widely discussed and communicated. Staff at the NOAA and ADFG regional offices engage in outreach to fishers and industry personnel, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Current Status/Appropriateness/Effectiveness:
All rules and regulations governing Alaska Pacific cod, including those dealing with responsible fishing methods, are readily available on NMFS, the Council, and ADFG websites. To increase communications and understanding between the regulated users and enforcement personnel, NOAAs Alaska Enforcement Division, OLE, and AWT aim to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, contacts thousands of harvesters and industry personnel at organized events, including trade shows, and respond to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Evidence Basis:
A summary of the Council management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs. These also cover legal definitions such as quota shares, IFQ's, etc. The full suite of NMFS and ADFG fishery regulations for Alaskan waters can be found on their respective websites. These regulations cover all aspect of fishing, including seasons, gear limitations, and numerous area closures.

References:

Alaska Fisheries Regulations. https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska.
ADFG. 2022c. Commercial Fisheries Regulations. https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

9.3 The fishery management organization 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 State's laws.

FAO CCRF (1995) 8.1.8

Evaluation Parameters

Process: *There is a system to collect and maintain fisher records.*

Current Status/Appropriateness/Effectiveness: *These records are considered accurate and effective for management purposes.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization maintains, as appropriate, records of fishers which, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws. Examples may include various data or reports.*

Evaluation (per parameter)

Process:
There is a comprehensive system in place to collect and maintain fishermen records.

Current Status/Appropriateness/Effectiveness:

Detailed data on the number and location of Alaska fishers, vessels, permits issued, etc. can be found in the annual SAFE documentation on economics of the fishery. Certain information on Alaskan fisheries has been compiled through the Alaska Fisheries Information Network, although selected studies may not be publicly available as some information is confidential. Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission website. Fishermen in the state-managed fisheries must register prior to fishing and are required to keep a logbook during the fishery. Completed logbook pages must be attached to the ADFG copy of the fish ticket at the time of delivery.

Evidence Basis:
Data on the number and location of Alaska fishers, permits issued, etc. can be found in the Economics chapter of the SAFE reports. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network (https://www.psmfc.org/program/alaska-fisheries-information-network-akfin). Data on fishing in Alaska state-managed fisheries can be found in the State of Alaska's Commercial Fisheries Entry Commission (https://www.cfec.state.ak.us) website. The USCG also maintains records and issues credentials on licenses for crew members, including engineers, captains, mates, deckhands, etc. The State of Alaska issues commercial fishing licenses for all crew.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.1.7, 7.7.3, 7.6.2, 8.1.1, 8.1.4, 8.2.1
FAO Eco (2009) 29.5
FAO Eco (2011) 36.6

10.1 Effective mechanisms shall be established for fisheries monitoring, surveillance, control, and enforcement measures including, where appropriate, observer programs, inspection schemes, and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher, or community approaches, provided their performance could be objectively verified.

FAO CCRF (1995) 7.1.7; Others 7.7.3, 8.1.1
FAO Eco (2009) 29.5
FAO Eco (2011) 36.6

Evaluation Parameters

Process: *There are clear mechanisms established for fisheries monitoring, surveillance, control, and enforcement.*

Current Status/Appropriateness/Effectiveness: *These mechanisms are effective, and include effective observer programs, inspection schemes, and vessel monitoring systems where appropriate for the type of fishery under assessment. Monitoring, surveillance, control, and enforcement mechanisms can be considered effective if they are sufficiently broad to cover the entirety of the unit of certification, there is evidence that rules and regulations are consistently enforced, and there is no evidence of frequent or widespread violation of fishery regulations. This could include relevant traditional, fisher, or community approaches, provided their performance could be objectively verified. With respect to fisheries on the high seas, the legal obligations of UNCLOS and UNFSA have particular relevance. Evidence of the performance of the legal framework can be derived from assessing conformance with requirements covering compliance and enforcement. Specifically, the assessment team shall document the general level/type of fisheries controls (e.g., number of boarding's, reprimands) and the respective level of fisheries violations (e.g., %) on a yearly basis.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that effective mechanisms are established for fisheries monitoring, surveillance, control, and enforcement measures including, where appropriate, observer programs, inspection schemes, and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. Examples may include rules and regulations, enforcement reports.*

Evaluation (per parameter)

Process:
The USCG, NMFS OLE, and AWT (a Division of the Alaska Department of Public Safety) conduct at-sea and shore-based inspections. At-sea, dockside monitoring, aerial surveillance and satellite vessel monitoring systems are in operation within the fisheries and developmental work is ongoing with respect to additional EM technologies.

COVID-19 impacted the Alaska fishing industry with reduced effort at-sea and shore-side through 2020 and 2021. As a direct result of COVID-19 and the reduced fishing activity, enforcement was also affected, with fewer inspections where the potential for close person to person interaction was deemed likely (e.g., vessel, port, and processing facility inspections). However, with the development and implementation of safe working practices for the fishing and ancillary industries and protocols for inspections, monitoring, control, and surveillance of the Alaska fisheries returned to near normal during 2021.

Current Status/Appropriateness/Effectiveness:
MCS is carried out at-sea and shore-side for the federal fisheries by the OLE and the USCG (17th District USCG). The AWT fulfils the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

OLE protects marine wildlife and habitat by enforcing domestic laws (e.g., Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679]) and international agreements (e.g., IUU fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia).

The OLE in Alaska focuses on outreach and education programs to help the fishing industry understand the rationale for regulations

and prevent or minimize infractions. The NMFS Alaska Region OLE regularly provides reports and updates to the Council and has consistently reported few major compliance issues with the Pacific cod fishery.

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

The USCG is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the U.S. EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th USCG District (https://www.pacificarea.uscg.mil/Our-Organization/District-17/) covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of responsibility within the USCG.

If the USCG detect a fisheries infringement, they gather evidence and hand over the investigation to the OLE. The Pacific cod fishery is considered to be a lower risk fishery, with the potential for halibut bycatch at certain times of the year being the main issue; however, voluntary compliance (i.e., recognizing a problem, reporting it, and making appropriate changes to the fishing practice) helps to minimize the issue. The USCG use a software package (FishTactic) to assess risk of infringements and is used to assist the deployment of vessels and aircraft and target enforcement effort.

The Observer Program is an important component of the monitoring of the Pacific cod fishery. The program is the main data gathering program for all biological and fishery data that feed into Pacific cod stock assessment and management.

While observers are not directly part of the federal MCS program they are required to report infringements. OLE and USCG officers conduct de-briefing interviews with observers, checking on vessels fishing practices and the conduct of the crew. Observers will often report potential infringements to the vessel captains, thereby contributing to self-regulation and corrective action.

The Alaska Department of Public Safety, through its Division of AWT, is primarily responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska. Some ADFG biologists and other staff have undertaken enforcement training and may participate in enforcement activities and assist the AWT as needed. The AWT attend the BOF and have an important input in the development of state regulations and legislation.

Evidence Basis:
The OLE publishes a national annual report, 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 low occurrence of serious offences indicates that the Pacific cod fisheries is generally very compliant with regulations and the sanctions are considered to be an effective deterrent.

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

References:

Federal Regulations for Fisheries of the EEZ of Alaska [50 CFR Part 679]. https://www.law.cornell.edu/cfr/text/50/part-679.
MSA section (50 CFR 600.740) "remedies for violations". https://www.law.cornell.edu/cfr/text/50/600.740.
NOAA. 2022f. Electronic Monitoring in Alaska. https://www.fisheries.noaa.gov/alaska/resources-fishing/electronic-monitoring-alaska.
NOAA 2022g. Alaska Fisheries Impacts from Covid-19 https://media.fisheries.noaa.gov/2021-02/Alaska-COVID-19-Impact-Snapshot-webready.pdf.
NPFMC. 2022a. Enforcement Committee Terms of Reference. https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf.
OLE. 2021c. OLE Enforcement Report to Council. https://meetings.npfmc.org/CommentReview/DownloadFile?p=ca983f30-9a78-405e-9bf8-a4d552853f15.pdf&fileName=B4%20OLE%20Report.pdf.

USCG. 2021. 17th Coast Guard District Enforcement report to NPFMC: October – November 2021. https://meetings.npfmc.org/CommentReview/DownloadFile?p=43d5d53b-a720-4d32-a660-3ecbe06b19db.pdf&fileName=B6%20USGC%20Report.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.6.2; Others 8.1.2, 8.2.1

Evaluation Parameters

Process: *There is a mechanism or system established to maintain a record of fishing authorizations.*

Current Status/Appropriateness/Effectiveness: *This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing vessels are not allowed to operate on the stock under consideration in question without specific authorization. Examples may include various data.*

Evaluation (per parameter)

Process:
Every fishing vessel targeting Pacific cod in Alaska is required to have a federal or state permit. The Restricted Access Management Program is responsible for managing NOAAs Alaska Region license and permit programs. The Restricted Access Management Program's responsibilities include providing program information to the public, determining eligibility and issuing permits, processing transfers, collecting landing fees and related activities.

The Alaska Commercial Fisheries Entry Commission helps to conserve and maintain the economic health of Alaska's commercial fisheries by limiting the number of participating fishers and issues permits and vessel licenses and provides due process hearings and appeals as and when needed.

Current Status/Appropriateness/Effectiveness:
OLE, USCG, and AWT staff have online access to information related to permits and licenses and are therefore able to confirm whether a vessel or individual has the correct credential to be operating in a fishery.

Evidence Basis:
Details of license and permits for the federal and state fisheries are maintained and are accessible online. See references below.

References:

Restricted Access Management Program. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/restricted-access-management-program.
Federal fishing permits and licenses issued in Alaska. https://www.fisheries.noaa.gov/alaska/commercial-fishing/permits-and-licenses-issued-alaska.
State of Alaska's Commercial Fisheries Entry Commission. https://www.cfec.state.ak.us.
Alaska state commercial fishing license and permits. https://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

10.3 States involved in the fishery shall, in accordance with international law, and within the framework of 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 the States jurisdiction.

FAO CCRF (1995) 8.1.4

Evaluation Parameters

Note: *Not applicable if the fishery does not occur outside the State's EEZ.*

Process: *There is a mechanism or system established to conduct enforcement operations outside the State's jurisdiction.*

Current Status/Appropriateness/Effectiveness: *This mechanism is enforcing operations in internationally occurring fisheries. If the stock under consideration is not transboundary, shared, straddling, highly migratory or high seas, then the Standard need only be concerned with the effectiveness and suitability of the monitoring, surveillance, control, and enforcement activities at the States level for the fishery of which the unit of certification is a part. If the unit of certification is part of a States fleet fishing on a transboundary, shared, straddling, highly migratory or high seas stock, then it is still likely to be the effectiveness and suitability of the monitoring, surveillance, control, and enforcement activities at the States level that shall be assessed. If the unit of certification covers all the fishing on the stock under consideration, then the monitoring, surveillance, control, and enforcement of all of the States fleets is of concern and shall be assessed (to ensure full consideration of total fishing mortality on the stock under consideration).*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States involved in the fishery do, in accordance with international law, and within the framework of 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 State's jurisdiction. Examples may include enforcement reports.*

Evaluation (per parameter)

The Alaska Pacific cod fishery does not take place outside of the EEZ so this is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

10.3.1 Fishery management organizations which are members of or participants in 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 engaging in activities that undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, port States shall also proceed, as necessary, to assist other States in achieving the objectives of the FAO CCRF (1995) and should make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State.

FAO CCRF (1995) 7.7.5, 8.3.1

Evaluation Parameters

Note: *Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.*

Process: *There are regulations established against vessels flying the flag of non-member or non-participant States, which may engage in activities that undermine the effectiveness of conservation and management measures established by fisheries management organizations.*

Current Status/Appropriateness/Effectiveness: *These measures are effective in deterring such practices.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organizations which are members of or participants in fisheries management organizations or arrangements 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 engaging in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, port States also proceed, as necessary, to achieve and to assist other States in achieving the objectives of the FAO CCRF and make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State. Examples may include enforcement or other reports.*

Evaluation (per parameter)

The Alaska Pacific cod fishery does not take place outside of the EEZ so this is not applicable.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

10.4 Flag States shall ensure that no fishing vessels are entitled to fly their flag, fish on the high seas or in waters under the jurisdiction of other States, unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish.

FAO CCRF (1995) 8.2.2

Evaluation Parameters

Note: *Not applicable if no foreign vessels fish in the State's EEZ, or if its vessels do not fish in high seas or in another State's EEZ.*

Process: *There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.*

Current Status/Appropriateness/Effectiveness: *These vessels have been issued with a Certificate of Registry, and they are required to carry it on board.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the flag State ensures that no fishing vessels are 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. Examples may include various laws, regulations, and other data or reports.*

Evaluation (per parameter)

The Alaska Pacific cod fishery does not take place outside of the EEZ, and no foreign vessels are allowed to fish in the EEZ.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

10.4.1 Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State shall be marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.

FAO CCRF (1995) 8.2.3

Evaluation Parameters

Note: *Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.*

Process: *There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.*

Current Status/Appropriateness/Effectiveness: *Foreign vessels authorized to fish in the State's EEZ or its vessels fishing in another State's EEZ have been marked accordingly to international guidelines.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State, are marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. Examples may include various laws, regulations, and other data or reports.*

Evaluation (per parameter)

The Alaska Pacific cod fishery does not take place outside of the EEZ, and no foreign vessels are allowed to fish in the EEZ.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

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

FAO CCRF (1995) 7.7.2, 8.2.7

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

Evaluation Parameters

Process: *The system of States laws is of adequate severity to provide for effective sanctions.*

Current Status/Appropriateness/Effectiveness: *There is evidence to substantiate that States laws are of adequate severity to provide for effective sanctions. The evidence here includes largely (a) whether laws set out effective penalty provisions and the courts respond in a manner that deters further or repeat offenses, (b) the views of the industry, other stakeholders, and the general public, and (c) the outcomes and associated trends of the enforcement efforts when measured against appropriate performance indicators.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that States' laws of adequate severity are in place that provide for effective sanctions. Examples may include various laws, regulations, and other data or reports.*

Evaluation (per parameter)

Process/Current Status/Appropriateness/Effectiveness: The MSA provides four options for penalizing violations (50 CFR 600.740 – Enforcement Policy). In ascending order of severity:

1. Issuance of a citation (a type of warning), usually at the scene of the offence (see 15 CFR part 904, subpart E).
2. Assessment by the Administrator of a civil money penalty.
3. For certain violations, judicial forfeiture action against the vessel and its catch.
4. Criminal prosecution of the owner or operator for some offences. It shall be the policy of NMFS to enforce vigorously and equitably the provisions of the MSA by utilizing that form or combination of authorized remedies best suited in a particular case to this end.

OLE agents and officers can assess civil penalties directly to the violator in the form of a summary settlement or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation who can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings.

Alaska state law, universal citation 16.05.723, describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanor conviction within a 10-year period will result in a fine 3 times the value of any fish in possession or a fine of $10,000, whichever is greater. The option of pursuing criminal action is also available to the state. ADFG staff consider that sanctions are effective deterrents (pers. comm Forest Bower, ADFG).

Evidence Basis:
As reported in the 17th Coast Guard District Enforcement report to the Council, the low proportion of violations encountered during at-sea patrols of the Alaska fisheries demonstrates effective deterrence:

	2017	2018	2019	2020	2021
At-sea boardings	775	931	837	546	594
Fisheries violations	10	25	16	14	30
Violation rate*	1%	3%	2%	3%	4%

*Proportion of violations per inspection, including shore-based inspections and safety inspections

References:

Alaska Statute 16.05.723 – Misdemeanor commercial fishing penalties. https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723.
MSA. 2007. 15 CFR PART 904 Subpart E. https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E.
MSA. 2007. 50 CFR 600.740 Enforcement policy. https://www.law.cornell.edu/cfr/text/50/600.740.
USCG. 2021. 17th Coast Guard District Enforcement report to NPFMC: October – November 2021. https://meetings.npfmc.org/CommentReview/DownloadFile?p=43d5d53b-a720-4d32-a660-3ecbe06b19db.pdf&fileName=B6%20USGC%20Report.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

11.2 Sanctions applicable to 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 to affect authorization to fish and/or to serve as masters or officers of a fishing vessel in the event of noncompliance with conservation and management measures.

FAO CCRF (1995) 7.7.2, 8.1.9, 8.2.7

Evaluation Parameters

Process: *The system of sanctions in place is sufficiently severe to deter violations and illegal activities. The system shall be considered adequate in severity if the potential sanctions include fines, suspension or withdrawal of permission to fish, and confiscation of catch or equipment.*

Current Status/Appropriateness/Effectiveness: *There is evidence to substantiate that sanctions for violations of regulations (e.g., suspension, withdrawal, or refusals of fishing permit or of the right to fish) are adequate in severity to secure compliance and discourage violations.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that sanctions applicable in respect of violations and illegal activities are adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions are in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures. Examples may include various laws, regulations, and other data or reports.*

Evaluation (per parameter)

Process:
The NOAA Alaska region has available a “Summary Settlement and Fix-it Schedule” which describes the violation and penalties associated with them. It also includes a sliding scale of penalty for repeat offences (i.e., increasing penalties for first, second, and third violations).

Alaska state law, universal citation 16.05.723, describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanor conviction within a 10-year period will result in a fine three times the value of any fish in possession or a fine of $10,000, whichever is greater. The option of pursuing criminal action is also available to the state.

Current Status/Appropriateness/Effectiveness:
The parameters in Clause 11.1 show that, with the limited violations the sanctions imposed for violations acts a deterrent.

Evidence Basis:

The "Summary Settlement and Fix-it Schedule" and Alaska state law, universal citation 16.05.723 are available online. The Council and BOF provide fora through which enforcement is discussed, reported and where necessary decisions are made for improvement.

References:

Alaska Statute 16.05.723 – Misdemeanor commercial fishing penalties. https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723.
NOAA Alaska region, Summary Settlement and Fix-it Schedule. https://www.gc.noaa.gov/summary-fixit_docs.html.
NOAA Office of General Counsel – Penalty Policy and Schedule. https://www.gc.noaa.gov/enforce-office3.html.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

11.3 Fisheries management organizations shall ensure that sanctions for IUU fishing by vessels and, to the greatest extent possible, nationals under its jurisdiction are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on an administrative penalty scheme. Fisheries management organizations shall ensure the consistent and transparent application of sanctions.

FAO IUU (2001) 21

Evaluation Parameters

Process: *The system of sanctions in place are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on an administrative penalty scheme. The fisheries management organization also ensures the consistent and transparent application of sanctions.*

Current Status/Appropriateness/Effectiveness: *There is evidence to substantiate that sanctions for violations of regulations are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. Sanctions are applied transparently and consistently across the board.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fisheries management organization ensures that sanctions for IUU fishing by vessels and, to the greatest extent possible, nationals under its jurisdiction are of sufficient severity to effectively prevent, deter, and eliminate IUU fishing and to deprive offenders of the benefits accruing from such fishing. This may include the adoption of a civil sanction regime based on an administrative penalty scheme. The fisheries management organization also ensures the consistent and transparent application of sanctions. Examples may include various laws, regulations, and other data or reports.*

Evaluation (per parameter)

Process:
As highlighted in Clause 11.4 above, there is a sanctioning system in place for penalizing fisheries violations. These include IUU fishing. The U.S. has made a concerted effort to combat IUU at a global level and takes action against those countries from which

vessels may operate. If a vessel is detected fishing in U.S. waters under suspicion of IUU the USCG will arrest the vessel and the OLE will undertake the investigation. If found guilty of IUU activities the owners / operators are potentially subject to forfeiture of the vessel, catch and imprisonment in accordance with MSA 2007, 50 CFR 600.740 (Enforcement Policy).

Current Status/Appropriateness/Effectiveness:
IUU activity within the Unit of Certification is extremely rare owing to the effort and resources used, particularly by the USCG and OLE. The USCG 17th Coast Guard District Enforcement report to the Council includes a section on IUU fishing. It has reported on "Operation North Pacific Guard (NPG)", an annual US fisheries law enforcement initiative designed to detect and deter all types of IUU fishing activity in accordance with multilateral and bilateral international agreements to which the United States is party, with the intent of eliminating IUU fishing activity from the North Pacific. The lack of reported incidents of IUU fishing in the U.S. EEZ in recent years serves to demonstrate an effective deterrent.

Evidence Basis:
The MSA (2007) and Maritime Security and Fisheries Enforcement (SAFE) Act provide examples of the legislative framework that is used to combat IUU fishing. The regular reports by the OLE and USCG 17th Coast Guard District enforcement reports to the Council confirm the work undertaken to combat IUU and the lack of reported incidents within the unit of certification provide evidence of deterring the activity.

References:

Maritime (SAFE) Act 2019. https://media.fisheries.noaa.gov/dam-migration/maritime_safe_act-508compliant.pdf.
MSA. 2007. 50 CFR 600.740 Enforcement policy. https://www.law.cornell.edu/cfr/text/50/600.740.
NOAA. 2022h. Report to Congress of the Maritime Security and Fisheries Enforcement Act interagency Working Group on IUU Fishing Regarding Efforts to Investigate, Enforce and Prosecute IUU in 2020. https://media.fisheries.noaa.gov/2021-08/SAFEACTReport_Enforcement.pdf.
NOAA. 2022i. Enforcement Efforts to Combat illegal, Unreported and Unregulated Fishing. https://www.fisheries.noaa.gov/enforcement-efforts-combat-illegal-unreported-and-unregulated-fishing.
OLE. 2021b. Office of Law Enforcement Alaska Enforcement Division December Report to North Pacific Fisheries Management Council. October 2020 to September 2021. https://meetings.npfmc.org/CommentReview/DownloadFile?p=188b9834-6bd4-4281-b950-37581d7f6580.pdf&fileName=B4%202021%20December%20OLE%20Report.pdf.
USCG. 2021. 17th Coast Guard District Enforcement report to NPFMC: October – November 2021. https://meetings.npfmc.org/CommentReview/DownloadFile?p=43d5d53b-a720-4d32-a660-3ecbe06b19db.pdf&fileName=B6%20USGC%20Report.pdf.
USCG. 2022. Illegal, Unreported and Unregulated Fishing. https://www.uscg.mil/iuufishing/.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

11.4 Flag States shall take enforcement measures towards fishing vessels entitled to fly their flag, which have been found by the State to have contravened applicable conservation and management measures. The State shall, where appropriate, make the contravention of such measures an offense under national legislation.

FAO CCRF (1995) 8.2.7

Evaluation Parameters

Note: *Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.*

Process: *If applicable, the system of enforcement measures is effective for foreign vessels fishing in the State's EEZ or for its vessels fishing in high seas or in another State's EEZ.*

Current Status/Appropriateness/Effectiveness: *There is evidence to substantiate enforcement action in these cases (i.e., boarding, violations).*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that flag States take enforcement measures with fishing vessels entitled to fly their flag if the vessels have been found by the State to have contravened applicable conservation and management measures. These enforcement measures will include, where appropriate, making the contravention of such measures an offense under national legislation. Examples may include various laws, regulations, and other data or enforcements reports.*

Evaluation (per parameter)

This clause is not applicable as no foreign vessels fish in the U.S. EEZ.

References:

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (		x 3) =	NA
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☐
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☐
Non-Conformance Number (if applicable):					

D. Serious Impacts of the Fishery on the Ecosystem

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

FAO CCRF (1995) 7.2.3, 8.4.7, 8.4.8, 12.11
FAO Eco (2009) 29.3, 31
FAO Eco (2011) 41-41.4

12.1 The fishery management organization shall assess the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystem, and the relationship among the populations in the ecosystem.

FAO CCRF (1995) 7.2.3

Evaluation Parameters

Process: *There is a process that allows assessment and monitoring of environmental factors (e.g., climatic, oceanographic) on target and associated species in the same ecosystem, and that assess the relationships between species in the ecosystem.*

Current Status/Appropriateness/Effectiveness: *There is evidence that assessments have been conducted to determine the impacts of environmental factors on the target and associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. The results of these studies are in sufficient detail to allow informed management of the fishery. This requirement is intended to provide information about the current understanding of the overall marine ecosystem structure and relationships among the various species, coupled with environmental monitoring. More information about the effects of the fishery on specific ecosystem components (e.g., associated bycatch and ETPs species interactions, gear-habitat disturbance, ecosystem and food-webs impacts, etc.) are assessed in the following clauses of this section.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization assesses the impacts of environmental factors on target and other species belonging to the same ecosystem or associated with or dependent upon the target species, and the relationship among the populations in the ecosystem. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
NOAA, of which NOAA Fisheries is a part, has a series of programs monitoring and modelling oceanographic processes in Alaska and adjoining waters. The data, together with a range of other environmental monitoring information such as plankton, low trophic level fish species, fish populations, and population dynamics of higher predators are all assembled through NOAA Fisheries. The relationship between environmental factors (biotic and abiotic) and BSAI and GOA Pacific cod are evaluated annually in the SAFE process (Barbeaux et al. 2021; Spies et al. 2021, Thompson et al. 2021). All significant and commercial species are assessed individually according to the SAFE Tier system. Most of the species' SAFE reports contain details on ecosystem effects on the species (e.g., prey availability) and fishery effects on the ecosystem. The SAFE evaluations provide a process by which a wide range of relevant environmental information is assembled and evaluated in relation to its potential effects. Ecosystem Status Reports are done annually for EBS, AI, and GOA, updating the climate, biological, and fishing effects in each region (Siddon 2021, Ortiz and Zador 2021, Ferriss and Zador 2021). In addition, the relationship between different populations in the ecosystem is evaluated through ongoing ecosystem and multi-species modelling programs within NMFS. These information sources are presented and considered annually at Council meetings.

Current Status/Appropriateness/Effectiveness:
There is clear evidence that relatively in-depth studies (especially considering the extent of the area under consideration) have been conducted on the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems and on the relationships among these species. Not only are a wide range of parameters monitored, but these are then synthesized into a readily understood form, from systems ecologists to stock assessment scientists and from the SAFE process to managers at the Council. These managers also require information from ecosystem modelling as part of the management process.

The relationships among populations in the ecosystem has been extensively examined through a variety of ecosystem and multi-species models. Food web modelling using Ecopath/Ecosim has been carried out for EBS, AI, and GOA, which provides predominantly guild level analyses of cumulative and ecosystem-level indicators. The CEATTLE model is an example of an "environmentally enhanced" stock assessment model that utilizes abundance, catch and diet data (e.g., catch-at-age data, predator diet information) to estimate F, recruitment, stock size, and predation mortality (https://www.integratedecosystemassessment.noaa.gov/regions/alaska/alaska-eastern-bering-sea-integrated-ecosystem-assessment-modeling).

As noted in Section 3.9, recent conditions have been unusually warm with sea surface temperatures as much as 3° C (about 5.4° F) higher than average. Additionally, in recent years, the annual ice cover in the BS has decreased dramatically, which has likely affected several species' survivability and reproductive success. These changes have been and continue to be investigated. The Council's SSC and the Groundfish Plan Teams are considering these factors on an ongoing basis as they assess the groundfish stocks (e.g., Barbeaux et al. 2021; Spies et al. 2021, Thompson et al. 2021).

Evidence Basis:
There is a significant evidence base including annual stock assessment reports, ecosystem status reports, results of modelling output (the majority of which are published in peer-reviewed scientific journals), and reports of Council meetings, all of which are publicly available through NMFS and Council websites. For example, "national initiatives and AFSC research priorities support conducting an ecosystem and socioeconomic profile (ESP) for Gulf of Alaska (GOA) Pacific cod. Annual guidelines for the AFSC support research that improves our understanding of environmental and climate forcing of ecosystem processes with a focus on variables that can provide direct input into or improve stock assessment and management. The GOA Pacific cod ESP follows the new standardized framework for evaluating ecosystem and socioeconomic considerations for GOA Pacific cod and may be considered a proving ground for potential use in the main stock assessment" (Shotwell et al. 2021).

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.

Shotwell., S.K., S. Barbeaux, B. Ferriss, B. Fissel, B. Laurel, B. Matta, and L. Rogers. 2021. Appendix 2.1. Ecosystem and Socioeconomic Profile of the Pacific cod stock in the Gulf of Alaska. In Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2 The most probable adverse impacts from human activities, including fishery effects on the ecosystem/environment, shall be assessed and, where appropriate, addressed and or/corrected, taking into account available scientific information and local knowledge. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full consideration should be given to the special circumstances and requirements in developing fisheries, including financial and technical assistance, technology transfer, training, and scientific cooperation. In the absence of specific information on the ecosystem impacts of fishing on the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk, the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.

FAO CCRF (1995) 7.2.2
FAO Eco (2009) 29.3, 29.4, 30.4, 31, 31.4
FAO Eco (2011) 41, 41.4

Note: Clause 12.2 is a summary clause and as such does not need to be scored. The 12.2 sub-clauses will instead provide the specific elements that need to be scored.
The most probable adverse impacts from human activities, including fishery effects on the ecosystem/environment shall be assessed and, where appropriate, addressed and or/corrected, taking into account available scientific information and local knowledge. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full consideration should be given to the special circumstances and requirements in developing fisheries, including financial and technical assistance, technology transfer, training, and scientific cooperation. In the absence of specific information on the ecosystem impacts of fishing on 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.

Clause 12.2 is a non-scoring clause so there are no Evaluation Parameters associated with it.

12.2.1 The fishery management organization shall consider the most probable adverse impacts of the unit of certification on main associated species (RFM v2.1 Guidance Appendix 1, Parts 3 and 7[8]), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) shall be monitored and shall not threaten these non-target species 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.

Evaluation Parameters

[8] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on main associated species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such 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. If information has been utilized from generic evidence based on similar fishery situations, then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of nontarget fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear– habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on main associated species (e.g. recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species 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 is taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on main associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these nontarget species 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 is taken. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
The principal mechanism for directing measures to minimize catch, waste, and discards of non-target species (both fish and non-fish species) and impacts on associated species is the FMPs (for the BSAI and GOA). To manage incidental catch and to reduce bycatch and waste, the FMPs specify the following objectives:

1. Continue and improve current incidental catch and bycatch management program.
2. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
3. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
4. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
5. Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.
6. Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target and non-commercial species.
7. Reduce waste to biologically and socially acceptable levels.
8. Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.

The setting of retention requirements the FMP process provides a mechanism by which the catch, waste, and discarding of non-target species is minimized. The extent and efficacy of these measures also limits impact of the fishery on associated species.

Current Status/Appropriateness/Effectiveness:
There is a comprehensive set of measures in place to minimize catch, waste, and discards of non-target species, as described above. Each of the BSAI and GOA Pacific cod fisheries have limited non-target catches with Pacific cod making up around 82% and 80%, respectively (Table 18 and Table 19).

<u>BSAI fishery</u>

For the BSAI fishery, there are a few main associated species with almost all making up less than 2% of the total average catch. The main associated species include:

- Alaska skate – According to Ormseth (2021), the stock is not overfished. Additionally, it makes up 0.57% of total catch and 3.25% of bycatch total so unlikely that the fishery under assessment is negatively impacting the species.
- Other skate – Grouping makes up 9% of the total catch and 51% of the total bycatch; however, this is a complex that is made up of several skate species so no single species is likely to be main associated species. Additionally, the "other skate" complex is not likely to be in an overfished state (Ormseth 2021).
- Pollock – RFM and MSC certified; not overfished
- Rock sole – MSC certified; not overfished
- Yellowfin sole – RFM and MSC certified; not overfished

Therefore, the above details combined with operational measures employed by industry to meet the specific targets are effective at achieving the specified management objectives.

GOA fishery

For the GOA fishery, there are several main associated species with almost all making up less than 2% of the total average catch. The main associated species include:

- Arrowtooth flounder – RFM and MSC certified; not overfished
- Atka mackerel – RFM and MSC certified; not overfished
- Big skate – Does not appear to be overfished (https://www.fishbase.se/summary/2556). Makes up 1.52% of total catch and 7.62% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Dusky rockfish – RFM and MSC certified; not overfished
- Flathead sole – RFM and MSC certified; not overfished
- Giant grenadier – Makes up 0.11% of total catch and 0.55% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Great sculpin – Makes up 0.48% of total catch and 2.42% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Longnose skate – Does not appear to be overfished (https://www.fishbase.se/summary/2566). Makes up 0.94% of total catch and 4.73% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Misc. fish – Grouping makes up 0% of total catch and 0.01% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- North Pacific octopus – Does not appear to be overfished (https://www.montereybayaquarium.org/animals/animals-a-to-z/giant-pacific-octopus). Makes up 0.70% of total catch and 3.52% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Northern rockfish – RFM and MSC certified; not overfished
- Other large sculpins – Grouping makes up 0.37% of total catch and 1.87% of total bycatch; however, this is a complex that is made up of several sculpin species so no single species is likely to be main associated species. It is unlikely that the fishery under assessment is negatively impacting the species.
- Other sculpin – Grouping makes up 0.18% of total catch and 0.89% of total bycatch; however, this is a complex that is made up of several sculpin species so no single species is likely to be main associated species. It is unlikely that the fishery under assessment is negatively impacting the species.
- Other skate – Grouping makes up 2.16% of the total catch and 10.81% of the total bycatch; however, this is a complex that is made up of several skate species so no single species is likely to be main associated species. Additionally, the "other skate" complex is not likely to be in an overfished state (Ormseth 2021).
- Pacific ocean perch – RFM and MSC certified; not overfished
- Pollock – RFM and MSC certified; not overfished
- Rex sole – RFM and MSC certified; not overfished
- Rock sole – MSC certified; not overfished
- Sablefish – RFM and MSC certified; not overfished
- Sea star – Grouping makes up 0.69% of total catch and 3.46% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Spiny dogfish – Does not appear to be overfished (https://www.fisheries.noaa.gov/species/pacific-spiny-dogfish). Makes up 1.17% of total catch and 5.85% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- State-managed rockfish – Makes up 0.12% of total catch and 0.59% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Thornyhead rockfish – Makes up 0.06% of total catch and 0.28% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.

- Yellow Irish lord – Makes up 0.62% of total catch and 3.08% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Yelloweye rockfish – Makes up 0.18% of total catch and 0.92% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.

Therefore, the above details combined with operational measures employed by industry to meet the specific targets are effective at achieving the specified management objectives.

Evidence Basis:
Verified observer data show that each of the BSAI and GOA Pacific cod fisheries have limited non-target catches with Pacific cod making up around 82% and 80%, respectively. Also, there is extensive evidence, including FMPs and in-season catch reporting, which are all publicly available through NMFS and Council websites.

References:

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.
NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.
Ormseth, O.A. 2021. 18. Partial assessment of the skate stock complex in the Bering Sea and Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/BSAIskate.pdf.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.2 The fishery management organization shall consider the most probable adverse impacts of the unit of certification on minor associated species (RFM v2.1 Guidance Appendix 1, Parts 3 and 7[9]), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) shall be monitored and shall not threaten these non-target species 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.

Evaluation Parameters

[9] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on minor associated species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such 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. If information has been utilized from generic evidence based on similar fishery situations (proxies), then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on minor associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species 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 is taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on minor associated species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do 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 is taken. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
The principal mechanism for directing measures to minimize catch, waste, and discards of non-target species (both fish and non-fish species) and impacts on associated species is the FMPs (for the BSAI and GOA). To manage incidental catch and to reduce bycatch and waste, the FMPs specify the following objectives:

1. Continue and improve current incidental catch and bycatch management program.
2. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
3. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
4. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
5. Continue to manage incidental catch and bycatch through seasonal distribution of total allowable catch and geographical gear restrictions.
6. Continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target and non-commercial species.
7. Reduce waste to biologically and socially acceptable levels.
8. Continue to improve the retention of groundfish where practicable, through establishment of minimum groundfish retention standards.

The setting of retention requirements the FMP process provides a mechanism by which the catch, waste, and discarding of non-target species is minimized. The extent and efficacy of these measures also limits impact of the fishery on associated species.

Current Status/Appropriateness/Effectiveness:
There is a comprehensive set of measures in place to minimize catch, waste, and discards of non-target species, as described above. Each of the BSAI and GOA Pacific cod fisheries have limited non-target catches with Pacific cod making up around 82% and 80%, respectively (Table 18 and Table 19).

<u>BSAI fishery</u>

For the BSAI fishery, there are several minor associated species with almost all making up less than 0.45% of the total average catch. The main associated species include:

- Arrowtooth flounder – RFM and MSC certified; not overfished

- Atka mackerel – RFM and MSC certified; not overfished
- Benthic urochordata – Grouping makes up 0.04% of total catch and 0.22% of total bycatch; however, this is a complex that is made up of several urochordata species so it is unlikely that the fishery under assessment is negatively impacting the species.
- Big skate –Makes up 0.04% of total catch and 0.24% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Bigmouth sculpin – Makes up 0.14% of total catch and 0.77% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Flatfish (unidentified) – Grouping makes up 0.03% of total catch and 0.16% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Flathead sole – RFM and MSC certified; not overfished
- Giant grenadier – Makes up 0.04% of total catch and 0.21% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Great sculpin – Makes up 0.22% of total catch and 1.24% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Greenland turbot – RFM certified; not overfished
- Kamchatka flounder – RFM and MSC certified; not overfished
- North Pacific octopus – Does not appear to be overfished (https://www.montereybayaquarium.org/animals/animals-a-to-z/giant-pacific-octopus). Makes up 0.17% of total catch and 0.96% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Northern rockfish – RFM certified; not overfished
- Other large sculpins – Grouping makes up 0.43% of total catch and 2.41% of total bycatch; however, this is a complex that is made up of several sculpin species so it is unlikely that the fishery under assessment is negatively impacting the species.
- Other sculpin – Grouping makes up 0.30% of total catch and 1.68% of total bycatch; however, this is a complex that is made up of several sculpin species so it is unlikely that the fishery under assessment is negatively impacting the species.
- Sablefish – RFM and MSC certified; not overfished
- Scypho jellies – Grouping makes up 0.05% of total catch and 0.27% of total bycatch; however, this is a complex that is made up of several scypho jelly species so it is unlikely that the fishery under assessment is negatively impacting the species.
- Sea anemone (unidentified) – Grouping makes up 0.04% of total catch and 0.25% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Sea star – Grouping makes up 0.22% of total catch and 1.27% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Snails – Grouping makes up 0.03% of total catch and 0.18% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Starry flounder – Does not appear to be overfished (https://www.fishbase.se/summary/Platichthys-stellatus.html). Makes up 0.06% of total catch and 0.34% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.
- Yellow Irish lord – Makes up 0.10% of total catch and 0.58% of total bycatch so unlikely that the fishery under assessment is negatively impacting the species.

Therefore, the above details combined with operational measures employed by industry to meet the specific targets are effective at achieving the specified management objectives.

GOA fishery

For the GOA fishery, there are several minor associated species with all making up ≤0.05% of the total average catch. (Given the large number of minor associated species but the low catch rate, the assessment team has determined that it is unnecessary to list each one of them here. Refer to Table 19 for more details.) Overall, none of the minor associated species are overfished so none are likely to be negatively impacted by the fishery under assessment. Therefore, these details combined with operational measures employed by industry to meet the specific targets are effective at achieving the specified management objectives.

Evidence Basis:
Verified observer data show that each of the BSAI and GOA Pacific cod fisheries have limited non-target catches with Pacific cod making up around 82% and 80%, respectively. Also, there is extensive evidence, including FMPs and in-season catch reporting, which are all publicly available through NMFS and Council websites.

References:

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.
NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.
Ormseth, O.A. 2021. 18. Partial assessment of the skate stock complex in the Bering Sea and Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/BSAIskate.pdf.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.3 There shall be outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).

FAO Eco (2011) 41.1

Evaluation Parameters

Process: *There is a process to set outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).*

Current Status/Appropriateness/Effectiveness: *There is evidence that outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible) have been achieved. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives for non-target species (i.e., avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible). Examples may include fishery management reports, and stock or ecosystems assessment reports.*

Evaluation (per parameter)

Process:

Assessments are carried out (at some level of the NMFS Tier 1-5 assessment process) on all significant non-target fish and invertebrate stocks. Estimated overfishing levels and ABC levels for these stocks are reviewed annually. Management plans have been developed for each species or species complex. The process of setting overfishing levels and ABCs is as described in Section 3.3. This involves assessments through the Plan Team meetings, SAFE assessments, and SSC and Council reviews.

Current Status/Appropriateness/Effectiveness:
Overfishing levels and ABCs are set for each species and species complex. Currently, no species or complex is being fished beyond the overfishing level. The "other skate" complex made up the majority of bycatch for the fishery under assessment; however, the complex is not overfished (Ormseth 2021; Table 22). It is also noted that environmental monitoring and modelling allows the effects of wider environmental influences to be considered in the setting of indicator levels.

Table 22. Harvest recommendations for the "other skate" complex. Source: Ormseth (2021)

other skate harvest recommendations				
	As estimated or specified last year for:		As estimated or recommended this year for:	
Quantity	2021	2022	2022	2023
M (natural mortality rate)	0.1	0.1	0.1	0.1
Tier	5	5	5	5
Biomass (t)	107,174	107,174	107,174	107,174
F_{OFL}	0.10	0.10	0.10	0.10
$maxF_{ABC}$	0.075	0.075	0.075	0.075
F_{ABC}	0.075	0.075	0.075	0.075
OFL (t)	10,717	10,717	10,717	10,717
maxABC (t)	8,038	8,038	8,038	8,038
ABC (t)	8,038	8,038	8,038	8,038
Status	As determined *last* year for:		As determined *this* year for:	
	2019	2020	2020	2021
Overfishing	No	n/a	No	n/a

Evidence Basis:
SAFE reports, FMPs, minutes from SSC and Council meetings, and Plan Team responses are all publicly available through NMFS and Council websites.

References:

NOAA Fisheries. 2022a. 2021 North Pacific Groundfish Stock Assessments. https://www.fisheries.noaa.gov/alaska/population-assessments/2021-north-pacific-groundfish-stock-assessments.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.
NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.
Ormseth, O.A. 2021. 18. Partial assessment of the skate stock complex in the Bering Sea and Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/BSAIskate.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.4 The fishery management organization shall consider the most probable adverse impacts of the unit of certification on ETP species (RFM v2.1 Guidance Appendix 1, Parts 4 and 7[10]), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.

Evaluation Parameters

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on ETP species. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies) 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. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on ETP species (e.g. negatively impacting rebuilding efforts), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these impacts are monitored and do not impede, slow, or reduce likelihood of recovery of the species to target levels (or other planned outcomes). If such impacts arise, effective remedial actions are taken.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on ETP species, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do 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 are taken. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
There is a process in place for the development of management objectives to ensure that endangered species are protected from adverse impacts from interactions with the unit of certification. The basis of protection of endangered species is Appendix I of the CITES, the ESA, and the MMPA. CITES is a multilateral treaty established to protect endangered plants and animals. It was drafted

[10] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

at a meeting of members of the IUCN and became effective in 1975. It aims to ensure that the international trade of wild animals and plants does not threaten the survival of these species, and it extends varying degrees of protection to more than 35,000 animal and plant species. Each CITES-protected species is assigned an appendix, which specifics the extent of the threat and the trade controls applied to that species. CITES Appendix I, the highest level, includes the species that are threatened with extinction and are, or may be, affected by trade. The endangered species inhabiting the BSAI and GOA are primarily under the responsibility of the USFWS for seabird species and NOAA Fisheries for other protected species. For these fisheries, this is primarily marine mammals.

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

The ESA was established in 1973 and carries out the provisions in CITES. The ESA aims to conserve endangered and threatened fish, wildlife, and plant species and is administered by USFWS and NOAA Fisheries. With regard to fishing activities, the USFWS allows a certain level of "incidental take" (IT) of a listed species in cases where "an action may adversely affect a species but not jeopardize its continued existence" (USFWS 2015).

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

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

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

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

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

Objectives set out in the BSAI and GOA FMPs are:

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

NMFS annually categorizes all U.S. commercial fisheries under the MMPA List of Fisheries according to the levels of marine mammal mortality and serious injury (https://www.fisheries.noaa.gov/national/marine-mammal-protection/list-fisheries-summary-

tables). Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤1% of the marine mammal's PBR level and total fishery-related mortality <10% of PBR. Any fishery in Category III is considered to have achieved the target level of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that is >1% but is <50% of the stock's PBR level, if total fishery related mortality is ≥10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥50% of PBR. The BSAI Pacific cod pot fishery is a Category II (occasional interactions), and the BSAI Pacific cod longline and trawl and the GOA Pacific cod longline and trawl are Category III (remote likelihood or no known interaction). (As of 2021, the other gears were no longer classified due to the lack of any interactions in the last three year.) Observer program data provide annual estimates of takes of endangered species – fish, seabirds, and marine mammals in the BSAI and GOA Pacific cod fisheries.

BSAI fishery

Mammals
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) – pot 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). Overall, these species' populations appear to be stable or increasing. Overall, all of these catch numbers are significantly less than the species' PBRs (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). Considering the cumulative impacts of all certified BSAI fisheries, the catch numbers are also below PBRs.

Regarding Steller sea lions, there has been a sustained increase in the population size in the BS with some decreasing in the AI. Work is ongoing to determine which life history traits (age-specific reproductive or survival rates) are implicated in the regional dynamics of Steller sea lions and to better understand the links between foraging behavior, diet, and population dynamics. Once completed these studies may provide new insight into the factors underlying recent population trends. Additionally, mitigation measures are in place to limit interactions (e.g., closed areas for Steller sea lion breeding; NOAA Fisheries 2022c, d).

Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. For marine mammals whose foraging and prey preferences overlap with the fishery, fishery removals could potentially adversely affect the amount or distribution of prey. Accordingly, habitat essential to endangered species is identified according to regulatory requirements (ESA and MMPA). NOAA Fisheries has designated critical habitat for Steller sea lions in AI and GOA, including 3 nm no-entry zones around rookeries and haulouts, prohibition of groundfish trawling within 10-20 nm of certain rookeries, and three special aquatic foraging areas in Alaska: the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area (Figure 19). These management measures are relevant to all BSAI and GOA fisheries, ensuring that cumulative impacts on Steller sea lions are limited.

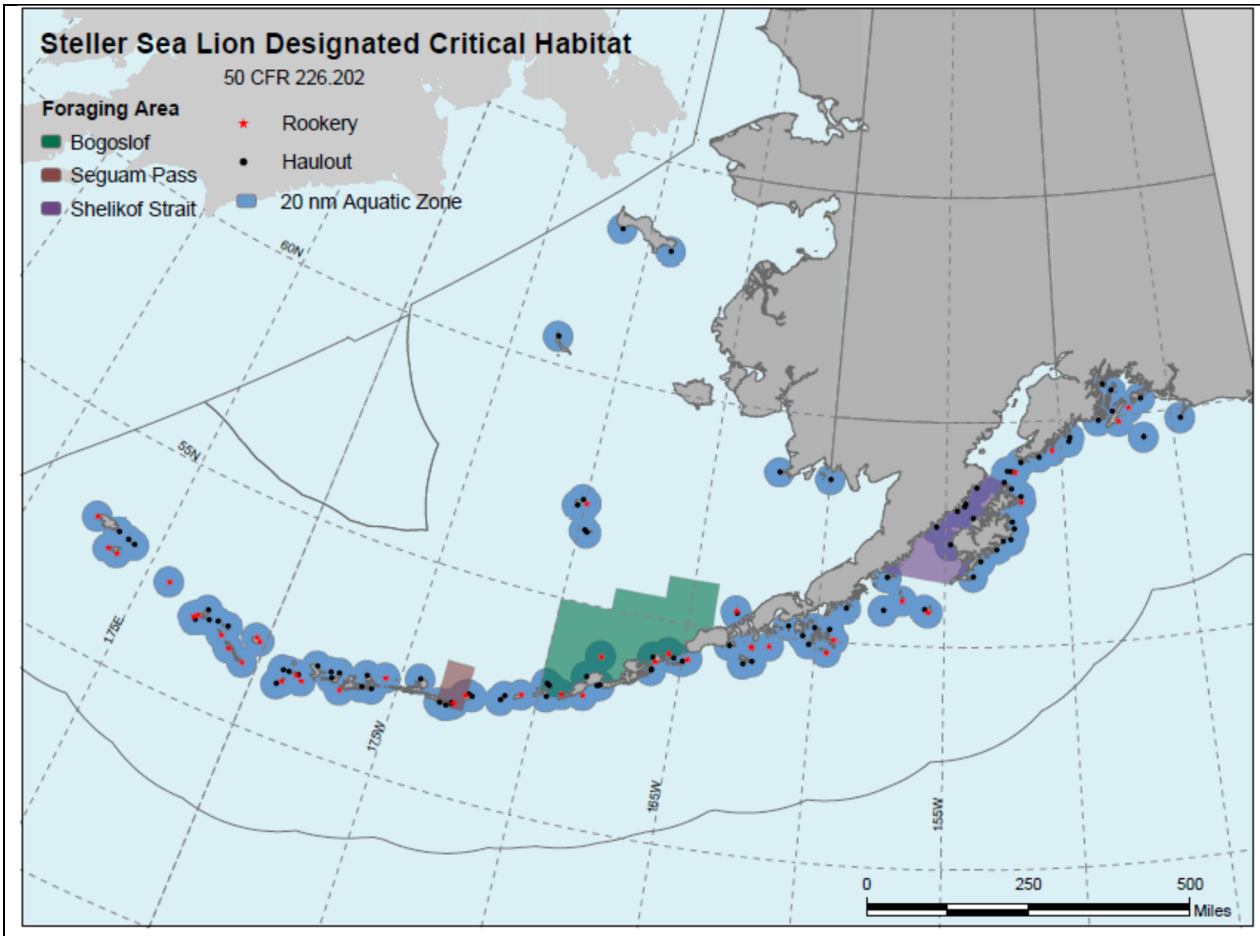

Figure 19. Designated critical habitats areas in the AI and GOA for the Steller sea lion. Source: NOAA Fisheries 2022d

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 in 2015-2019 or in 2021 (Krieger and Eich 2021). Considering the cumulative impacts of all certified BSAI fisheries, the catch numbers are also below limits.

Salmon
Three ESA-threatened salmon stocks that migrate to Alaskan waters include Lower Columbia River Chinook salmon, upper Willamette River Chinook salmon, and Lower Columbia River Chinook, spring. The bycatch of ESA-listed Chinook salmon by the BSAI Pacific cod fishery has steadily decreased since 2017, and all recent catch totals remain well below the 45,000 PSC limit. Data continue to be collected, and the bycatch numbers are analyzed annually (NOAA Fisheries 2021, 2022b). Cumulatively, the catch numbers are also below limits.

GOA fishery

Mammals
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.) Cumulatively, the catch numbers are also below the PBR. 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. Recent surveys indicate that in the GOA pup and non-pup numbers have increased, showing positive population trends.

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. The incidental take limit for short-tailed albatross is 6 over a two-year period (USFWS 2015). None were taken in 2017-2019 or 2021. In 2020, the longline fleet took 11 short-tailed albatrosses, which over a two-year period is an average of 5.5 birds so is within the limit.

Salmon
The bycatch of ESA-listed Chinook salmon by the GOA Pacific cod fishery had steadily decreased since 2017, but there was a large increase in 2021. However, the amounts have been well 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 (NOAA Fisheries 2021, 2022b). Cumulatively, the catch numbers are also below limits.

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

References:

Delean, B.J., V.T. Helker, M.M. Muto, K. Savage, S. Teerlink, L.A. Jemison, K. Wilkinson, J. Jannot, and N.C. Young. 2020. Human-Caused Mortality and Injury of NMFS-Managed Alaska Marine Mammal Stocks 2013-2017. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-401 86 p.

Dragoo, D.E., H.M. Renner, and R.S.A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. U.S. Fish and Wildlife Service Report AMNWR 2019/03. Homer, Alaska.

Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. https://repository.library.noaa.gov/view/noaa/32076.

NOAA Fisheries. 2016. Final Marine Mammal Protection Act Section 101(a)(5)(E) – Negligible Impact Determination. https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0.

NOAA Fisheries. 2021. 2020 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Coded Wire Tag and Recovery Data for Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2021-10/ak-groundfish-fishery-salmon-bycatch-2020-annual-rpt.pdf.

NOAA Fisheries. 2022b. 2021 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Incidental Catch and Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2022-02/2021-chinook-incidental-catch-esa-annual-rpt.pdf.

NOAA Fisheries. 2022c. Steller Sea Lion Protection Measures. https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures.

NOAA Fisheries. 2022d. Steller Sea Lion. https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

USFWS. 2015. Biological Opinion for the Effects of the Fishery Management Plans for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Fisheries and the State of Alaska Parallel Groundfish Fisheries, December 2015. 49 pp. Available at https://meetings.npfmc.org/CommentReview/DownloadFile?p=bb553db6-1eba-47e7-bb1d-415c27b81327.pdf&fileName=B7%20BiOp%20Effects%20Grndfish%20FMPsState%20Parallel%20Fisheries.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.5 There shall be outcome indicator(s) consistent with achieving management objectives seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

FAO Eco (2011) 41

Evaluation Parameters

Process: *There is a process in place that allowing creation of effective outcome indicators seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.*

Current Status/Appropriateness/Effectiveness: *There is evidence for established outcome indicators (e.g., in a fishery management plan or other regulation) seeking to ensure that ETP species are protected (through States or international regulations) from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. Overall, fishing activity does not impede, slow, or reduce likelihood of recovery of the species to target levels or other planned outcomes. Management objectives shall be achieved accordingly. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicators seeking to ensure that ETP species are protected from adverse impacts resulting from interactions with the unit of certification and any associated enhanced fishery activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Examples may include fishery management plans, or stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
The basis of protection of endangered species is the ESA, CITES Appendix I, and the MMPA. The endangered species inhabiting the BSAI and GOA are primarily under the responsibility of the USFWS for seabird species and NOAA Fisheries for other protected species. For these fisheries, this is primarily marine mammals.

The FMPs specifically address endangered species. FMPs go through the development and review processes described elsewhere. The groundfish FMP management policy specifically includes cooperation with USFWS to protect ESA-listed species, and if appropriate and practicable, other seabird species; to maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions; to encourage programs to review

status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate; to cooperate with NOAA Fisheries and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species; to continue to account for bycatch mortality in total allowable catch accounting and improve the accuracy of mortality assessments for target, prohibited species catch, and non-commercial species; and to control the bycatch of prohibited species through prohibited species catch limits or other appropriate measures. Assessments of the effects of the Alaska groundfish fisheries on many endangered species are also provided in the Alaska Groundfish Harvest Specifications Environmental Impact Statement.

The ESA requires the relevant agency (NOAA Fisheries or USFWS) to evaluate (provide a biological opinion) on the effects of the FMPs for the GOA and groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species. Specifically, federal agencies must ensure that their activities are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. The biological opinion process has been followed, as required for Steller sea lion and Chinook salmon in relation to these fisheries under assessment.

The MMPA allows for NOAA Fisheries to issue permits for the taking of marine mammals designated as depleted because of their listing under the ESA after the agency has determined that:

- Incidental mortality and serious injury from commercial fisheries will have a negligible impact on the affected species or stock
- A recovery plan has been developed or is being developed for such species or stock under the ESA
- Where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered, and a take reduction plan has been developed or is being developed for the species or stock

Annually, NOAA Fisheries categorizes all U.S. commercial fisheries under the MMPA List of Fisheries according to the levels of marine mammal mortality and serious injury. Category III fisheries interact with marine mammal stocks with annual mortality and serious injury ≤1% of the marine mammal's PBR level and total fishery-related mortality <10% of PBR. Any fishery in Category III is considered to have achieved the target level of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that is >1% but is <50% of the stock's PBR level, if total fishery related mortality is ≥10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality ≥50% of PBR. The BSAI Pacific cod pot fishery is a Category II (occasional interactions), and the BSAI Pacific cod longline and trawl and the GOA Pacific cod longline and trawl are Category III (remote likelihood or no known interaction). (As of 2021, the other gears were no longer classified due to the lack of any interactions in the last three year.)

The designation and protection of endangered species is an integral component of the management of groundfish fisheries in BSAI and GOA. Specific outcome indicators are developed in terms of acceptable levels of impacts such that fishing is not likely to jeopardize the continued existence of protected species or destroy or adversely modify designated critical habitat under the ESA or to approach PBR levels for marine mammals under the MMPA.

Current Status/Appropriateness/Effectiveness:

BSAI fishery

Mammals
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) – pot 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). Overall, these species' populations appear to be stable or increasing. Overall, all of these catch numbers are significantly less than the species' PBRs (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region). Considering the cumulative impacts of all certified BSAI fisheries, the catch numbers are also below PBRs.

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 by the longline fleet in 2020. However, none were taken in 2015-2019 or in 2021 (Krieger and Eich 2021). Considering the cumulative impacts of all certified BSAI fisheries, the catch numbers are also below limits.

Salmon
Three ESA-threatened salmon stocks that migrate to Alaskan waters include Lower Columbia River Chinook salmon, upper Willamette River Chinook salmon, and Lower Columbia River Chinook, spring. The bycatch of ESA-listed Chinook salmon by the BSAI Pacific cod fishery has steadily decreased since 2017, and all recent catch totals remain well below the 45,000 PSC limit. Data continue to be collected, and the bycatch numbers are analyzed annually (NOAA Fisheries 2021, 2022b). Cumulatively, the catch numbers are also below limits.

GOA fishery

Mammals
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.) Cumulatively, the catch numbers are also below the PBR. 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. Recent surveys indicate that in the GOA pup and non-pup numbers have increased, showing positive population trends.

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 Pacific cod fishery had steadily decreased since 2017, but there was a large increase in 2021. However, the amounts have been well 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 (NOAA Fisheries 2021, 2022). Cumulatively, the catch numbers are also below limits.

Evidence Basis:
FMPs, protected species management plans, and biological opinion reviews are all 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.

References:

Delean, B.J., V.T. Helker, M.M. Muto, K. Savage, S. Teerlink, L.A. Jemison, K. Wilkinson, J. Jannot, and N.C. Young. 2020. Human-Caused Mortality and Injury of NMFS-Managed Alaska Marine Mammal Stocks 2013-2017. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-401 86 p.

Dragoo, D.E., H.M. Renner, and R.S.A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. U.S. Fish and Wildlife Service Report AMNWR 2019/03. Homer, Alaska.

Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. https://repository.library.noaa.gov/view/noaa/32076.

NMFS. 2016. Final Marine Mammal Protection Act Section 101(a)(5)(E) – Negligible Impact Determination. https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0.

NOAA Fisheries. 2021. 2020 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Coded Wire Tag and Recovery Data for Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2021-10/ak-groundfish-fishery-salmon-bycatch-2020-annual-rpt.pdf.

NOAA Fisheries. 2022b. 2021 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Incidental Catch and Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2022-02/2021-chinook-incidental-catch-esa-annual-rpt.pdf.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.6 The fishery management organization shall consider the most probable adverse impacts of the unit of certification on habitats (RFM v2.1 Guidance Appendix 1, Parts 5 and 7[11]), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge.

Evaluation Parameters

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on habitats. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on such 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. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP species or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse impacts of the unit of certification on habitats, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, if these impacts are likely to be irreversible or very slowly reversible, effective remedial action is taken (please see RFM v2.1 Guidance Appendix 1, Part 5, noting specifically the 3 habitat assessment elements, and Part 7 for cumulative effects evaluation[12]). Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on habitats, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target species 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 is taken. Examples may include various stock and ecosystems assessment reports.*

[11] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)
[12] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Evaluation (per parameter)

Process:
The MSA requires Councils to identify EFH for all fisheries and to "prevent, mitigate or minimize, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to HAPCs. Each NPFMC FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015, and a new review was announced in April 2022. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

The assessment of impacts first considers whether the stock is above its limit reference point. Mitigation measures would be recommended for any stock below its limit reference point if reductions in EFH are identified as a cause of stock depletion. The next criterion is whether CEA is reduced for each species and life stage. (CEA is generally taken as the 50% quantile threshold of suitable habitat.) If >10% of the CEA is impacted, further analyses are required by stock assessment authors to determine whether there is a significant correlation with life history parameters for the stock to determine any plausible stock effects. Any plausible effects would be investigated by Plan Teams and SSC; if more than minimal and not temporary, these would result in mitigation measures being recommended to the NPFMC. This would result in the Council following its FMP amendment process to mitigate adverse effects. HAPCs are sub-sites with important ecological functions or are especially vulnerable to human impacts. HAPCs are identified to or by the NPFMC according to set priorities (e.g., coral beds, seamounts, skate habitat).

Habitat essential to endangered species is identified according to regulatory requirements (ESA and MMPA). NOAA Fisheries has designated critical habitat for Steller sea lions in the Aleutian Islands (see Clause 12.2.4). All fisheries operating in BSAI and GOA must abide by these closed areas, ensuring that cumulative impacts are minimal.

Current Status/Appropriateness/Effectiveness:
Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Figure 20 shows HAPCs and other habitat closures in Alaska waters. All BSAI and GOA certified fisheries must abide by the same area closures, gear limitations, etc., which ensures that cumulative impacts on HAPCs and EFHs are minimal.

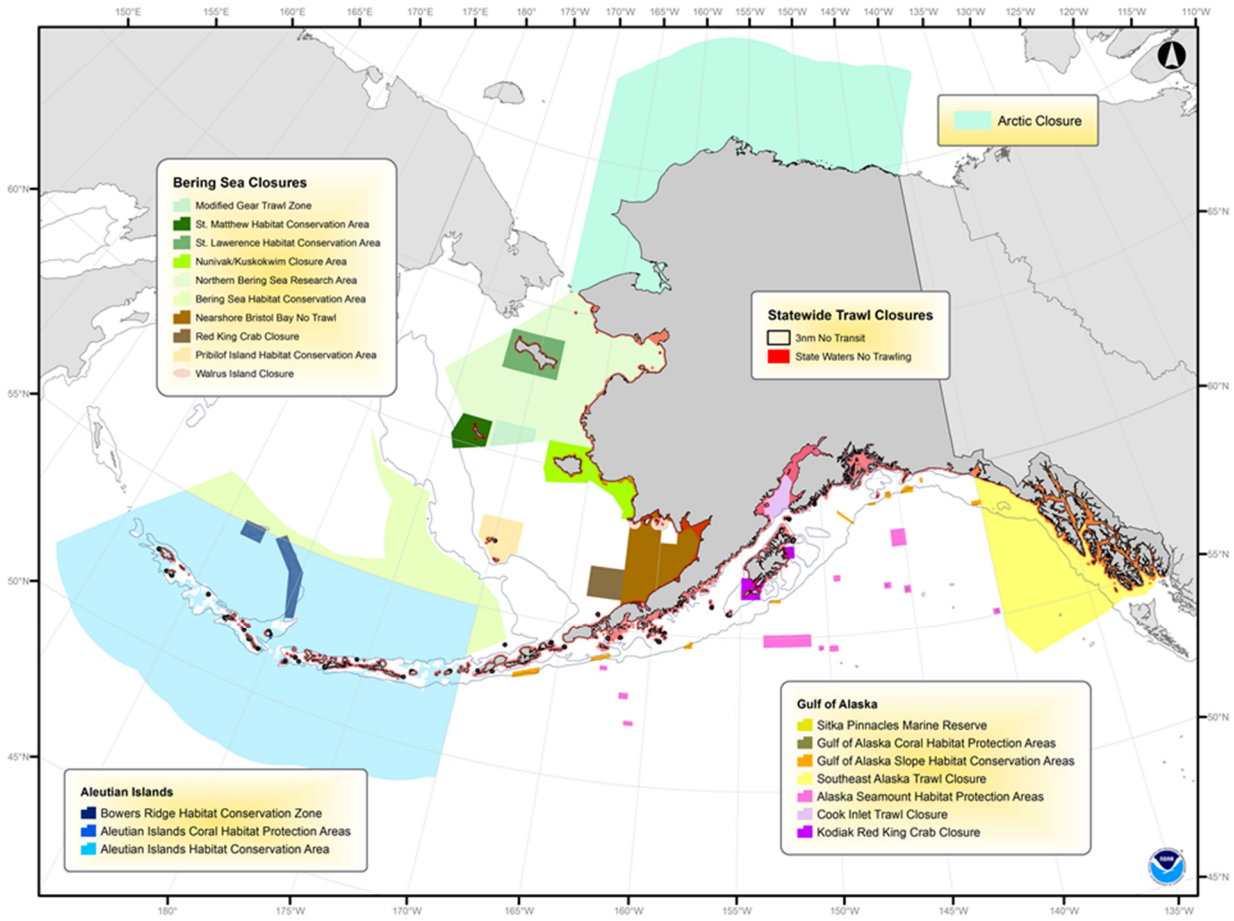

Figure 20. Closures within BSAI and GOA. Source: NOAA Fisheries

Evidence Basis:
FMPs and calls for nominations of HAPC and EFH reviews and methodologies provide fully adequate information on knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them and on habitats that are highly vulnerable to damage by the fishing gear. Information and reports are all publicly available on the NOAA Fisheries and Council websites.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

NOAA Fisheries. 2017. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.

NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.

NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

NPFMC. 2022g. Habitat Protections. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.7 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 the part of the spatial range that is potentially affected by fishing.

FAO Eco (2009) 31.3
FAO Eco (2011) 41.3

Evaluation Parameters

Process: *There is a mechanism in place by which the potential impacts of the fishery upon habitats essential to the stock under consideration and on habitats that are highly vulnerable to damage are identified. This or a similar mechanism shall also be in place to identify habitats that are highly vulnerable to fishery activities by the unit of certification. The information provided by these mechanisms shall be used to produce specific management objectives related to avoiding significant adverse impacts on habitats. The knowledge of the habitats in question can therefore include relevant traditional, fisher, or community knowledge, provided its validity can be objectively verified (i.e., the knowledge has been collected and analyzed though a systematic, objective, and well-designed process, and is not just hearsay). When identifying highly vulnerable habitats, their value to ETP species shall be considered, with habitats essential to ETP species being categorized accordingly.*

Current Status/Appropriateness/Effectiveness: *Successful management measures have been developed and are in place to achieve the objectives described in the process parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there is knowledge of the essential habitats for the stock under consideration and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved are avoided, minimized, or mitigated. In assessing fishery*

impacts, the full spatial range of the relevant habitat is considered, not just the part of the spatial range that is potentially affected by fishing. Examples may include various regulations, data, and reports.

Evaluation (per parameter)

Process:
The MSA requires Councils to identify EFH for all fisheries and to "prevent, mitigate or minimize, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to HAPCs. Each Council FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015, and a new review was announced in April 2022. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

As part of the 2015 review, EFHs throughout the EBS, AI and GOA (i.e., the full spatial range) have been modelled for all major species of groundfish and invertebrates based on available information on distributions of eggs, larvae, juveniles, and adults. This information is principally derived from bottom trawl surveys and commercial catch data. This allows the model to predict distributions of EFHs based on percentile distributions of the species abundance. Fishing effects were then added to the model based on existing literature of effects on sediment types and recovery times. This allows prediction on a monthly basis of the extent of impact and recovery on a 5x5m grid. The model specifically includes long-lived species on deep and rocky habitats.

The assessment of impacts first considers whether the stock is above its limit reference point. Mitigation measures would be recommended for any stock below its limit reference point if reductions in EFH are identified as a cause of stock depletion. The next criterion is whether CEA is reduced for each species and life stage. (CEA is generally taken as the 50% quantile threshold of suitable habitat.) If >10% of the CEA is impacted, further analyses are required by stock assessment authors to determine whether there is a significant correlation with life history parameters for the stock to determine any plausible stock effects. Any plausible effects would be investigated by Plan Teams and SSC; if more than minimal and not temporary, these would result in mitigation measures being recommended to the Council. This would result in the Council following its FMP amendment process to mitigate adverse effects. HAPCs are sub-sites with important ecological functions or are especially vulnerable to human impacts. HAPCs are identified to or by the Council according to set priorities (e.g., coral beds, seamounts, skate habitat).

There is a well-defined process in place to model the extent of EFH for each major species and to evaluate, according to set criteria, the effects of fishing. Where such effects may be appreciable, a process to evaluate and mitigate is in place within the Council. An alternative process is in place to identify priority HAPCs and to evaluate and protect them. These processes specifically include the effects of trawl fisheries. The information provided by the EFH model may be used to produce and test management measures designed to avoid significant adverse effects. Both scientific trawl survey and commercial catch data are used to inform the model.

Habitat essential to endangered species is identified according to regulatory requirements (ESA and MMPA). NOAA Fisheries has designated critical habitat for Steller sea lions in the AI (see Clause 12.2.4).

Current Status/Appropriateness/Effectiveness:
For the Pacific cod fisheries, all stocks are above their limit reference points. None of the species SAFE reports or the FMPs conclude habitat modification or loss as a concern. The BSAI and GOA are extremely large areas, making comprehensive habitat mapping difficult. Habitat has been mapped at a level of 5 km^2 grids, and while this level is likely under sampling habitat, the data provide an idea of what is occurring on the seafloor (Figure 14). Figure 15, Figure 16, and Figure 17 show the percentage of area within each grid cell that has been disturbed (2003-2017) for BS, AI, and GOA, respectively. Figure 14 shows a high occurrence of mud and sand and lesser amounts of gravel, cobble, and boulders. (Refer to Section 3.8.2 for more details on the habitats impacted by the fishery under assessment.) Therefore, it can be concluded that the relevant habitats are not affected substantively by these commercial fisheries.

Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Refer to Clause 12.2.6 and Figure 20.

Evidence Basis:
FMPs and calls for nominations of HAPCs and EFH reviews and methodologies provide fully adequate information on knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them and on habitats that are highly vulnerable to damage by the fishing gear. Information and reports are all publicly available on the NOAA Fisheries and Council websites.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.
Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.
NOAA Fisheries. 2017. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.
NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.
NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC. 2022g. Habitat Protections. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.8 There shall be outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating the impacts of the unit of certification on essential habitats for the *stock under consideration* and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

FAO Eco (2011) 41.3

Evaluation Parameters

Process: *There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating impacts on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.*

Current Status/Appropriateness/Effectiveness: *Successful outcome indicators and management measures have been developed and are in place to achieve the objectives described in the process parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing, or mitigating 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. Examples may include various regulations, data, and reports.*

Evaluation (per parameter)

Process:
The MSA requires Councils to identify EFH for all fisheries and to "prevent, mitigate or minimize, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to HAPCs. Each Council FMP contains provisions for a review of EFH issues every five years. The latest review was carried out in 2015. EFH information is also reviewed annually in the "Ecosystems Considerations" section of SAFE reports.

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

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

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

Current Status/Appropriateness/Effectiveness:
A comprehensive inventory of bottom habitat data in the BSAI and GOA has been done. The types, distributions, and vulnerability of habitats in the BSAI and GOA are known (NOAA Fisheries 2022e, f; NPFMC 2020a, b). Habitats in the AI are less well understood, but there is a basic understanding of the main types and general distributions and their vulnerabilities.

The processes for identifying effects on EFHs and for designating HAPCs have been developed to achieve the objectives described in the process parameter and have been successful in doing so. Several HAPCs have been identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Figure 20 shows HAPC and other habitat closures in Alaska waters. The FMPs, EFH report, five-year review of EFH, and NOAA data provide information that is adequate to allow for identification of the main impacts of the fisheries' gear used in the BSAI and GOA. Model estimates of long-term bottom habitat impacts of trawl gear used in the fisheries provide sufficient data to allow the nature of impact and their spatial extent to be generally determined.

The Council has implemented a combination of mitigation measures focused on limiting impact. As noted above, several closed and protected areas have been established with the intent to protect EFHs, HAPCs, and other sensitive areas. Gear modifications have also been implemented to limit trawl gear impact. Figure 15, Figure 16, and Figure 17 show the percentage of area within each grid cell that has been disturbed (2003-2017) for BS, AI, and GOA, respectively.

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

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.
Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.
NOAA Fisheries. 2017. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.
NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.
NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.
NPFMC. 2007. Aleutian Islands Fishery Ecosystem Plan. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf.
NPFMC. 2019h. Bering Sea Fishery Ecosystem Plan. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.
NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.
NPFMC. 2022g. Habitat Protections. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.9 The fishery management organization shall consider the most probable adverse impacts of the fishery under assessment on the ecosystem (RFM v2.1 Guidance Appendix 1, Part 6[13]), by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.

[13] Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1)

Evaluation Parameters

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on the ecosystem. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies) 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. If information has been utilized from generic evidence based on similar fishery situations, then, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, any of the following elements can be considered high risk for a fishery: keystone species, species with relative low growth rates or high catchability, fisheries with significant ETP species or bycatch of non-target fishery resources (or non-target stocks, species, harvests, or discards), or fisheries with important concerns for gear–habitat interactions. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse impacts of the fishery under assessment on the ecosystem (e.g., food-webs effects), by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these impacts are likely to be irreversible or very slowly reversible; or effective remedial action shall be taken. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored. There are policies in place (e.g., harvest control rules) that are effective at protecting ecosystem functioning and accounting for species' ecological role, and precautionary and effective spatial management is used (e.g., to protect spawning areas, prevent localized depletion, and protect important foraging areas for predators of fished species) if applicable.*

Current Status/Appropriateness/Effectiveness: *The bait used to capture the stock under consideration shall not be formally classified as ETP species (by a State or other international designations), and the fishery under consideration does not hinder recovery or rebuilding of overfished species that are not formally classified as ETP species and used as bait.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and or/correcting them, taking into account the best scientific evidence available and local knowledge. Accordingly, these catches (including discards) are monitored and do 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 is taken. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
Through scientific investigations of NMFS, the PSEIS provides a comprehensive evaluation of the FMPs. The SAFE process evaluates the stock status of the target species on an annual basis, considering major bycatches, effects on prohibited species (i.e., species which cannot be landed and have limits in place on total catches in a fishery sector; these are notably halibut and salmon), habitat, and a wide-ranging consideration of ecosystem indicators. These evaluations are supported by extensive monitoring programs with specific investigations on issues of concern (such as Essential Fish Habitat impacts, reductions in fur seal populations, Stellar sea lion feeding resources, and impacts on seabirds). The Council and Alaska BOF both have wide-ranging representation from the stakeholder community. In addition, Groundfish Plan Team, Ecosystem Committee, the Council, and BOF meetings are all open to public attendance. Available scientific information is therefore fundamental to the impact evaluation process and is reinforced by information and issues raised by stakeholders throughout the management process.

Significant specific information is collected on all appreciable adverse effects of the fishery on the ecosystem, using both specific scientific studies as well as views and information provided by the wider stakeholder community. These are assessed through PSEIS and routinely through the SAFE, the Council, and BOF processes. Management objectives have been developed in response to these processes: the PSEIS process led to the Council adoption of nine policy goal statements with 45 accompanying objectives. Each major stock is subject to a SAFE assessment, and specific management objectives are developed in response to any new issues arising. In 2014, the Council adopted an Ecosystem Policy, which is considered in all long-term planning initiatives, fishery management actions, and science planning to support ecosystem-based fishery management. The intent is that management explicitly takes "into account environmental variability and uncertainty, changes and trends in climate and oceanographic conditions, fluctuations in productivity for managed species and associated ecosystem components, such as habitats and non-managed species, and relationships between marine species" and incorporates "the best available science, including local and traditional knowledge, and engage scientists, managers, and the public" (NPFMC 2017).

Current Status/Appropriateness/Effectiveness:

Management measures are in place, based on a sound and fishery-related evidence platforms and extensive evaluations, designed to achieve the stated objectives for relevant ecosystem components. These specifically include marine mammals, seabirds, prohibited species, target and bycatch species, essential fish habitat, Habitat Areas of Particular Concern, and food-web effects. As such, information and objectives are specific to the fishery and/or fishery management system, and use of more generic information is not considered necessary.

Current Status/Appropriateness/Effectiveness:
As in previous years, squid, saury, and herring, depending on availability and market factors, continue to be the main bait species. Herring was the primary bait years ago, but now it is squid, specifically illex squid from the US east coast. If the market or supply for illex is not good, then Argentine squid is used (or to a much lesser extent Dutch Harbor squid). Saury is used if squid is not available. Herring is still utilized for bait, albeit to a lesser extent than was once the case. In short, none of these species is ETP.

Evidence Basis:
There is an extensive evidence base setting out the evaluation of potential adverse effects of the fishery, the management objectives related to these, the measures in place to achieve the objectives, and ongoing monitoring of the effectiveness of these measures. These are all publicly available through NMFS and Council websites.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

NMFS. 2015. Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS). https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis.

NMFS. 2016. Final Marine Mammal Protection Act Section 101(a)(5)(E) – Negligible Impact Determination. https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0.

NOAA Fisheries. 2017. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.

NOAA Fisheries. 2022c. Steller Sea Lion Protection Measures. https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures.

NOAA Fisheries. 2022d. Steller Sea Lion. https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management.

NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.

NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.

NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.

NPFMC. 2022g. Habitat Protections. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/.

NPFMC. 2022h. Management Policies. https://www.npfmc.org/how-we-work/management-policies/.

NPFMC. 2022i. Salmon Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/salmon-bycatch/.

NPFMC. 2022j. Crab Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/crab-bycatch/.

NPFMC. 2022k. Halibut Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/halibut-bycatch/.

Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.

Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.10 There shall be outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhanced activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration must be reversible and not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function.

FAO Eco (2011) 36.9, 41

Evaluation Parameters

Process: *There is a process to allow for drafting effective outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. There is also a process that states modifications to the habitat for enhancing the stock under consideration are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function.*

Current Status/Appropriateness/Effectiveness: *There is evidence for outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function. Reversibility refers to the effects of a process or condition capable of being reversed so that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives seeking to minimize adverse impacts of the unit of certification (including any fishery enhancement activities) on the structure, processes, and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and do not cause serious or irreversible harm to the natural ecosystem's structure, processes, and function. Examples may include various regulations, data, and reports.*

Evaluation (per parameter)

Process:
The preceding clauses have described the ecosystem management applied in BSAI and GOA. This has included setting precautionary TACs for all target species, including groundfish, based on ABC and overfishing levels but also considering trends in ecosystem indicators. In the past, TACs have been adjusted in relation to such trends. This is considered the most significant and effective outcome indicator.

Endangered species, prohibited species, seabirds, and marine mammals are all subject to indicators of status and accompanying limits on mortalities within the groundfish fishery. Habitats are also subject to ongoing monitoring and evaluation by stock assessment authors, Plan Teams, SSC, and the Council. EFHs and HAPCs are subject to separate evaluation, designation, mitigation, and monitoring. There are no enhancement activities associated with the groundfish fisheries, including no modifications to the habitat for enhancing the stock under consideration.

Ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

The Council approach to groundfish fisheries explicitly includes for ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. This includes the setting of outcome indicators relating to preserving the food web, managing incidental catch, avoidance of impacts on seabirds and mammals and reduce and avoid impacts to habitats.

Current Status/Appropriateness/Effectiveness:
As outlined previously, objectives, indicators, management measures and ongoing monitoring and ecosystem modelling are all in place to meet the overarching objective of effective ecosystem-based management.

Evidence Basis:
SAFE assessments (including ecosystem indicators and essential fish habitat evaluations) for each species are published annually, together with endangered species management plans, marine mammal monitoring, and management measures. Developments in ecosystem modelling are published in the scientific press and NOAA Fisheries website. All information is readily available through NOAA Fisheries and Council websites.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

NMFS. 2010. Endangered Species Act Section 7 Consultation Biological Opinion: Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Bering Sea And Aleutian Islands Management Area, Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Gulf of Alaska, State of Alaska Parallel Groundfish Fisheries. https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska.

NOAA Fisheries. 2012. Resource Ecology and Ecosystem Modeling Program: Forage Euphausiids Abundance in Space and Time (FEAST). https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm.

NOAA Fisheries. 2022g. Alaska Groundfish Harvest Specifications. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications.

NOAA Fisheries. 2022h. https://www.integratedecosystemassessment.noaa.gov/regions/alaska/alaska-eastern-bering-sea-integrated-ecosystem-assessment-modeling.

NPFMC. 2007. Aleutian Islands Fishery Ecosystem Plan. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf.

NPFMC. 2019c. Bering Sea Fishery Ecosystem Plan. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.

Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.

Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.

Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.2.11 The fishery management organization shall consider the most probable adverse human impacts on the stock/ecosystem under consideration, by assessing and, where appropriate, addressing and or/correcting them, taking into account available scientific information and local knowledge.

Evaluation Parameters

Process: *There is a process that accounts for the most probable adverse impacts of the unit of certification on the ecosystem. This may take the form of an immediate management response or a further analysis of the identified risk. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations (proxies" 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.*

Current Status/Appropriateness/Effectiveness: *There is evidence that the fishery management organization considers the most probable adverse human impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and/or correcting them, taking into account available scientific information and local knowledge. Accordingly, these impacts are likely to be irreversible or very slowly reversible; if so, effective remedial action shall be taken. Reversibility refers to the effects of a process or condition capable of being reversed or that the previous state is restored.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization considers the most probable adverse impacts of the unit of certification on the ecosystem, by assessing and, where appropriate, addressing and/or correcting them, taking into account available scientific information and local knowledge. Accordingly, these catches (including discards) are monitored and do not threaten these non-target stocks with serious risk or extension, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action is taken. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
Adverse environmental effects on fish resources from fishery-related activities are evaluated through a PSEIS. The 2004 Alaska Groundfish Fisheries PSEIS evaluated the cumulative changes in the management of the groundfish fisheries since the implementation of the BSAI and GOA FMPs and considered a broad array of policy-level programmatic alternatives. On the basis of the analysis, the Council adopted a management approach statement, policy goal statements, and accompanying objectives.

Periodically, the Council conducts a review of the policy goal statements and objectives to assess how they are being implemented and to see whether changes are warranted. They also reviewed factors that may influence the timing for supplementing or updating the 2004 PSEIS.

NEPA requires agencies to prepare a supplemental EIS (SEIS) to either draft or final EISs if the agency (1) makes substantial changes in the proposed action that are relevant to environmental concerns or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. An SEIS is required if the new information is sufficient to show a proposed or remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered. In April 2014, the Council evaluated whether the triggers for supplementing the PSEIS have been met and concluded both that a supplemental EIS was not required and that they did not choose to reinitiate programmatic changes to the groundfish fisheries that would necessitate a SEIS. NMFS has since reached a determination affirming that the 2004 PSEIS continues to provide NEPA compliance for the groundfish FMPs (NMFS 2015).

Current Status/Appropriateness/Effectiveness:
The requirements of NEPA set a legislative framework for the evaluation of adverse effects from human activities. This is enacted through the PSEIS process (and subsequent reviews) for fishery-related effects and through EISs by the relevant organizations for non-fishery related effects, in which NOAA Fisheries, Council, and ADFG would be consulted, as appropriate. There is clear evidence that appropriate assessments have been carried out and reviewed for fishery-related effects (notably the 2004 PSEIS and 2014 review).

Evidence Basis:
The PSEIS and review documents are publicly available (e.g., NMFS 2015).

References:

NMFS. 2015. Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS). https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.3 The role of the *stock under consideration* in the food web shall be considered, and if it is a key prey species[14] in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.

FAO Eco (2009) 31.2
FAO Eco (2011) 41.2

Evaluation Parameters

[14] See Appendix 1 page 150 of the Guidance to Performance Evaluation for the Certification of Wild Capture and Enhanced Fisheries in North America (v2.1).

Process: *There is a mechanism in place by which the role of the stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined. If the species is considered by the fisheries management organization to be an important prey species, there shall be specific management objectives relating to minimizing the impacts of the fishery on dependent predators. The FAO Guidelines require that all sources of fishing mortality on the stock under consideration are taken into account (whether or not it is a prey species) in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches, and catches in other fisheries.*

Current Status/Appropriateness/Effectiveness: *Management measures have been developed and are in place to achieve the management objectives described in the process parameter, and there is evidence to demonstrate that they are successful to this end. If the species under assessment is not considered to be a key prey species, then this parameter shall be considered fulfilled.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the role of the stock under consideration in the food web is considered, and if it is a key prey species in the ecosystem, objectives and management measures are in place to avoid severe adverse impacts on dependent predators. Examples may include various stock and ecosystem assessment reports.*

Evaluation (per parameter)

Process:
The role of each stock in the food web is specifically considered in the EBS, AI, and GOA systems. This includes specific monitoring and evaluation of ecosystem interactions, notably through the ecosystem indicators reported to the stock assessment authors and considered at the Plan Team, SSC, and Council deliberations. These indicators include physical conditions and prey and predator indicators, such as mesozooplankton, copepod size, capelin populations, apex fish biomass, and Steller sea lions and northern fur seal success.

In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

The use of ecosystem monitoring and modelling information is specifically required or requested by the Council, notably the use of ecosystem indicators in the SAFE process, multispecies models, and the FEAST spatial model (although these are used more in EBS than in the AI or GOA). This therefore provides a mechanism by which the role of the stocks under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined and evaluated. While Pacific cod is prey for seabirds and the endangered Steller sea lion, it is not the primary food source. It is noted that through catch reporting and observer monitoring of all fleets, all sources of F on the stocks under consideration are taken into account in assessing the state of the stocks under consideration, including discards, unobserved mortality, incidental mortality, unreported catches, and catches in other fisheries.

Current Status/Appropriateness/Effectiveness:
The development of ecosystem indicators and models and the incorporation of these into stock assessments and Plan Team, SSC, and the Council evaluation process allow for the ongoing development of management measures to achieve the management objectives. These may include precautionary adjustments of TACs and designation of essential habitat for mammalian predators.

Evidence Basis:
The ecosystem indicators and other ecosystem modelling information used in the SAFE assessments, endangered species management plans, and the outcomes of SSC and Council evaluations are all publicly available on the NMFS and Council websites.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

NOAA Fisheries. 2012. Resource Ecology and Ecosystem Modeling Program: Forage Euphausiids Abundance in Space and Time (FEAST). https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm.

NOAA Fisheries. 2022h. https://www.integratedecosystemassessment.noaa.gov/regions/alaska/alaska-eastern-bering-sea-integrated-ecosystem-assessment-modeling.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.4 There shall be outcome indicator(s) consistent with achieving management objectives seeking 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.[15]

FAO Eco (2011) 41.2

Evaluation Parameters

Process: *There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives seeking 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.[16] Mortality is usually accounted for all removals of given species. The state and federal fish accounting systems operate in depth and make an explicit effort to document all removals to confirm with*

[15] See Appendix 1 page 150 of the Guidance to Performance Evaluation forthe Certification of Wild Capture and Enhanced Fisheries in North America (v2.1).
[16] General harvest guidelines based on Lenfest report: "in fisheries with an intermediate level of information (which will include most well-managed forage fisheries), there must be at least 40% of virgin or unfished biomass (B0) left in the water, and fishing mortality should be no higher than 50% of FMSY. Low information fisheries should leave at least 80% of B0 in the water. High information fisheries (which have a high information not just on the fished stock, but the full ecosystem), may exceed these reference points if justified by the science, but in no case should fishing mortality exceed 75% of FMSY or biomass fall below 30% of B0. Link: http://www.lenfestocean.org/~/media/legacy/lenfest/pdfs/littlefishbigimpact_revised_12june12.pdf?la=en

regulations in force. The assessors shall ensure that all removals are accounted for in the system (fish ticket, eLandings) for stock assessment and management purposes.

Current Status/Appropriateness/Effectiveness: *There is evidence that outcome indicators and management measures have been developed, are in place, and have succeeded in achieving the objectives described in the process parameter.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that there are effective outcome indicator(s) consistent with achieving management objectives seeking 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. Examples may include various stock and ecosystems assessment reports.*

Evaluation (per parameter)

Process:
At a fundamental level, the SAFE assessment process provides single-species stock assessments for all target groundfish species in the BSAI and GOA. These stock assessments are informed by highly accurate catch and discard data through state and federal online catch reporting, fish tickets, electronic landing, and observer data. The SAFE process provides ABCs and overfishing limits, which in turn are considered by the SSC and the Council in setting TACs for each species.

TAC-setting within the NPFMC demonstrably follows the precautionary principle. This is also informed by the range of ecosystem indicators reported to the plan teams as part of the SAFE process. These indicators include mammalian predators of groundfish (e.g., Northern fur seals, Seller sea lions), which are considered by the stock assessment plan teams, SSC, and the Council in setting TACs. For mammalian predators of groundfish (e.g., Pacific cod), outcome indicators of direct mortality are required by the MMPA and ESA in terms of allowable mortalities.

In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST) model, which is concentrated on climate/forage fish/zooplankton interactions with specific applications for Pacific cod, pollock, and arrowtooth flounder. Food-web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GOA, providing predominantly guild-level analyses of cumulative and ecosystem level indicators. The CEATTLE model combines predation between Pacific cod, pollock, and arrowtooth flounder inter- and intraspecies predation with climatic effects, aiming to develop reference points in relation to prevailing climatic conditions and multi-species ABCs.

The mechanisms in place through the catch reporting, observer program, and in-season CASs ensure that all removals are accounted. These data are then incorporated into the SAFE process, providing ABCs and overfishing limits, and then into the SSC and the Council review process in setting stock TACs. These processes also include for ecosystem indicators, including mammalian and fish apex predators. The monitoring and management of fisheries in relation to marine mammal predators includes the setting of mortality limits and additional protection measures, such as fishery exclusion from essential habitat. Developments in ecosystem modelling and multi-species modelling progress are part of the fishery management process.

Current Status/Appropriateness/Effectiveness:
There is evidence from ABCs and overfishing limits for groundfish; precautionary TACs, which include ecosystem indicators; and marine mammal mortality, habitat, and trophic management measures that outcome indicators and management measures are in place that have been developed to achieve the objectives described in the process parameter. In terms of maintaining groundfish populations at sustainable levels and implementing measures to protect mammalian predators, these have been demonstrably successful.

Evidence Basis:
SAFE assessments (including ecosystem indicators) for each species are published annually, together with endangered species management plans, marine mammal monitoring, and management measures. Developments in ecosystem modelling are published in the scientific press and are included in the SAFE assessments, where relevant.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

Ferriss, B. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Gulf of Alaska. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOAecosys.pdf.

NOAA Fisheries. 2012. Resource Ecology and Ecosystem Modeling Program: Forage Euphausiids Abundance in Space and Time (FEAST). https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm.

NOAA Fisheries. 2022g. Alaska Groundfish Harvest Specifications. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications.
NOAA Fisheries. 2022h. https://www.integratedecosystemassessment.noaa.gov/regions/alaska/alaska-eastern-bering-sea-integrated-ecosystem-assessment-modeling.
NPFMC. 2007. Aleutian Islands Fishery Ecosystem Plan. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf.
NPFMC. 2019c. Bering Sea Fishery Ecosystem Plan. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.
NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIecosys.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.5 States shall introduce and enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

FAO CCRF (1995) 8.7.1

Evaluation Parameters

Process: *The appropriate regulations have been implemented.*

Current Status/Appropriateness/Effectiveness: *These regulations and their enforcement are effective and in line with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the State has introduced and enforces laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). Examples may include various regulations, data, and reports.*

Process:
The United States has enacted the Act to Prevent Pollution from Ships of 1980, implementing the provisions of MARPOL annexes to which the United States is a party. The Act is applicable to all U.S.-flagged ships anywhere in the world and to all foreign-flagged vessels operating in navigable waters of the United States or while at port under U.S. jurisdiction. Regulations are produced by the Environmental Protection Agency in consultation with the U.S. Coast Guard. Relevant laws and accompanying regulations to implement MARPOL 73/78 have been introduced through federal legislation and agencies.

Specifically, all fishing vessels operating in federal waters are required to comply with MARPOL Annex V, which specifically prohibits the at-sea disposal of all plastics. Vessels operating in the North Pacific therefore have three options: 1) non-plastics can be disposed of at sea within the legal restrictions, 2) they can incinerate wastes onboard the vessel, or 3) they can hold the wastes for shoreside disposal at port. Vessels are required to post oil pollution and garbage placards; have a written solid waste management plan that describes procedures for collecting, processing, storing, and discharging garbage; and have a designated person in charge of carrying out the plan. Together with Coast Guard inspections, observers are also tasked with monitoring for compliance with these Code of Federal Regulations.

Current Status/Appropriateness/Effectiveness:
The United States has demonstrably introduced and continues to enforce laws and regulations based on MARPOL 73/78.

Evidence Basis:
Laws and regulations are publicly available to view. The USCG and Observer Program have each been reviewed elsewhere in the standard, and both are considered to be effective in enforcing regulations.

References:

96th US Congress. 1980. An Act to implement the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and for other purposes.
Code of Federal Regulations. 2001. https://www.govinfo.gov/content/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml.
Code of Federal Regulations. 2012. https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol2/xml/CFR-2012-title33-vol2-part155.xml.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

12.6 Research shall be promoted on the environmental and social impacts of fishing gear especially on the impact of such gear on biodiversity and coastal fishing communities.

FAO CCRF (1995) 8.4.8, 7.6.4

Evaluation Parameters

Process: *Research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities, as applicable to the fishery.*

Current Status/Appropriateness/Effectiveness: *There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that research is promoted on the environmental and social impacts of fishing gear especially the impact of such gear on biodiversity and coastal fishing communities. Examples may include various regulations, data, and reports.*

Evaluation (per parameter)

Process:
The Council's overarching policy includes the objective of applying judicious and responsible fisheries management practices, based on sound scientific research and analysis. Also, all management measures are to be based on the best scientific information available.

Key to delivering this scientific evidence base is the work of the AFSC. The AFSC has a five-year strategic research plan based on three goals. The relevant AFSC plan elements include:

1. "Monitor and assess fish, crab, and marine mammal populations, fisheries, and marine ecosystems."
    A. "Conduct high utility and quality assessments which will directly contribute to the most effective assessment tier of fish and crab, and level of excellence for marine mammal stocks, while improving efficiency of fisheries-dependent and independent data collection."
    B. "Conduct applied marine ecosystem and socioeconomic analyses and assessments to support sustainable fisheries management and marine mammal conservation."
    C. "Create next generation fish, crab, and marine mammal stock assessments."
    D. "Reduce bycatch using fishery-dependent bycatch analysis, spatial modeling, data on environmental conditions, and conservation engineering."
2. "Investigate, model, and predict ecosystem and climate impacts on living marine resources."
    A. "Investigate ecosystem-level changes (habitat, food webs, trophic dynamics, distributional shifts, etc.) with field and modeling studies."
    B. "Investigate ecosystem-level changes (habitat, food webs, trophic dynamics, distributional shifts, etc.) with field and modeling studies."
    C. "Identify and implement Arctic research priorities."
3. "Advance new initiatives and innovations."
    A. "Promote data innovation and quality improvement to facilitate science and support data-driven decision making."
    B. "Develop innovative technologies to support our mission with improved performance and cost effectiveness."
    C. "Expand 'omics research capacity."

(NOAA Fisheries 2022i)

The Southeastern BS and GOA regional action plan were developed in 2016 and 2018, respectively. Currently, there is no plan for the Aleutian Islands.

It is also noted that research is often promoted and encouraged by academic institutions, furthering the aim of the Council. Research continues into community development associated with fisheries, for example through Amendment 80 cooperatives. Industry is also regularly involved in research, such as investigating ways to minimize salmon bycatch in trawl gear, which is in response to the Council objectives for prohibited species.

Overall, research is promoted by the Council on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. This is directly applicable to the groundfish fishery.

Current Status/Appropriateness/Effectiveness:
There is evidence for this research through the research plans of the AFSC but also work carried out by universities and industry that is of relevance to the fishery (such as through the EFH review). The information being collected is considered directly appropriate for overall fisheries management purposes.

Evidence Basis:

The Council objectives, AFSC research plans, and various outputs and work of academic institutions are widely available through respective websites. Research is of high quality and applicability.

References:

Dorn, M. W., C. J. Cunningham, M. T. Dalton, B. S. Fadely, B. L. Gerke, A. B. Hollowed, K. K. Holsman, J. H. Moss, O. A. Ormseth, W. A. Palsson, P. A. Ressler, L. A. Rogers, M. A. Sigler, P. J. Stabeno, and M. Szymkowiak. 2018. A climate science regional action plan for the Gulf of Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-376, 58 p.

NOAA Fisheries. 2022i. Bering Sea and Aleutian Islands Amendment 80 Groundfish Trawl Fishery in Alaska. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/bering-sea-and-aleutian-islands-amendment-80-groundfish-trawl-fishery.

NOAA Fisheries. 2022ij Alaska Fisheries Science Center Strategic Plan FY2023-FY2027. https://www.fisheries.noaa.gov/resource/document/alaska-fisheries-science-center-strategic-plan-fy2023-fy2027.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.

NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.

NPFMC. 2022h. Management Policies. https://www.npfmc.org/how-we-work/management-policies/.

NPFMC. 2022i. Salmon Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/salmon-bycatch/.

Sigler, M., A. Hollowed, K. Holsman, S. Zador, A. Haynie, A. Himes-Cornell, P. Mundy, S. Davis, J. Duffy-Anderson, T. Gelatt, B. Gerke, and P. Stabeno. 2016. Alaska Regional Action Plan for the Southeastern Bering Sea: NOAA Fisheries Climate Science Strategy. https://repository.library.noaa.gov/view/noaa/12964.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**		**Minor NC Lacking in one parameter Score = 7**	**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐		Minor ☐	None ☒
Non-Conformance Number (if applicable):					

12.7 The fishery management organization shall make use, where appropriate, of Marine Protected Areas (MPAs). The general objectives for establishing MPAs shall include ensuring sustainability of fish stocks and fisheries and protecting marine biodiversity and critical habitats.

FAO FM/MPA (2011) 1.2

Evaluation Parameters

Process: *There is a process available for the consideration of MPAs as appropriate, as a tool for management.*

Current Status/Appropriateness/Effectiveness: *There shall be evidence for the use of MPAs, if appropriate (e.g., if they are employed MPAs as part of suite of management tools), as a tool for effective management with the general objectives of ensuring sustainability of fish stocks and fisheries and protecting marine biodiversity and critical habitats.*

Evidence Basis: *The availability, quality, and/or adequacy of the evidence is sufficient to substantiate that the fishery management organization has made use, where appropriate, of MPAs. The objectives of establishing MPAs are ensuring sustainability of fish*

stocks and fisheries and protecting marine biodiversity and critical habitats. Examples may include various regulations, data, and reports.

Evaluation (per parameter)

Process:
The MSA requires Councils to identify EFHs for all fisheries and to "prevent, mitigate or minimize, to the extent practicable" any adverse effects of fishing on EFH that are "more than minimal and not temporary". Councils are also required to give special attention to HAPCs. Each Council FMP contains provisions for a review of EFH issues every five years. Under the MSA, the Council is required to prepare and submit an FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs have to be consistent with ten national standards for fishery conservation and management (16 USC § 1851).

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

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

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

Current Status/Appropriateness/Effectiveness:
The Council has in place groundfish FMPs in the BSAI and GOA that include the Pacific cod fisheries. Within these FMPs, there is a management and policy objective to reduce and avoid impacts to habitat, specifically regarding MPAs:

- Develop a MPA policy in coordination with national and state policies.
- Develop goals, objectives, and criteria to evaluate the efficacy and suitable design of MPAs and no-take marine reserves as tools to maintain abundance, diversity, and productivity.
- Implement MPAs if and where appropriate.

Several HAPCs are identified throughout the EBS, AI, and GOA – Alaska Seamounts, Bowers Ridge, GOA Coral Habitat, GOA Slope Habitat (bottom contact gear prohibited or restricted), and skate nursery areas (monitoring priority areas). Figure 20 shows HAPCs and other habitat closures in Alaska waters. All BSAI and GOA certified fisheries must abide by the same area closures, gear limitations, etc., which ensures that cumulative impacts on HAPCs and EFHs are minimal.

Evidence Basis:
MPAs cover 26% of U.S. waters, including many within the Alaska EEZ (https://marineprotectedareas.noaa.gov/). The Council's FMPs outline the consideration and implementation of MPAs. Research is of high quality and applicability.

References:

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., Litzow, M., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, I., and Wang, M. 2021. Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.

NOAA Fisheries. 2017b. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.

NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.

NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.

NPFMC. 2020a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2020b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K., and Thompson G.G. 2021. Assessment of the Pacific cod stock in the Aleutian Islands. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/AIpcod.pdf.
Thompson, G.G., S. Barbeaux, J. Conner, B. Fissel, T. Hurst, B. Laurel, C.A. O'Leary, L. Rogers, S.K. Shotwell, E. Siddon, I. Spies, J.T. Thorson, and A. Tyrell. 2021. 2. Assessment of the Pacific cod stock in the Eastern Bering Sea. NPFMC Bering Sea and Aleutian Islands SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSpcod.pdf.

Conclusion:

Numerical Scoring:	**Starting score**	**Number of EPs NOT met**			**Overall score**
	10	- (	0	x 3) =	10
Confidence Rating:	Low (score = 1) ☐	Medium (score = 4 or 7) ☐			High (score = 10) ☒
Non-Conformance:	**Critical NC Lacking in three or more parameters Score = 1**	**Major NC Lacking in two parameters Score = 4**	**Minor NC Lacking in one parameter Score = 7**		**Full Conformance Fulfills all parameters Score = 10**
	Critical ☐	Major ☐	Minor ☐		None ☒
Non-Conformance Number (if applicable):					

6 NON-CONFORMANCES AND CORRECTIVE ACTIONS

One minor NC was raised on supporting clause 3.1 during the 4th surveillance of the previous certification cycle of the Alaska Pacific cod fishery. The corrective action plan from the client is as follows:

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 the 4th annual audit of the fishery, the reassessment of the fishery against version 2.1 of the RFM standard also commenced. In the course of discussions associated with the reassessment 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 February 2028 (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 February 2028, 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.
February 2028	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.

7 REFERENCES

16 U.S. Code § 1852 - Regional Fishery Management Councils https://www.law.cornell.edu/uscode/text/16/1852

96th US Congress. 1980. An Act to implement the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and for other purposes.

ADFG annual budgets and performance http://www.adfg.alaska.gov/index.cfm?adfg=about.budgets.

ADFG Operating Budget https://omb.alaska.gov/ombfiles/20_budget/Fish/Enacted/20depttotals_fish.pdf.

ADFG. 2021. Fishery Update 2021 Central Region Groundfish Fisheries Outlook. Alaska Department of Fish and Game P.O. Box 115526; 1255 W. 8th Street Juneau, AK 99811-5526. https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/634206707.pdf.

ADFG 2022a. Alaska Department of Fish and Game – Enforcement http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main

ADFG 2022b. Alaska Department of Fish and Game – Commercial Fish Reporting ADFG 2022a. https://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.elandings

ADFG 2022c Commercial Groundfish Fisheries Regulations https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf

ADFG 2022d. "Submit written comments" http://www.adfg.alaska.gov/index.cfm?adfg=process.comments

ADFG 2022e. Planning process http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions

ADFG 2022f. Our Structure & Staff http://www.adfg.alaska.gov/index.cfm?adfg=about.structure

ADFG 2022f, Alaska Board of Fisheries http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main

ADFG 2022g Advisory Committees https://www.adfg.alaska.gov/index.cfm?adfg=process.advisory

ADFG 2022h Alaska Bycatch Review Task Force (ABRT) Overview. https://www.adfg.alaska.gov/index.cfm?adfg=bycatchtaskforce.main

ADFG 2022i Bycatch Overview in State Managed fisheries – PowerPoint presentation https://www.adfg.alaska.gov/static/fishing/PDFs/bycatchtaskforce/bycatch_overview_state_fisheries.pdf

Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas ("Compliance Agreement") on the 19 December 1995 https://treaties.un.org/pages/showDetails.aspx?objid=080000028007be1a

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

Alaska Department of Revenue – Tax Division. http://www.tax.alaska.gov/programs/programs/index.aspx?60620

Alaska Fisheries Regulations https://www.fisheries.noaa.gov/alaska/rules-and-regulations/regulations-acts-treaties-and-agreements-federal-fisheries-alaska

Alaska License Limitation Program (LLP) https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/license-limitation-program-alaska

Alaska Marine Safety Education Association (AMSEA) https://www.nationalfisherman.com/suppliers/alaska-marine-safety-education-assn

Alaska State Budget Cycle http://akleg.gov/docs/pdf/budgproc.pdf

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

Alaska Statute 16.05.251 http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section251.htm

Alaska Statutes 16.05.690 – Record of Purchases

Alaska Statute 16.05.723 – Misdemeanor commercial fishing penalties https://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723

Alaska Statute 5 AAC 28.263 Guiding principles for groundfish fishery regulations http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm

Alaska Young Fishermen's Summit https://alaskaseagrant.org/events/alaska-young-fishermens-summit/

Agreement between the US and Canada on enforcement. https://www.fisheries.noaa.gov/topic/international-affairs

Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas ("Compliance Agreement") on the 19 December 1995 https://treaties.un.org/pages/showDetails.aspx?objid=080000028007be1a

Amendment 49 Improved Retention/Improved Utilization (IRIU) Program https://www.fisheries.noaa.gov/action/amendment-49-fmp-groundfish-bering-sea-and-aleutian-islands-management-area

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

American Fisheries Act (AFA) 1998 https://alaskafisheries.noaa.gov/fisheries/AFA-pollock

Annual Management Report for Groundfish Fisheries in the Kodiak, Chignik, and South Alaska Peninsula Management Areas. https://www.adfg.alaska.gov/FedAidPDFs/FMR20-26.pdf

Annual Management Report for Groundfish Fisheries in the Prince William Sound https://www.adfg.alaska.gov/FedAidPDFs/FMR21-18.pdf

Aydin, K., Gaichas, S., Ortiz, I., Kinzey, D., and Friday, N. 2007. A comparison of the Bering Sea, Gulf of Alaska, and Aleutian Islands large marine ecosystems through food web modeling. US Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-178. 298 pp.

Barbeaux, S., Ferriss, B., Laurel, B., Litzow, L., McDermott S., Nielsen, J., Palsson, W., Shotwell, K., Spies, and Muyin Wang 2021. Assessment of the Pacific cod stock in the Gulf of Alaska. Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 7600 Sand Point Way NE., Seattle, WA 98115-6349, November 2021. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/GOApcod.pdf.

Biological opinions issued in the Alaska region https://www.fisheries.noaa.gov/alaska/consultations/section-7-biological-opinions-issued-alaska-region

Birdlife 2022 Northern Fulmar http://datazone.birdlife.org/species/factsheet/northern-fulmar-fulmarus-glacialis

Bryan, D., Mcdermott, S., Nielsen, J., Fraser, D., and Rand, K. 2021. Seasonal migratory patterns of Pacific cod (Gadus macrocephalus) in the Aleutian Islands. Animal Biotelemetry. 9. 10.1186/s40317-021-00250-2.

Cahalan, J., J. Gasper, and J. Mondragon. 2014. Catch sampling and estimation in the federal groundfish fisheries off Alaska, 2015 edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-286, 46 p.

Coastal Zone Management Act 1972 https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86- Pg1280.pdf

Code of Federal Regulations 50 CFR 600.740 – Enforcement Policy https://www.law.cornell.edu/cfr/text/50/600.740

Code of Federal Regulations 50 CFR 679, Fisheries of the EEZ off Alaska. https://www.ecfr.gov/current/title-50/chapter-VI/part-679

Code of Federal Regulations. 2001. https://www.govinfo.gov/content/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml.

Code of Federal Regulations. 2012. https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol2/xml/CFR-2012-title33-vol2-part155.xml.

Commercial Groundfish Fisheries Regulations (2020-2021), https://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2020_2021_cf_groundfish_regs.pdf

Delean, B. J., V. T. Helker, M. M. Muto, K. Savage, S. Teerlink, L. A. Jemison, K. Wilkinson, J. Jannot, and N. C. Young. 2020. Human-caused mortality and injury of NMFS-managed Alaska marine mammal stocks, 2013-2017. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-401, 86 p https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjLn-7q3a35AhUrkYkEHXyyCZsQFnoECAsQAQ&url=https%3A%2F%2Frepository.library.noaa.gov%2Fview%2Fnoaa%2F22920%2Fnoaa_22920_DS1.pdf&usg=AOvVaw3K_JM261qqgOhwq-__nXgk

Dorn, M. W., C. J. Cunningham, M. T. Dalton, B. S. Fadely, B. L. Gerke, A. B. Hollowed, K. K. Holsman, J. H. Moss, O. A. Ormseth, W. A. Palsson, P. A. Ressler, L. A. Rogers, M. A. Sigler, P. J. Stabeno, and M. Szymkowiak. 2018. A climate science regional action plan for the Gulf of Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-376, 58 p.

Dragoo, D.E., H.M. Renner, and R.S.A. Kaler. 2019. Breeding status and population trends of seabirds in Alaska, 2018. U.S. Fish and Wildlife Service Report AMNWR 2019/03. Homer, Alaska.

Economic value of Alaska's seafood industry – ASMI Report: https://www.alaskaseafood.org/wp-content/uploads/MRG_ASMI-Economic-Impacts-Report_final.pdf

Economic Status Report for the Gulf of Alaska and Bering Sea/Aleutian Islands 2020 (SAFE Report): https://www.fisheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-bering-sea-aleutian-islands

Endangered Species Act 1973 (As Amended) https://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf

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

Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Provisions in Alaska Fisheries – Federal Register Rules and Notices https://www.fisheries.noaa.gov/action/essential-fish-habitat-efh-and-habitat-areas-particular-concern-hapc-provisions-alaska

Faunce, C., J. Sullivan, S. Barbeaux, J. Cahalan, J. Gasper, S. Lowe, and R. Webster. 2017. Deployment performance review of the 2016 North Pacific Groundfish and Halibut Observer Program. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-358, 75 p.

Federal Regulations for Fisheries of the EEZ of Alaska [50 CFR Part 679] https://www.law.cornell.edu/cfr/text/50/part-679

Ferriss, B.E. and Zador, S. 2021. Ecosystem Status Report 2021: Gulf of Alaska, Stock Assessment and Fishery Evaluation Report, North Pacific Fishery Management Council, 1007 West Third, Suite 400, Anchorage, Alaska 99501.

Fissel, B., M. Dalton, R. Felthoven, B. Garber-Yonts, A. Haynie, A. Himes-Cornell, S. Kasperski, J. Lee, D. Lew, A. Santos, C. Seung, K. Sparks. 2020. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, 2015. NMFS, NOAA, 7600 Sand Point Way N.E. Seattle, Washington 98115-6349. xxiv + 284 p. This report will be available at: https://www.sheries.noaa.gov/alaska/ecosystems/economic-status-reports-gulf-alaska-and-beringsea-aleutian-islands.

Fissel, B., M. Dalton, B. Garber-Yonts, A. Haynie, S. Kasperski, J. Lee, D. Lew, C. Seung, K. Sparks, M. Szymkowiak, and S. Wise. 2021. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Islands Area: Economic Status of the Groundfish Fisheries off Alaska, 2020. NMFS, Seattle, WA. https://apps-afsc.fisheries.noaa.gov/refm/docs/2020/econGroundfishSafe.pdf.

FMP Amendments https://www.fisheries.noaa.gov/search?oq=fmp+amendments

Gauvin, J., Concepicion, B., and Olicver, C. 2019. Final Report on the 2018-2019 Halibut Deck Sorting EFP. https://media.fisheries.noaa.gov/dam-migration/efp-halibut2018-01-final-rpt.pdf

Global Trust, 2011

Goodman, D., Mangel, M., Parkes, G., Quinn, T., Restrepo, V., Smith, T., and Stokes, K. 2002. Scientific Review of the Harvest Strategy Currently Used in the BSAI and GOA Groundfish Fisheries Management Plans. http://www.alaskafisheries.noaa.gov/npfmc/misc_pub/f40review1102.pdf, 138 pp.

Holsman, K. K., Jim Ianelli, Kerim Aydin, Grant Adams, Kelly Kearney, Kalei Shotwell, Grant Thompson, and Ingrid Spies 2021. Climate-enhanced multi-species Stock Assessment for walleye pollock, Pacific cod, and arrowtooth flounder in the South Eastern Bering Sea. Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 7600 Sand Point Way N.E., Seattle, Washington 98115. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSmultispp.pdf.

Kimura, D.K., J.W. Balsiger, and D.H. Ito. 1984. Generalized stock reduction analysis. Canadian Journal of Fisheries and Aquatic Sciences 41(9):1325-1333.

Kodiak Seafood and Marine Science Center. 2018. Annual report FY2018 (July 1, 2017–June 30, 2018). 2018. Kodiak Seafood and Marine Science Center, University of Alaska Fairbanks, College of Fisheries and Ocean, Kodiak. https://www.uaf.edu/files/cfos/Locations/kodiak/annual-report-FY18-KSMSC.pdf

Krieger, J.R. and Eich, A.M. 2021. Seabird Bycatch Estimates for Alaska Groundfish Fisheries: 2020. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-F/AKR-25, 40 p. 10.25923/a0fb-nt02.

Laurel, B., M. Spencer, P. Iseri, and L. Copeman. 2016. Temperature-dependent growth and behavior of juvenile Arctic cod (*Boreogadus saida*) and co-occurring North Pacific gadids. Polar Biology 39:1127-1135.

Magnuson Stevens Act (MSA) 2007 (as amended) https://media.fisheries.noaa.gov/dam-migration/msa-amended-2007.pdf

Marine Mammal Protection: Conservation and Management https://www.fisheries.noaa.gov/topic/marine-mammal-protection/conservation-&-management

Maritime (SAFE) Act 2019 https://media.fisheries.noaa.gov/dam-migration/maritime_safe_act-508compliant.pdf

Methot, R. D. 1986. Synthetic estimates of historical abundance and mortality for northern anchovy, Engraulis mordax. NMFS, Southwest Fish. Cent., Admin. Rep. LJ 86-29, La Jolla, CA.

Methot, R. D. 1990. Synthesis model: An adaptable framework for analysis of diverse stock assessment data. Int. N. Pac. Fish. Comm. Bull. 50:259-277.

Methot, R. D. 2005. Technical description of the Stock Synthesis II Assessment Program. Unpubl. manuscr. National Marine Fisheries Service, Northwest Fisheries Science Center, 2725 Montlake Blvd. East, Seattle, WA 98112- 2097. 54 p.MSA 2007, 15 CFR PART 904 Subpart E https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E

MSA 2007, 50 CFR 600.740 Enforcement policy https://www.law.cornell.edu/cfr/text/50/600.740

MSA 2007 Section 304(d) of the MSA - Community Development Quota (CDQ) Program https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.pdf

NEPA 2005. Fishery Management Guidance for NEPA Reviews https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews

National Standards - US Federal Register at 50 CFR Part 600 subpart D https://www.law.cornell.edu/cfr/text/50/part-600/subpart-D

Neidetcher, S. K., Hurst, T. P., Ciannelli, L., Logerwell, E. A. 2014. Spawning phenology and geography of Aleutian Islands and eastern Bering Sea Pacific cod (Gadus macrocephalus). DeepSea Research II: Topical Studies in Oceanography 109:204-214.

Nettleton, J. 2009. Are fish and plant omega-3s the same? ASMI. Juneau, AK. https://www.ncbi.nlm.nih.gov/pubmed/1825498.

Nichols, N. W., P. Converse, and K. Phillips. 2015. Annual management report for groundfish fisheries in the Kodiak, Chignik, and South Alaska Peninsula Management Areas, 2014. Alaska Department of Fish and Game, Fishery Management Report No. 15-41, Anchorage.

NMFS. 2010. Endangered Species Act Section 7 Consultation Biological Opinion: Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Bering Sea And Aleutian Islands Management Area, Authorization of Groundfish Fisheries under the Fishery Management Plan for Groundfish of the Gulf of Alaska, State of Alaska Parallel Groundfish Fisheries. https://www.fisheries.noaa.gov/resource/document/endangered-species-act-section-7-consultation-biological-opinion-alaska.

NMFS. 2015. Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS). https://www.fisheries.noaa.gov/action/alaska-groundfish-programmatic-supplemental-environmental-impact-statement-pseis.

NMFS. 2016. Final Marine Mammal Protection Act Section 101(a)(5)(E) – Negligible Impact Determination. https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0.

NMFS. 2021. Fisheries Catch Reports National Marine Fisheries Service, 709 West 9th Street. Juneau, Alaska 99802. https://alaskafisheries.noaa.gov/fisheries-catch-landings.NOAA Alaska Regional Office https://www.fisheries.noaa.gov/contact/alaska-regional-office

NOAA Cost Recovery Fee Program – Alaska region. https://www.fisheries.noaa.gov/alaska/commercial-fishing/cost-recovery-programs-fee-collection-and-fee-payment-alaska

NOAA 2015. Impact of “ghost fishing” via derelict gear https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf

NOAA 2021, Annual Community Engagement and Participation Overview (ACEPO) https://meetings.npfmc.org/CommentReview/DownloadFile?p=b26ba0fd-2447-41b2-8de5-6a1a4c488471.pdf&fileName=D8%20ACEPO%20ESSR.pdf

NOAA 2022a Bering Sea and Aleutian Islands (BSAI) Halibut Abundance – Based Management https://www.fisheries.noaa.gov/alaska/bycatch/bering-sea-and-aleutian-islands-bsai-halibut-abundance-based-management

NOAA 2022b Biological opinions issued in the Alaska region https://www.fisheries.noaa.gov/alaska/consultations/section-7-biological-opinions-issued-alaska-region

NOAA 2022c. Agreement between the US and Canada on enforcement. https://www.fisheries.noaa.gov/topic/international-affairs
NOAA 2022d Bycatch and prohibited species catch in groundfish fisheries in Alaska https://www.fisheries.noaa.gov/alaska/bycatch/bycatch-and-prohibited-species-catch-groundfish-and-shellfish-fisheries-alaska
NOAA 2022e Regulations on seabird avoidance https://www.fisheries.noaa.gov/alaska/bycatch/alaska-regulations-seabird-avoidance-and-listed-seabirds
NOAA 2022f Maximum Retainable Amount (MRA) in Alaska Fisheries https://www.fisheries.noaa.gov/action/maximum-retainable-amount-mra-alaska-fisheries-federal-register-rules-and-notices
NOAA 2022g. Alaska Fisheries Impacts from Covid-19 https://media.fisheries.noaa.gov/2021-02/Alaska-COVID-19-Impact-Snapshot-webready.pdf.
NOAA 2022h Electronic Monitoring in Alaska https://www.fisheries.noaa.gov/alaska/resources-fishing/electronic-monitoring-alaska
NOAA 2022i Report to Congress of the Maritime Security and Fisheries Enforcement Act interagency Working Group on IUU Fishing Regarding Efforts to Investigate, Enforce and Prosecute IUU in 2020. https://media.fisheries.noaa.gov/2021-08/SAFEACTReport_Enforcement.pdf
NOAA. 2022j. Enforcement Efforts to Combat illegal, Unreported and Unregulated Fishing. https://www.fisheries.noaa.gov/enforcement-efforts-combat-illegal-unreported-and-unregulated-fishing.
NOAA Fisheries. 2012. Resource Ecology and Ecosystem Modeling Program: Forage Euphausiids Abundance in Space and Time (FEAST). https://www.afsc.noaa.gov/Quarterly/amj2012/divrptsREFM3.htm.
NOAA Fisheries. 2016. Final Marine Mammal Protection Act Section 101(a)(5)(E) – Negligible Impact Determination. https://www.fisheries.noaa.gov/resource/document/final-marine-mammal-protection-act-section-101a5e-negligible-impact-0.
NOAA Fisheries. 2017. Essential Fish Habitat 5-Year Review Summary Report 2010 through 2015. https://www.fisheries.noaa.gov/resource/document/essential-fish-habitat-5-year-review-summary-report-2010-through-2015.
NOAA Fisheries. 2021. 2020 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Coded Wire Tag and Recovery Data for Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2021-10/ak-groundfish-fishery-salmon-bycatch-2020-annual-rpt.pdf.
NOAA Fisheries. 2022a. 2021 North Pacific Groundfish Stock Assessments. https://www.fisheries.noaa.gov/alaska/population-assessments/2021-north-pacific-groundfish-stock-assessments.
NOAA Fisheries. 2022b. 2021 Annual Report for the Alaska Groundfish Fisheries Chinook Salmon Incidental Catch and Endangered Species Act Consultation. https://media.fisheries.noaa.gov/2022-02/2021-chinook-incidental-catch-esa-annual-rpt.pdf.
NOAA Fisheries. 2022c. Steller Sea Lion Protection Measures. https://www.fisheries.noaa.gov/alaska/commercial-fishing/steller-sea-lion-protection-measures.
NOAA Fisheries. 2022d. Steller Sea Lion. https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management.
NOAA Fisheries. 2022e. Essential Fish Habitat (EFH) in Alaska. https://www.fisheries.noaa.gov/alaska/habitat-conservation/essential-fish-habitat-efh-alaska.
NOAA Fisheries. 2022f. Essential Fish Habitat 5-Year Review. https://www.fisheries.noaa.gov/action/essential-fish-habitat-5-year-review.
NOAA Fisheries. 2022g. Alaska Groundfish Harvest Specifications. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/alaska-groundfish-harvest-specifications.
NOAA Fisheries. 2022h. https://www.integratedecosystemassessment.noaa.gov/regions/alaska/alaska-eastern-bering-sea-integrated-ecosystem-assessment-modeling.
NOAA Fisheries. 2022i. Bering Sea and Aleutian Islands Amendment 80 Groundfish Trawl Fishery in Alaska. https://www.fisheries.noaa.gov/alaska/sustainable-fisheries/bering-sea-and-aleutian-islands-amendment-80-groundfish-trawl-fishery.
NOAA Fisheries. 2022j. Alaska Fisheries Science Center Strategic Plan FY2023-FY2027. https://www.fisheries.noaa.gov/resource/document/alaska-fisheries-science-center-strategic-plan-fy2023-fy2027.
NOAA Office of General Counsel – Penalty Policy and Schedule https://www.gc.noaa.gov/enforce-office3.html
North Pacific Marine Science Organization, 2021. Annual Report 2021. PICES 2021 Virtual Annual Meeting. https://meetings.pices.int/publications/annual-reports/2021.
NPFMC. 2007. Aleutian Islands Fishery Ecosystem Plan. https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/AIFEP/AIFEP12_07.pdf.
NPFMC 2017. Navigating North Pacific Fishery Management Council Meetings: A Guide for the Young Fishermen's Summit. https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf
NPFMC. 2018a. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area. https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf.
NPFMC. 2018b. Fishery Management Plan for Groundfish of the Gulf of Alaska. https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf.
NPFMC 2018c Community Engagement Committee, Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/CEC/CEC_TOR_1218.pdf
NPFMC 2019a, BSAI Pacific cod Allocation Review https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/Pcod/BSAIPcodAllocationReview2019.pdf

NPFMC 2019b, Statement of Organization, Practices and Procedures https://www.npfmc.org/wp-content/PDFdocuments/membership/Council/NPFMC_SOPP_October2019.pdf
NPFMC. 2019c. Bering Sea Fishery Ecosystem Plan. https://meetings.npfmc.org/CommentReview/DownloadFile?p=c334ad33-4139-4b5a-b205-a8b7c5028562.pdf&fileName=D6%20Final%20BS%20FEP%20Jan%202019.pdf.
NPFMC 2020a, Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
NPFMC 2020b, Fishery Management Plan for Groundfish of the Gulf of Alaska https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
NPFMC 2022a Enforcement Committee Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf
NPFMC 2022b "How do I get involved" https://www.npfmc.org/how-do-i-get-involved/
NPFMC 2022c Chinook salmon bycatch management in Alaska https://www.fisheries.noaa.gov/alaska/bycatch/chinook-salmon-bycatch-management-alaska
NPFMC 2022d Groundfish bycatch management https://www.npfmc.org/fisheries-issues/bycatch/groundfish-bycatch/
NPFMC. 2022e. BSAI Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/bsai-groundfish-fisheries/.
NPFMC. 2022f. GOA Groundfish Fisheries. https://www.npfmc.org/fisheries-issues/fisheries/goa-groundfish-fisheries/.
NPFMC. 2022g. Habitat Protections. https://www.npfmc.org/fisheries-issues/issues/habitat-protections/.
NPFMC. 2022h. Management Policies. https://www.npfmc.org/how-we-work/management-policies/.
NPFMC. 2022i. Salmon Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/salmon-bycatch/.
NPFMC. 2022j. Crab Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/crab-bycatch/.
NPFMC. 2022k. Halibut Bycatch. https://www.npfmc.org/fisheries-issues/bycatch/halibut-bycatch/.
Northern fur seal: Conservation and Management https://www.fisheries.noaa.gov/species/northern-fur-seal#conservation-management
OLE 2021a, Office of law Enforcement Annual Report Fiscal Year 2019 https://www.fisheries.noaa.gov/resource/document/office-law-enforcement-annual-report-fiscal-year-2019
OLE 2021b Office of Law Enforcement Alaska Enforcement Division December Report To North Pacific Fisheries Management Council. October 2020 to September 2021 https://meetings.npfmc.org/CommentReview/DownloadFile?p=188b9834-6bd4-4281-b950-37581d7f6580.pdf&fileName=B4%202021%20December%20OLE%20Report.pdf
OLE. 2021c. OLE Enforcement Report to Council. https://meetings.npfmc.org/CommentReview/DownloadFile?p=ca983f30-9a78-405e-9bf8-a4d552853f15.pdf&fileName=B4%20OLE%20Report.pdf.
Ormseth, O.A. 2021. 18. Partial assessment of the skate stock complex in the Bering Sea and Aleutian Islands. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/BSAIskate.pdf.
Ortiz, I. and S. Zador (eds.). 2021. Ecosystem Status Report 2021: Aleutian Islands.
Pacific Salmon Treaty http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/
PSEIS 2015, Programmatic Supplemental Environmental Impact Statement Information Report 2015. https://www.fisheries.noaa.gov/resource/document/alaska-groundfish-fisheries-programmatic-supplemental-environmental-impact
Rose, G.A. and Kulka, D.W., 1999. Hyperaggregation of fish and fisheries: how catch-per-unit-effort increased as the northern cod (Gadus morhua) declined. Canadian Journal of Fisheries and Aquatic Sciences, 56(S1), pp.118-127.
Shimada A. M., Kimura D.K., 1994. Seasonal movements of Pacific cod (*Gadus macrocephalus*), in the eastern Bering Sea and adjacent waters based on tag-recapture data. Fishery Bulletin 92(4) 1994. https://spo.nmfs.noaa.gov/sites/default/files/pdf-content/1994/924/shimada.pdf
Shotwell., S.K., S. Barbeaux, B. Ferriss, B. Fissel, B. Laurel, B. Matta, and L. Rogers. 2021. Appendix 2.1. Ecosystem and Socioeconomic Profile of the Pacific cod stock in the Gulf of Alaska. In Chapter 2: Assessment of the Pacific cod stock in the Gulf of Alaska. NPFMC Gulf of Alaska SAFE. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/GOApcod.pdf.
Siddon, E. (ed.). 2021. Ecosystem Status Report 2021: Eastern Bering Sea. https://apps-afsc.fisheries.noaa.gov/refm/docs/2021/EBSecosys.pdf.
Sigler, M., A. Hollowed, K. Holsman, S. Zador, A. Haynie, A. Himes-Cornell, P. Mundy, S. Davis, J. Duffy-Anderson, T. Gelatt, B. Gerke, and P. Stabeno. 2016. Alaska Regional Action Plan for the Southeastern Bering Sea: NOAA Fisheries Climate Science Strategy. https://repository.library.noaa.gov/view/noaa/12964.
Spies, I., 2012. Landscape Genetics Reveals Population Subdivision in Bering Sea and Aleutian Islands Pacific Cod. Transactions of the American Society. Volume 141, Issue 6. https://www.tandfonline.com/doi/abs/10.1080/00028487.2012.711265
Spies, I., Barbeaux, S., Ianelli, J.N., Ortiz, I., Palsson, W., Rand, K. and Thompson G.G. 2021, Assessment of the Pacific cod stock in the Aleutian Islands. Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 7600 Sand Point Way NE., Seattle, WA 98115-6349, November 2021. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/AIpcod.pdf.
Stark, J. W. 2007. Geographic and seasonal variations in maturation and growth of female Pacific cod (Gadus macrocephalus) in the Gulf of Alaska and Bering Sea. Fish. Bull. 105:396-407.
Steller sea lion: Conservation and Management https://www.fisheries.noaa.gov/species/steller-sea-lion#conservation-management

Thompson, G. G., and W. A. Palsson. 2016. Assessment of the Pacific cod stock in the Aleutian Islands. In Plan Team for Groundfish Fisheries of the Bering Sea/Aleutian Islands (compiler), Stock assessment and f ishery evaluation report for the groundfish resources of the Bering Sea/Aleutian Islands regions, p. 545-638. North Pacific Fishery Management Council, 605 W. 4th Avenue Suite 306, Anchorage, AK 99501.

Thompson, G.G., Barbeaux, S., Conner, J., Fissel, B., Hurst, T., Laurel, B., O'Leary, C.A., Rogers, L., Kalei Shotwell, S., Siddon, E., Spies, I. Thorson, J.T. and Tyrell A. 2021. Assessment of the Pacific Cod Stock in the Eastern Bering Sea. Alaska Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 7600 Sand Point Way NE., Seattle, WA 98115-6349, November 2021. https://apps-afsc.fisheries.noaa.gov/Plan_Team/2021/EBSpcod.pdf.

US Federal Register at 50 CFR Part 600 subpart D https://www.law.cornell.edu/cfr/text/50/part-600/subpart-D

USCG 2021. 17th Coast Guard District Enforcement report to NPFMC: October – November 2021 https://meetings.npfmc.org/CommentReview/DownloadFile?p=43d5d53b-a720-4d32-a660-3ecbe06b19db.pdf&fileName=B6%20USGC%20Report.pdf

USCG 2022. Illegal, Unreported and Unregulated Fishing https://www.uscg.mil/iuufishing/

USFWS. 2015. Biological Opinion for the Effects of the Fishery Management Plans for the Gulf of Alaska and Bering Sea/Aleutian Islands Groundfish Fisheries and the State of Alaska Parallel Groundfish Fisheries, December 2015. 49 pp. Available at https://meetings.npfmc.org/CommentReview/DownloadFile?p=bb553db6-1eba-47e7-bb1d-415c27b81327.pdf&fileName=B7%20BiOp%20Effects%20Grndfish%20FMPsState%20Parallel%20Fisheries.pdf.

Watson, L.J. Pengilly, D., Jackson, D.R. 1998. Effects of modifications to cod-fishing pots on catch rates of Pacific cod. ADFG. Regional information report No. 4K98-45.

APPENDICES

Appendix 1 Stakeholder submissions

No stakeholder comments were received during announced consultation opportunities for the reassessment site visit or during the draft report's public comment period.

Appendix 2 Peer Reviews

The peer reviewers were Wes Toller and Jim Andrews. The unattributed peer reviewer comments and team responses are provided below.

Peer Reviewer 1

General comments:

Comment	CB response
Overall the decision to re-certify this fishery against the RFM standard is justified. The team has set out a generally well justified report.	Thank you. No response needed.
There are some areas that require attention that are addressed in the specific comments below. I would highlight that the following points require careful consideration:- 1. **Management units / stocks**– the report is confused with respect to stock management in the BSAI area. The opening section of the report. The rationale for EP1.2 states that:- *"The resource in the EBS and AI (BSAI) region had been managed as a single unit from 1977 through 2013, however, research indicating the existence of discrete stocks in the EBS and AI (Spies 2012) separate harvest specifications have been set for the two areas since the 2014 season."* Looking at §3.2.3.4.3 of the BSAI FMP (Apportionment of Total Allowable Catch), there is no spatial allocation between the two subareas for Pacific cod (but there is for other species, such as sablefish). This FMP is dated November 2020. Throughout the scoring of Fundamental Clause A the report refers to BSAI as an aggregate stock. It is hard to reconcile this with the information presented elsewhere which shows that they should be, and in fact are, managed independently. Overall, the assessment and the FMP are muddled in this regard and some clarity is urgently needed. 2. **Transparency (SC1.8)** – given the rationale presented for SC3.1, the team really need to consider if the management arrangements and decision-making processes are organised in a transparent manner. It is a matter of fact (reported in SC3.1) that the decision by the BOF to repeal the guiding principles for groundfish management plans was not apparent to the CAB until 9 years AFTER their repeal. The fishery was RFM certified at that time, and during the intervening period it has been subject to annual surveillance audits and a re-assessment. If we can assume that the CAB has been carrying out its audits thoroughly, the only explanation for this must be a major lack of transparency. I feel that this needs to be addressed.	1. **Management units / stock**. Thank you. Additional text has been provided at section 3.1.2.3 explaining the management units and how the allocations are distributed. 2. **Transparency –** Thank you. Some background information has been provided in relation to SC 1.8 and SC 3.1, which provides some context to how this was overlooked in previous audits and assessments. 3. **Seabirds –** Thank you. Additional text has been added to better describe and rationalize the impact of the longline fishery on seabirds within rationales as appropriate.

3. **Seabirds** –the report identifies the Pacific cod longline fishery as having a very high seabird bycatch. This issue does not get the attention it deserves – the team appear to be satisfied that the low level of interaction with ETP birds species meets all of the relevant requirements. I am not sure that this is appropriate, and for several SCs I have asked the team to consider the impact of the fishery on seabirds.	

Specific comments

Section/Clause	Comment	CB response
1 Summary	No comments.	Thank you. No response needed.
2 Assessment team and peer reviewer details	No comments.	Thank you. No response needed.
3 Background	Good information, a bit hard to "navigate" around the information for each management area (EBS / AI / GOA etc). It would be helpful if there was a fourth hierarchy of headings (i.e. "3.1.2.1 EBS"; "3.1.2.2 GOA" etc); similar comment for figure and table legends (i.e. modify the legend for "Table 12 Summary of the assessment results" and add the words "for **EBS Pacific cod"**). This will not be necessary for all cases (e.g. Figure 6). GOA: the narrative text and tables for this stock don't correspond very well to one another. The opening text states that "*The estimate of the 2021 SSB is 39,873 t, well below the B40% (surrogate for BMSY) estimate of 72,045 t. Moreover, the 2021 assessment projection of the 2022 SSB is comprised between 35,050 t and 38,594t, depending on the projection assumed (see following text, providing no evidence of retrospective bias in the assessment. The SBB estimate is above B20 (32,485 t), with lower confidence limit close or below this level (again depending on the projection).*" This text agreed with the content of Tables 16 & 17. However the legend for Figure 10 and the figure itself are not consistent with the opening paragraph, nor Tables 16 & 17, nor with Figure 11. §3.8 provides a list of catch date for the BSAI and GOA fisheries (Tables 18 and 19 respectively). Both tables require further explanation – for several non-target species the data are reputedly for a number of individuals (e.g. Auklets); however the numbers are not whole (there were 35.85 Auklets caught in 2017). Unless the "0.85" denotes a very small auklet, it would seem that what we actually have here are data from observer records on an	Thank you for the comment. Fourth level headings have been added. The GOA tables and figures in section 3.3.1.3 have been corrected. The team was informed that non-whole numbers were a result of how observer data were collected and used to estimate catches. However, the numbers for seabirds and relevant fish/crab species have been changed to whole numbers to limit confusion. Unfortunately, bycatch data by gear type is not readily available. However, the text has been revised to highlight that longline gear has high seabird bycatch. Also, when available, gear-specific catch data have been noted.

	unspecified proportion of fishing trips that have been raised to the fleet / year level. Another issue in these two tables is that they seem to aggregate catches from all métiers. Given that the Pacific cod longline is know for its high seabird catch, this may either mask or inflate the impact of this métier overall. To properly understand the impact of the fishery on the marine environment it would be very helpful to see data here presented métier-by-métier if at all possible, and at the very least to give some idea of the level of observer coverage that resulted in these data. §3.9 States that "Recent conditions have been an unusually warm phase…" including Figure 14 as evidence of this. The map in the figure dates from a NOAA publication in 2014. Hardly "recent". The trend has continued and is now more significant (see https://www.fisheries.noaa.gov/feature-story/central-gulf-alaska-marine-heatwave-watch) and this section should be updated. The COVID-19 pandemic has been the biggest challenge for all aspects of fishery management (monitoring, data gathering, stock assessment, management) for a generation. There is no mention of how this has affected management until the rationale for supporting clause 4.2. It would also be appropriate to mention COVID-19 and its impacts in the narrative text as well.	Since gear-specific bycatch data are not available (except for seabirds and marine mammals), Clause 4.2 has been cross referenced in Section 3.8 to highlight additional details of the observer program and coverage. Text was updated to reflect past warming and more recent (2020-2021) temperatures. As far as we discussed during the site visits, COVID-19 did not affect the science and stock assessment activities or the precautionary approach. A sentence has been added to better clarify this point.
4 Assessment process	The team has responded appropriately to Covid-19 restrictions by interviewing a wide range of stakeholders remotely.	Thank you. No response needed.
5 Assessment outcome	TBC	NA
Key Component A: The Fisheries Management System		
1.1	It is clear from the rationale that there is an appropriate and well organised legal and administrative framework in place that the national, State and local levels. However what is not clear here and throughout this key component is whether (or how) the NPFMC Groundfish FMP for the BSAI differentiates the two stocks (EBS and AI) within this area. These are described in §3.3. of the report. It is stated that, according to Table 13, are managed independently and have been since 2014. The rationale for EP1.2 states that:- *"The resource in the EBS and AI (BSAI) region had been managed as a single unit from 1977 through 2013, however, research indicating the existence of discrete stocks in the EBS and AI (Spies 2012)*	Thank you. Additional explanatory text and has been provided in section 3.1.2.3, which more clearly describes the management measures and allocation of Pacific cod in the BSAI. This is referenced in SC 1.1.

	separate harvest specifications have been set for the two areas since the 2014 season." Looking at §3.2.3.4.3 of the BSAI FMP (Apportionment of Total Allowable Catch), there is no spatial allocation between the two subareas for Pacific cod (but there is for other species, such as sablefish). This FMP is dated November 2020. This requires some explanation – at what point (if at all) does the aggregate TAC determined by the FMP for BSAI take into account the separate EBS and AI stocks and set TACs that are appropriate for them? Explanation is also needed about how the GHLs used by the Alaskan State are determined and whether or not the differentials in these (8% of Pacific cod in one area (presumably EBS) and 27% of ABC for AI) have the effect of compounding or relieving fishing pressure on either stock. I feel that further information is needed here to fully justify a "perfect 10" score.	
1.2	See comments on SC1.1 above – some further or clearer explanation is needed on the "*separate harvest specifications*" that are reported to be in place for the EBS and AI as a response to the research indicating that they were discrete stocks back in 2012. I can't see any sign of this in the most recent FMP, but I am perhaps looking in the wrong place. Further information on this point is needed to justify the score awarded.	Thank you. Additional explanatory text and has been provided in section 3.1.2.3, which more clearly describes the management measures and allocation of Pacific cod in the BSAI. This is reference in SC 1.2.
1.2.1	The scoring is appropriate	Thank you. No response needed.
1.3	Based on the information presented in the report I agree that this is not a transboundary / straddling / highly migratory or High Seas stock and that this parameter does not need to be scored.	Thank you. No response needed.
1.3.1	Based on the information presented in the report I agree that this is not a transboundary / straddling / highly migratory or High Seas stock and that this parameter does not need to be scored.	Thank you. No response needed.
1.4	Based on the information presented in the report I agree that this is not a transboundary / straddling / highly migratory or High Seas stock and that this parameter does not need to be scored.	Thank you. No response needed.
1.4.1	Based on the information presented in the report I agree that this is not a transboundary / straddling / highly migratory or High Seas stock and that this parameter does not need to be scored.	Thank you. No response needed.
1.5	Based on the information presented in the report I agree that this is not a transboundary / straddling /	Thank you. No response needed.

	highly migratory or High Seas stock and that this parameter does not need to be scored.	
1.6	The scoring is well evidenced and appropriate.	Thank you. No response needed.
1.6.1	I agree that in the absence of international agreements relating to this stock it is not appropriate to score this parameter.	Thank you. No response needed.
1.7	The rationale provided a detailed and comprehensive summary of how the fishery management system is kept under review, and the scoring is appropriate.	Thank you. No response needed.
1.8	See the earlier comments (1.1. & 1.2 above) about the apparent lack of clarity about how the TAC is set for the separate EBS and AI stocks. I note with concern that the team has not make the link between the fact that it took 9 years for it to become apparent that the guiding principles in the BOF had been repealed in 2013 (see EP 3.1 and the corresponding non-conformity). The fact that there had been annual surveillance audits in the intervening period and also a re-assessment of the fishery in 2017 suggest that in actual fact the decision making processes are NOT organised in a transparent manner (if they were, then this change would have been detected much sooner). The rationale presented is deficient in these two key areas (i.e. how the aggregate TAC is divided into sub-Areas; and the omission of the changes to the guiding principles). A score of 10 is not fully justified, and a lower score would be more appropriate.	Thank you. Additional text with respect to the international aspects of the management system have been added. With respect to the concern about transparency, at the 2017 reassessment, information was provided by the consultant used by the client that showed that the guiding principles had been developed for BOF groundfish management plans. These fulfilled the expectation of the re-assessment team with regard to this SC. However, the reassessment team did recommend that the BOF review the guiding principles and more explicitly state them in the Pacific cod Management Plans. A recommendation is non-binding and so, while this was reviewed at each subsequent audit, no changes were reported. At this reassessment, the same team member who was on the last re-assessment team, sought further clarification from the client group on the status of the management plans and the potential for their review. It was at this point that it came to light that these guiding principles had been repealed in 2013. The reassessment team do not consider this was due to a lack of transparency, rather, an oversight in gathering and provision of information at the last reassessment of the fishery.
1.9	I agree that this is not a High Seas fishery and that this parameter does not need to be scored.	Thank you. No response needed.
Key Component B: Science and Stock Assessment Activities and the Precautionary Approach		
2.1	The description of the legal framework shows how it addresses the first two of the three issues identified in this parameter, but not the third ("*the rights and needs of coastal communities*"). This is (presumably) provided by the Alaska State allocation of a proportion of the overall resource to pot and jig fishermen working in inshore waters; the rationale for SC2.5 about the Community Development Quota is relevant here; and so are the FMP objectives listed for SC3.1. .	Thank you. Additional text has been added to better demonstrate the "rights and needs of coastal communities", in the context of integrated use of coastal resources.

	If this information is provided, a score of 10 would seem appropriate.	
2.1.1	The scoring is appropriate.	Thank you. No response needed.
2.1.2	The scoring is appropriate.	Thank you. No response needed.
2.2	The scoring is appropriate.	Thank you. No response needed.
2.3	The scoring is appropriate.	Thank you. No response needed.
2.4	The scoring is appropriate.	Thank you. No response needed.
2.5	The scoring is appropriate.	Thank you. No response needed.
2.6	The scoring is appropriate.	Thank you. No response needed.
2.7	The scoring is appropriate.	Thank you. No response needed.
3.1	The decision to raise a minor NC in respect of the changes to the BOF is appropriate. The fact that it took 9 years for this change to come to light raises serious questions about the transparency of the management system, which I have mentioned in connection with SC1.8.	Thank you. With respect to the concern about transparency, this has been explained in 1.8 above.
3.1.1	The scoring is appropriate.	Thank you. No response needed.
3.1.2	The scoring is appropriate.	Thank you. No response needed.
3.1.3	The scoring is appropriate.	Thank you. No response needed.
3.2	No SC, no comment.	Thank you. No response needed.
3.2.1	The scoring is appropriate.	Thank you. No response needed.
3.2.2	The scoring is appropriate.	Thank you. No response needed.
3.2.3	The scoring is appropriate.	Thank you. No response needed.
3.2.4	It is a matter of some concern that here and in earlier SC's the cod freezer longline fishery is distinguished as having "…*the highest recorded seabird bycatch of any individual fishery*…". This is presumably not a good thing. However, it is not clear whether this represents a significant impact on the biodiversity of aquatic ecosystems in the area. Looking at Tables 18 & 19, the catch of Northern fulmar in the BSAI surely deserves some comment (annual average of 2,241.1 individuals killed); but the GOA impact on this species is less alarming (37.22 p.a.). A key objective of the BSAI and GOA FMPs that is quoted in the rationale is to: "*Continue to cooperate with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.*" It also states that: "*The US Fish and Wildlife Service compiles data collected for seabirds at breeding colonies*	Additional text regarding the conservation status of northern fulmar has been included, which confirms that an observed average of 2,241 does not pose a conservation risk.

	throughout Alaska to monitor the condition of the marine ecosystem and to evaluate the conservation status of species. The AFSC also produces annual estimates of total seabird bycatch from the groundfish fisheries." No information is presented here or anywhere else in the report to show whether the status of these species is favourable or not; and thus whether cooperation with the USFWS is appropriate or necessary. It is, however, reassuring that interactions with ETP species are well within limits and are thus protected. To fully justify the score of 10 awarded here some additional information about the significance of seabird bycatch in the cod freezer longline fishery is needed.	
4.1	The rationale presents an adequate description of the systems in place for routine monitoring of the fishery. It does not, however, describe how this system was affected by, and responded to, the COVID-19 pandemic. This presumably impacted the collection and analysis of data concerning fishery removals. The score of 10 would be better justified if the rationale was updated to reflect this point.	Thank you for the comment. As far as we discussed during the site visits, COVID-19 did not affect the science and stock assessment activities or the precautionary approach. A sentence has been added to better clarify this point.
4.1.1	The rationale presents an adequate description of the systems in place for routine monitoring of the fishery. It does not, however, describe how this system was affected by, and responded to, the COVID-19 pandemic. This presumably impacted the collection, analysis and distribution of fishery statistics. The score of 10 would be better justified if the rationale was updated to reflect this point.	Thank you for the comment. As far as we discussed during the site visits, COVID-19 did not affect the science and stock assessment activities or the precautionary approach. A sentence has been added to better clarify this point.
4.1.2	The scoring is appropriate.	Thank you. No response needed.
4.2	The rationale contains a qualitative explanation of the response of the observer scheme to the COVID-19 pandemic. It does not, however, quantify the impact of the pandemic on observer coverage (if any) and how the management system has responded to any information shortfall that may have arisen. Further to this, the report provides a qualitative description of the two observer coverage categories (100% coverage or partial coverage). No indication is provided of what is meant by "partial". What proportion of fishing operations are observed in the "partial coverage" category for instance? With the provision of this additional quantitative information, a score of 10 would be better justified.	Thank you for the comment. As far as we discussed during the site visits, COVID-19 did not affect the science and stock assessment activities or the precautionary approach. A sentence has been added to better clarify this point. The partial observer is presented in 4.2: the partial observer coverage category, where NMFS determines when and where observer coverage is needed

4.2.1	This SC is very much focussed on observer programs. It is therefore surprising that no mention is made here of the impact of COVID-19 on the observer programs, particularly with respect to quantitative estimates of catches, discards and incidental catches of marine organisms. To justify the score of 10 awarded here it is necessary to document how the observer programs have been impacted by COVID-19, the mitigation that has been put in place, and the extent to which the accuracy of quantitative estimates of the relevant parameters have been affected.	Thank you for the comment. As far as we discussed during the site visits, COVID-19 did not affect the science and stock assessment activities or the precautionary approach. A sentence has been added to better clarify this point.
4.3	The scoring is appropriate.	Thank you. No response needed.
4.4	The scoring is appropriate.	Thank you. No response needed.
4.5	The scoring is appropriate.	Thank you. No response needed.
4.6	The rationale presented here does not seem to address the issues tested by the SC. It is clear that the bulk of the fishery removals from each stock are taken by modern vessels fishing in areas that traditional fisheries would not have prosecuted; however it is also evident that there is a locally significant inshore fishery (within 3nmi of the shore) where there are smaller scale fisheries using pots and jigs, to which these traditional fisheries would be relevant. To justify the score of 10 that is awarded, the rationale needs to be revise and better aligned with the issues that are being tested by this SC.	Thank you for the comment. The team is of the opinion that the rationale fully covers the parameters in 4.6.
4.7	I agree that this is not relevant.	Thank you. No response needed.
4.8	I agree that this is not relevant.	Thank you. No response needed.
4.9	I agree that this is not relevant.	Thank you. No response needed.
4.10	I agree that this is not relevant.	Thank you. No response needed.
4.11	I agree that this is not relevant.	Thank you. No response needed.
5.1	The scoring is appropriate.	Thank you. No response needed.
5.1.1	I agree that this is not relevant.	Thank you. No response needed.
5.1.2	The scoring is appropriate.	Thank you. No response needed.
5.2	The scoring is appropriate.	Thank you. No response needed.
5.3	The scoring is appropriate.	Thank you. No response needed.
5.4	I agree that this is not relevant.	Thank you. No response needed.
5.5	Although the scoring is appropriate, it would be bolstered by including some specific examples rather than the rather vague statement that	Thank you for the comment. The team is of the opinion that there is no need to repeat the publications here.

	publications from research into the fishery have been "…*documented in some pervious clauses*…". It would be nice to reward the exertions of at least some of the many researchers with a name-check here.	
6.1	Some of the earlier confusion about stock identity and management units is also relevant here (see comments on SC1.1 & 1.2). Very briefly, the reference points described here are for the GOA stock and for a BSAI stock. There is no mention of the EBS and AI stocks as distinct sub-areas within the BSAI that have their own reference points (see Figures 6 & 8 of the report). The rationale presented here is also deaf to the information presented for SC6.2 on the following page, which explains that the EBS and GOA stocks are in Tier 3, whilst AI cod are in Tier 5. This distinction is also relevant to SC6.1 and should be mentioned here. To justify the score awarded the rationale must be revised to consider the EBS and AI reference points.	Thank you for the comment. The confusion about stocks has been clarified. The management is at BSAI and GOA level, while the assessed stocks are 3 (EBS, GOA and AI).
6.2	As noted above, the rational in this instance acknowledges the existence of separate EBS, AI and GOA stocks. It is reported that EBS and GOA cod are in "Tier 3" of the NPFMC system; and that AI cod are in "Tier 5". The rationale provides a detailed consideration of Tier 3 stocks and how their reference points are determined and used. This is good. The rationale is utterly silent about how reference points are determined for Tier 5 stocks. This omission needs to be rectified to justify the score awarded.	Thank you for the comment. The confusion about stocks has been clarified. The management is at BSAI and GOA level, while the assessed stocks are 3 (EBS, GOA and AI).
6.3	The scoring is appropriate.	Thank you. No response needed.
6.4	The rationale has the same problems as for SC6.2, The management actions for Tier 3 stocks are explained in detail (i.e. for GOA and EBS); but there is no information for the Tier 5 AI cod stock. To justify scoring a "perfect 10" this omission needs to be addressed.	Thank you for the comment. The Tier 5 is presented under 6.1.
6.5	In the light of previous comments, can the team please identify the measures that would be introduced for a depleted stock in both Tier 3 and in Tier 5.	Thank you for the comment. The Tier 5 is presented under 6.1.
7.1	The scoring is appropriate.	Thank you. No response needed.
7.1.1	The scoring rationale provides information on the first parts of the SC, but omits the need to demonstrate how the implementation of the PA	Thank you for the comment. The use of TAC <= ABC < OFL shows the PA from a quantitative point of view.

	takes into account of "*…inter alia…the impact of fishing activities (including discards) on non-target and associated or dependent predators, and environmental and socioeconomic conditions.*" The only information about any of these aspects of the SC in the rationale is the news that "*Extensive research….is presented annually.*" This is neither a qualitative nor quantitative demonstration of how the PA applies to them. To justify scoring a "10" for this SC, these omissions needs to be addressed.	The team is the opinion that there is no need to repeat the info in table presented in the background here.
7.1.2	The scoring is appropriate. There may be a typographic error in the rationale – the GOA cod assessment review is reported as happening in 2011, but the only bibliographic entry for this stock is from 2021.	Thank you. The mistake has been removed.
7.2	I agree that this is not relevant.	Thank you. No response needed.
Key Component C: Management, Measures, Implementation, Monitoring, and Control		
8.1	The scoring is appropriate.	Thank you. No response needed.
8.1.1	The scoring is appropriate.	Thank you. No response needed.
8.1.2	Given that the Pacific cod longline fishery is reported elsewhere in the report as having the highest recorded bird bycatch of any individual fishery, the omission of any reference to any measures the have been implemented to reduce seabird bycatch. The rationale presented here focuses only on the target species and prohibited species. The Evaluation Parameters for this SC require that "*The strategy* [to manage bycatch] *to ensure….bycatch is minimized to the greatest extent possible for, especially for vulnerable species such as….seabirds….through mitigation measures that have been shown to be highly effective."* All of this evidence is absent, and the rationale does not warrant the score awarded. It is clear from information presented elsewhere in the report that vessels are using streamer lines and other bird bycatch mitigation measures, and these should be mentioned here.	Additional text has been provided to show strategies and monitoring are in place to mitigate risk of interaction and bycatch of seabirds.
8.2	The scoring is appropriate.	Thank you. No response needed.
8.3	The scoring is appropriate.	Thank you. No response needed.
8.4	The scoring is appropriate.	Thank you. No response needed.
8.4.1	The scoring is appropriate.	Thank you. No response needed.
8.5	The scoring is appropriate.	

8.5.1	See comments for SC8.1.2 above. The rationale presented here relates to only a subset of the non-target species and ignores seabird interactions again. An update of the rationale (perhaps referring back to any new information that you add to SC8.1.2 in the light of comments made there) would be appropriate here.	Additional text and reference have been added.
8.6	The scoring is appropriate.	Thank you. No response needed.
8.7	Again as for SC8.1.2 and 8.5.1 the rationale is very fish-centric. Once again the most obvious omission here is what has been done to address seabird bycatch in the fishery. To fully justify the score awarded the rationale should be updated to report on the mitigation measures that have been adopted to minimise the seabird bycatch in this fishery.	Additional text has been added.
8.8	The scoring is appropriate.	Thank you. No response needed.
8.9	The scoring is appropriate.	Thank you. No response needed.
8.10	I agree that this is not relevant.	Thank you. No response needed.
8.11	The scoring is appropriate.	Thank you. No response needed.
8.12	Again as for SC8.1.2, 8.5.1 and 8.7 the rationale is very fish-centric. Once again the most obvious omission here is what has been done to address seabird bycatch in the fishery. To fully justify the score awarded the rationale should be updated to report on the mitigation measures that have been adopted to minimise the seabird bycatch in this fishery.	Additional text and reference have been added to cover seabirds.
8.13	I agree that this is not relevant.	Thank you. No response needed.
9.1	The scoring is appropriate.	Thank you. No response needed.
9.2	The scoring is appropriate.	Thank you. No response needed.
9.3	The scoring is appropriate.	Thank you. No response needed.
10.1	There is clearly a well-founded mechanism in place for MCS in this fishery. A significant omission here, as for the observer programme earlier, is an explicit consideration of the extent to which the COVID-19 pandemic affected MCS operations. In many fisheries globally there was a period of time when routine fishery inspections at sea and ashore were not possible, and alternative approaches had to be implemented. Some detail about this would be appropriate here to justify the score awarded.	Additional text has been added to cover the impacts of COVID-19.

10.2	The scoring is appropriate.	Thank you. No response needed.
10.3	I agree that this is not relevant.	Thank you. No response needed.
10.3.1	I agree that this is not relevant.	Thank you. No response needed.
10.4	I agree that this is not relevant.	Thank you. No response needed.
10.4.1	I agree that this is not relevant.	Thank you. No response needed.
11.1	The scoring is appropriate.	Thank you. No response needed.
11.2	The scoring is appropriate.	Thank you. No response needed.
11.3	The scoring is appropriate.	Thank you. No response needed.
11.4	I agree that this is not relevant.	Thank you. No response needed.
Key Component D: Serious Impacts of the Fishery on the Ecosystem		
12.1	The scoring is appropriate.	Thank you. No response needed.
12.2	Noted that this is not a scoring clause.	This mistake has been corrected and labelled as "NA" in the scoring table.
12.2.1	Although the scoring is appropriate, the rationale is not particularly clear. It would be helpful to begin the rationale with a clear statement of whether there are any "main" associated species (*sensu* Appendix 1 Part 3 of RFM v2.1) before describing the objectives for protecting them.	The catch data tables have been simplified to show only relevant species and have been revised to make it easier to see which species falls within which category. Also, the tables and text within 12.2.1 have been revised to show that the team assessed based on % of total bycatch.
12.2.2	As for 12.2.1 the rationale is not very clear. It would be helpful to start with a list of the "minor" associated species (if any) before the descriptive text.	The catch data tables have been simplified to show only relevant species and have been revised to make it easier to see which species falls within which category. Also, the tables and text within 12.2.2 have been revised to show that the team assessed based on % of total bycatch.
12.2.3	It would seem to be appropriate to include a Table or summary of the statistics to show the actual catches, ABC and OFL for non-target species to justify the score fully.	Additional information from Ormseth (2021) has been added to the rationale to discuss OFL for "other skate".
12.2.4	The scoring is appropriate. It is good to see some information presented here that quantifies key interactions between the fishery and marine wildlife.	Thank you. No response needed.
12.2.5	The scoring is appropriate.	Thank you. No response needed.
12.2.6	The scoring is appropriate.	Thank you. No response needed.
12.2.7	This SC requires that "*There shall be knowledge of the essential habitats for the stock under consideration and potential fishery impacts on them….*". This information is missing. The only information presented here is about the next part of the SC (i.e. how impacts are managed).	Section 3.8.2 and the rationale have been updated to include additional information on habitat types. Section 3.8.2 and the inserted figures have been cross referenced in the rationale.

	I would have begun here by listing the essential habitats for Pacific cod and the potential impacts that have been identified by the management system. To justify a score of 10, this rationale needs to be updated to demonstrate that there is both knowledge of EFH for Pacific cod and the impacts of the fishery on them.	
12.2.8	Again, the rationale is heavy on process and light on key facts. The SC asks that "*There shall be outcome indicators….*". What are they? It appears from the text that if the stock assessor identifies that the reason that a stock is at or below a reference point, and if this is a result of impacts on EFH, then mitigation measures are considered and recommended to NPFMC. This process is not the same thing as having indicators in place for "*..avoiding, minimising or mitigating the impacts...*" as required by this SC. It is, if you will excuse the metaphor, a process for having a debate about whether it would have been a good idea to close the stable door as the horse is vanishing over the horizon. This process will always be too little, too late. Similar comments apply with regard to HAPCs. What are the outcome indicators for these areas, and how are they consistent with the management objectives for these habitats? To justify a score of 10 there is a need for more detail here that is directly relevant to the SC. The current text does not support the score awarded.	Text has been added to Section 3.8.2 and to this rationale to address these concerns and provide more detail.
12.2.9	The scoring is appropriate.	Thank you. No response needed.
12.2.10	The scoring is appropriate.	Thank you. No response needed.
12.2.11	The scoring is appropriate.	Thank you. No response needed.
12.3	The scoring is appropriate.	Thank you. No response needed.
12.4	The scoring is appropriate.	Thank you. No response needed.
12.5	The scoring is appropriate.	Thank you. No response needed.
12.6	The scoring is appropriate.	Thank you. No response needed.
12.7	The rationale here is cursory and fails to mention initiatives that are documented elsewhere in the report and that show how fishery management organisations are using MPAs: for instance HAPCs, EFH (see SC12.2.8) and the various closures documented in the map at SC12.2.6.	As suggested, supporting text from other areas has been inserted into the rationale.

	As such, the rationale neither addresses the SC adequately nor makes use of the available information. Additional justification is needed to support the score of 10.	
13.1	NA	NA
13.1.1	NA	NA
13.2	NA	NA
13.2.1	NA	NA
13.3	NA	NA
13.4	NA	NA
13.5	NA	NA
13.6	NA	NA
13.7	NA	NA
13.7.1	NA	NA
13.7.2	NA	NA
13.7.3	NA	NA
13.8	NA	NA
13.9	NA	NA
13.10	NA	NA
13.11	NA	NA
13.12	NA	NA
13.13	NA	NA
6 Non-conformances and corrective actions	The proposed milestones for the non-conformance are appropriate. I note that the text in row 4 of the table states in the second paragraph that "*At this 4th annual audit….*". The paragraph before the table states that "*One minor non-conformance (NC) was raised…during the reassessment…*". Both statements cannot be true. I would suggest that the text prior to the table should be amended to reflect the fact that an NC was raised at the 4th surveillance audit and is being carried forward at this re-assessment.	The text has been revised to be clearer that the NC was raised during the 4th surveillance of the previous certification cycle.
7 References	There is a comprehensive bibliography.	Thank you. No response needed.
Appendix 1 Stakeholder submissions	Not applicable – there were no stakeholder comments.	NA

Appendix 2 Peer reviews	NA	NA

Peer Reviewer 2

General comments:

Comment	CB response
In my opinion the assessment team has done a very thorough job of reviewing the Alaska Pacific cod fishery against requirements of the RFM Standard. Below are my comments and suggestions on the assessment report. Notwithstanding this feedback, I do concur with the assessment team's overarching conclusion that the Alaska Pacific cod fishery meets the RFM Standard and should be re-certified.	Thank you. See responses to specific comments below.

Specific comments

Section/Clause	Comment	CB response
1 Summary	Good	
2 Assessment team and peer reviewer details	The assessment team is highly experienced and appears to be more than adequately qualified to perform re-assessment of Alaska Pacific cod fishery against the RFM standard.	Thank you. No response needed.
3 Background	Section 3.3 AI Stock assessment section refers to PIs from the MSC scheme. Section 3.8.1 Tables 18 and 19 would be more user-friendly if entries were sorted by weight in descending order rather than alphabetized. Also, please double-check how taxa are categorized. Some are listed as ETPs but should probably be identified as PSCs (red, blue & golden king crabs; opilio & bairdi crabs, halibut). Section 3.8.2. Could this section be expanded to provide a cursory description of habitat (substrate, benthic communities, etc)? Also, unclear why Table 18 and 19 list some benthic epifauna (sponges, corals, bryozoans) as 'NA' rather than 'habitat'	Text has been revised accordingly. The team did not feel that organizing by weight was appropriate since several species are listed by number instead of weight; Therefore, the tables were revised to (1) remove species that are ≤0.00% of the catch, (2) label species as "PSC (ETP)" as appropriate, and (3) highlight species that are ≥1% of the catch. Section 3.8.2 has been revised to include additional information as requested. As per the "NA" labelling comment, one of the notes with the tables is "'NA' is used in place of Non-target, PSC/ETP, or Habitat when the species caught was non-specific or unidentifiable." The team concluded that it was not appropriate to categorize the taxa/species if it could not be specified.

4 Assessment process	Adequately described	Thank you. No response needed.
5 Assessment outcome	Agree with scoring summary. Note a few corrections in Table 21 (SC 3.2, 12.2 are NA)	Table has been corrected.
Key Component A: The Fisheries Management System		
1.1	Agree	Thank you. No response needed.
1.2	Agree	Thank you. No response needed.
1.2.1	Agree	Thank you. No response needed.
1.3	Agree, SC 1.3 is N/A	Thank you. No response needed.
1.3.1	Agree, SC 1.3.1 is N/A	Thank you. No response needed.
1.4	Agree, SC 1.4 is N/A	Thank you. No response needed.
1.4.1	Agree, SC 1.4.1 is N/A	Thank you. No response needed.
1.5	Agree, SC 1.5 is N/A	Thank you. No response needed.
1.6	Agree	Thank you. No response needed.
1.6.1	Agree, SC 1.6.1 is N/A	Thank you. No response needed.
1.7	Agree	Thank you. No response needed.
1.8	Agree	Thank you. No response needed.
1.9	Agree, SC 1.9 is N/A	Thank you. No response needed.
Key Component B: Science and Stock Assessment Activities and the Precautionary Approach		
2.1	Agree	Thank you. No response needed.
2.1.1	Agree	Thank you. No response needed.
2.1.2	Evidence EP: I fully agree that robust resources and scientific/technical capacity are in place to manage the Pacific cod fishery. But the rationale should identify how those resources/capacities are deployed to represent the fisheries sector in the coastal management process.	Thank you. Additional text has been added to indicate how resources and technical capacity is made available to fishing communities.
2.2	Evidence EP: Does the NPFMC play a role representing the fisheries sector on non-fishery-related proposals for the coastal zone (e.g., Pebble Mine permit, offshore oil development)?	Text has been added to confirm the NPFMC will contribute to non-fishery related proposals that may impact fishery resources and habitats.
2.3	Agree	Thank you. No response needed.
2.4	Rationale is ok. The three EPs (process, status, evidence) have been combined?	The text has been amended and the EPs separated.
2.5	Evidence EP: refers back to SC 2.1.1 but that SC does not discuss the CDQ program?	The text has been amended and no longer refers to SC 2.1.1.
2.6	Agree	Thank you. No response needed.

2.7	Agree	Thank you. No response needed.
3.1	Agree with the team's rationale and their finding of a non-conformity for state-managed Pacific cod stocks	Thank you. No response needed.
3.1.1	Agree. Good description of stock-specific interactions with ETPs	Thank you. No response needed.
3.1.2	Agree	Thank you. No response needed.
3.1.3	Agree	Thank you. No response needed.
3.2	N/A	Thank you. No response needed.
3.2.1	Agree	Thank you. No response needed.
3.2.2	Agree	Thank you. No response needed.
3.2.3	Agree	Thank you. No response needed.
3.2.4	Agree	Thank you. No response needed.
4.1	Agree	Thank you. No response needed.
4.1.1	Agree	Thank you. No response needed.
4.1.2	Agree, SC 4.1.2 should be scored as being in full conformity.	Thank you. No response needed.
4.2	Agree	Thank you. No response needed.
4.2.1	Agree	Thank you. No response needed.
4.3	Agree	Thank you. No response needed.
4.4	Agree	Thank you. No response needed.
4.5	Agree	Thank you. No response needed.
4.6	Evidence EP: Also possibly relevant to SC 4.6 is NPFMC's recent efforts to develop a Local Knowledge/Traditional Knowledge/Subsistence Taskforce in connection with the Bering Sea Fishery Ecosystem Plan	Text has been revised to include this information.
4.7	Agree, SC 4.7 is N/A	Thank you. No response needed.
4.8	Agree, SC 4.8 is N/A	Thank you. No response needed.
4.9	Agree, SC 4.9 is N/A	Thank you. No response needed.
4.10	Agree, SC 4.10 is N/A	Thank you. No response needed.
4.11	Agree, SC 4.11 is N/A	Thank you. No response needed.
5.1	Agree	Thank you. No response needed.
5.1.1	Agree, SC 5.1.1 should be scored as being in full conformity.	Thank you. No response needed.

5.1.2	Agree	Thank you. No response needed.
5.2	Agree	Thank you. No response needed.
5.3	Agree	Thank you. No response needed.
5.4	Agree, SC 5.4 is N/A	Thank you. No response needed.
5.5	Status EP: NMFS also has an obligation to protect confidential info (e.g., NOAA Administrative Order 216-100)	Text has been revised to include this information.
6.1	Agree	Thank you. No response needed.
6.2	Agree	Thank you. No response needed.
6.3	Agree	Thank you. No response needed.
6.4	Agree	Thank you. No response needed.
6.5	Agree	Thank you. No response needed.
7.1	Agree	Thank you. No response needed.
7.1.1	Agree	Thank you. No response needed.
7.1.2	Status EP: CIE review of GOA Pacific cod assessment done in 2018? (see SC 5.1)	Text has been revised to include this information.
7.2	Agree, SC 7.2 is N/A	Thank you. No response needed.
Key Component C: Management, Measures, Implementation, Monitoring, and Control		
8.1	Agree	Thank you. No response needed.
8.1.1	Agree	Thank you. No response needed.
8.1.2	Agree	Thank you. No response needed.
8.2	Agree	Thank you. No response needed.
8.3	Agree	Thank you. No response needed.
8.4	Agree	Thank you. No response needed.
8.4.1	Agree	Thank you. No response needed.
8.5	Agree	Thank you. No response needed.
8.5.1	Agree	Thank you. No response needed.
8.6	Agree	Thank you. No response needed.
8.7	Agree	Thank you. No response needed.
8.8	Status EP: Rationale does not address methods & technologies to minimize the loss of pots or to minimize ghost fishing by lost or abandoned pots	Additional text provided in relation to cod traps/pots and initiatives to remove lost gear.
8.9	Agree	Thank you. No response needed.

8.10	Agree, SC 8.10 is N/A	Thank you. No response needed.
8.11	Agree	Thank you. No response needed.
8.12	Agree	Thank you. No response needed.
8.13	Agree, SC 8.13 is N/A	Thank you. No response needed.
9.1	Agree	Thank you. No response needed.
9.2	Agree	Thank you. No response needed.
9.3	Agree	Thank you. No response needed.
10.1	Agree	Thank you. No response needed.
10.2	Agree	Thank you. No response needed.
10.3	Agree, SC 10.3 is N/A	Thank you. No response needed.
10.3.1	Agree, SC 10.3.1 is N/A	Thank you. No response needed.
10.4	Agree, SC 10.4 is N/A	Thank you. No response needed.
10.4.1	Agree, SC 10.4.1 is N/A	Thank you. No response needed.
11.1	Table in SC 11.1: Are the observed violation rates for 2019 and 2020 (16% and 14%) correct? Unclear how this reflects a “very high compliance” rate as cited in SC 3.2.2.	Thank you, they were incorrect. They have been corrected (2019 = 2% and 2020 = 3%).
11.2	Agree. Note: Process EP and Status EP are combined.	Thank you. The EPs have been separated.
11.3	Agree	Thank you. No response needed.
11.4	Agree, SC 11.4 is N/A	Thank you. No response needed.
Key Component D: Serious Impacts of the Fishery on the Ecosystem		
12.1	Evidence EP: Here the team may want to reference the work by e.g. Shotwell et al., (2021) to develop ecosystem indicators for use in stock assessment – see Ecosystem and Socioeconomic Profiles (ESPs) appended to the SAFE report for GOA Pacific Cod	Reference to Shotwell et al. (2021) has been added to the Evidence EP.
12.2	N/A	NA
12.2.1	Looking at RFM guidance to performance evaluation v2.0…are the main/minor thresholds based on % of target species catch by weight? Or are thresholds based on % of total bycatch profile by weight?	The catch data tables have been simplified to show only relevant species and have been revised to make it easier to see which species falls within which category. Also, the tables and text within 12.2.1 have been revised to show that the team assessed based on % of total bycatch.
12.2.2	Which species, if any, did the assessment team ascribe to ‘minor’ associated species?	The catch data tables have been simplified to show only relevant species and have been revised to make it easier to see which species falls within which category. Also, the tables and text within 12.2.2 have been revised to show that the team assessed based on % of total bycatch.

12.2.3	Status EP: As noted by the assessment for SC 12.2.2, unidentified skates could be considered a main associated species. Please provide additional detail to support the conclusion that the skates taken as bycatch in the Pacific cod fishery are not being fished beyond OFL. Perhaps summarize salient points from Ormseth 2021?	Additional information from Ormseth (2021) has been added to the rationale.
12.2.4	Short-tailed albatross, BSAI fishery: Please identify the limit on incidental takes of short-tailed albatross for AK groundfish fisheries. Also, please double-check the number of reported STA takes by the fishery in 2020 because it appears that Krieger and Eich reported only two, not eleven.	Additional information on the limit was added to the rationale. Also, the team double checked the number, and 11 appears to be correct. Krieger and Eich (2021) reported an annual average of 2 for 2011-2020.
12.2.5	Agree	Thank you. No response needed.
12.2.6	Agree	Thank you. No response needed.
12.2.7	Agree with score. But little detail is given on which habitats are highly vulnerable to damage by the gear types used in the fishery (trawl, pot, longline). It would be helpful to identify and briefly describe the main habitat(s)/benthic community type(s) the Pacific cod fishery interacts with. Perhaps this could be given as background info in section 3.8.2?	Section 3.8.2 has been updated to include additional information on habitat types. Section 3.8.2 and the inserted figures have been cross referenced in the rationale.
12.2.8	Agree	Thank you. No response needed.
12.2.9	Agree	Thank you. No response needed.
12.2.10	Agree	Thank you. No response needed.
12.2.11	Agree	Thank you. No response needed.
12.3	Process EP: please check reference in the 3rd paragraph to “these flatfish species.” Status EP: Are any of the Pacific cod stocks under assessment considered a key prey species?	The text was corrected to discuss Pacific cod instead of flatfish.
12.4	Agree. But see question on SC 12.3	Specific reference to Pacific cod was added.
12.5	Agree	Thank you. No response needed.
12.6	Agree	Thank you. No response needed.
12.7	Evidence EP: Agree with the team’s rationale. Could also cite the current federal inventory of MPAs (https://marineprotectedareas.noaa.gov/), as evidence of conformity.	Reference to the MPA inventory has been added to the rationale.
13.1	N/A	NA
13.1.1	N/A	NA
13.2	N/A	NA
13.2.1	N/A	NA

13.3	N/A	NA
13.4	N/A	NA
13.5	N/A	NA
13.6	N/A	NA
13.7	N/A	NA
13.7.1	N/A	NA
13.7.2	N/A	NA
13.7.3	N/A	NA
13.8	N/A	NA
13.9	N/A	NA
13.10	N/A	NA
13.11	N/A	NA
13.12	N/A	NA
13.13	N/A	NA
6 Non-conformances and corrective actions	One – a non-conformity against SC 3.1 regarding the repeal of long-term objectives for the state-managed Pacific cod stocks. The team's description of this NC is adequately supported by objective evidence. The proposed action plan, milestones, and timeframe are reasonable.	Thank you. No response needed.
7 References	Good	Thank you. No response needed.
Appendix 1 Stakeholder submissions	None included	NA
Appendix 2 Peer reviews	N/A	NA

ABOUT DNV

DNV is a global independent certification, assurance and risk management provider, operating in more than 100 countries. Through its broad experience and deep expertise, DNV advances safety and sustainable performance, sets industry benchmarks, drives innovative solutions.

Whether certifying a company's management system or products, providing training, assessing supply chains or digital assets, DNV enables customers and stakeholders to make critical decisions with confidence, continually improve and realize long-term strategic goals sustainably.

DNV draws on its wide technical and industry expertise to help companies worldwide build consumer and stakeholder trust. Driven by its purpose, to safeguard life, property, and the environment, DNV helps tackle the challenges and global transformations facing its customers and the world today and is a trusted voice for many of the world's most successful and forward-thinking companies.

DNV Business Assurance USA, Inc.
1400 Ravello Dr.
Katy, TX 77449
Phone 877-368-3530

www.dnvcert.com/ contactus@dnv.com