
DNV·GL

FINAL ASSESSMENT REPORT AND CERTIFICATION DECISION

Re-assessment of the Alaska Pacific Cod Fishery

Alaska Fisheries Development Foundation (AFDF)

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The objective of this report is the re-assessment of the Alaska Pacific Cod fishery against the RFM standard V1.3.

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GLOSSARY

Abbreviations & acronyms

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

1 SUMMARY AND THE UNIT OF THE CERTIFICATION

The purpose of this report is a full re-assessment of the Alaska Pacific Cod fishery against the Responsible RFM) standard V1.3.

This report contains the findings of the RFM Fisheries re-assessment audit conducted for the Alaska cod fishery during 22-27 June 2017.

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

The Alaska RFM Certification programme uses the fundamental clauses of the Alaska RFM Conformance Criteria Version 1.3 and is in accordance with ISO 17065 accredited certification procedures. The assessment is based on the fundamental clauses specified in the Alaska RFM Conformance Criteria. It is based on six major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labeling of products from marine capture fisheries (2009). The fundamental clauses are:

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

Table 1.1 General information and the Unit of the Certification

Fishery name	Pacific cod Fishery		
The Unit of the Certification	Applicant Group:	Alaska Fisheries Development Foundation (AFDF)	
	Product Common Name (<i>Species</i>):	Pacific cod (<i>Gadus macrocephalus</i>)	
	Geographic Location:	Gulf of Alaska and Bering sea & Aleutian Islands within Alaska jurisdiction (200 nautical miles EEZ).	
	Gear Types:	Bottom trawl, Longline, Pot and Jig gear	
	Principal Management Authority:	National Marine Fisheries Service; North Pacific Fishery Management Council; Alaska Department of Fish and Game; Alaska Board of Fisheries	
Date certified	17 April 2013	Date of certificate expiry	16 April 2018
Audit type	Re-assessment		
Date of audit	22-27 June 2017		
Surveillance team	Lead assessor: Anna Kisseleva Assessor(s): Andrew Hough, Bill Brodie, Paul Knapman		

1.1 Assessment timeline

Table 1.1.1 Assessment timeline

Event	Date
Announcement of re-assessment:	16 May 2017
Site visit and stakeholder consultations:	22-27 June 2017
Date of recertification:	5 December 2017

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

Fundamental Clause	Evidence adequacy rating:	Justification:
1: Structured and legally mandated management system	High	There is an effective legal (MSFCMAFMPs) and administrative framework (NMFS/NPFMC – ADFG/BOF) established at the local and national level (state/federal) appropriate for fishery resource conservation and management.
2: Coastal area management frameworks	High	Management organizations participate in coastal area management institutional frameworks, decision-making processes and activities related to the fishery and its users, in support of sustainable and integrated resource use, and conflict avoidance. The NPFMC and the BOF are required to manage the Pacific cod trawl, longline, pot and jig fisheries in a sustainable and transparent manner, as mandated by the MSFCMA.
3: Management objectives and plan	High	The BSAI and GOA FMPs present long-term management objectives for the Alaska Pacific cod fisheries. Seven state-managed Pacific cod fisheries are subject to an annually-published FMP.
4: Fishery data	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 ADF&G collect fishery data and conduct fishery independent surveys to assess Pacific cod fisheries and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected.
5: Stock assessment	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 (NMFS, ADF&G, ASMI). 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: Biological reference points and harvest control rule	High	The EBS, AI, and GOA groundfish management plans define target and limit reference points and harvest control rules for Pacific cod and other groundfish. Each Stock Assessment and Fishery Evaluation (SAFE) report describes the current fishing mortality rate, and stock biomass relative to the reference points.
7: Precautionary approach	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.
8: Management measures	High	Alaska Pacific cod commercial fisheries are managed according to a modern management plan that attempts to balance long-term sustainability of the resources with

		optimum utilization. For every change/amendment or new development affecting fisheries management and therefore modifying the FMPs, there is an evaluation of alternative conservation and management measures, including considerations of their cost effectiveness and social impact.
9: Management measures to produce maximum sustainable levels	High	Specific management measures are designed and implemented to maintain stocks at levels capable of producing maximum sustainable yields. Also, efforts are made to ensure that resources and habitats critical to the well-being of such resources Essential Fish Habitat (EFH) which have been adversely affected by fishing or other human activities are restored.
10: Appropriate standards of fisher's competence	High	Alaska enhances through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishers are maintained up to date by the fishery management organizations.
11: Effective legal and administrative framework	High	The Alaska Pacific cod fishery uses enforcement measures including vessel monitoring systems (VMS) on board vessels, USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL).
12: Framework for sanctions	High	The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations: 1) Issuance of a citation (a type of warning), usually at the scene of the offense, 2) Assessment by the Administrator of a civil money penalty, 3) for certain violations, judicial forfeiture action against the vessel and its catch, 4) Criminal prosecution of the owner or operator for some offenses. In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The Alaska Wildlife Troopers enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation.
13: Impacts of the fishery on the ecosystem	High	The NPFMC, NOAA (NMFS) and other relevant organisations continue to closely monitor the fisheries and their respective environmental effects. Appropriate significance appears to be allocated to issues of concern

(including in response to stakeholder concerns – such as effects on bycatch populations and effects on habitat). Fishery management plans, Environmental Impact Assessments and other assessments are kept under review. No changes are apparent in the management of the GoA or BSAI fisheries that would detrimentally affect performance against the confidence ratings for any supporting clauses. Full conformance continues against all supporting clauses.

1.3 Non-conformances raised and corrective action plans

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

1.3.1 Recommendation

- | |
|--|
| <p>3. Management objectives shall be implemented through management rules and actions formulated in a plan or other framework.</p> <p>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.</p> |
|--|

Evaluation Parameters

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plan/framework or legal rules.

Evidence basis:

In combination, the requirement for the NPFMC 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.

The state waters Pacific cod management plan have, apparently, been developed and implemented on the basis of guiding principles developed for BOF ground fish management plans more than 20 years ago. It is recommended that the BOF review the guiding principles and more explicitly state them in their Management Plans.

1.4 The recommendation for certification of the Assessment Team

The Unit of Certification	Status of certification	Comment
<p>Pacific cod commercial fishery employing bottom trawl gear, longline gear, pot gear and jig gear within Alaska jurisdiction (200 nautical miles EEZ), and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADF&G) & Board of Fisheries (BOF)] management.</p>	<p>Certified, re-assessment completed.</p>	<p>Following the results of the re-assessment audit conducted in June 2017, the assessment team recommended the re-certification of this fishery according to the RFM Fisheries standard.</p>

1.5 Certification decision

Date: 05-12-2017
Project: Alaska Cod

CERTIFICATION DECISION TEAM MEMBERS

Name	Role	Key competence
Sander Buijs	Decision maker	Program management
Anna Kiseleva	Certification recommendation	Fishery re source management
Ismael Belmarez	Decision maker	Certification activities

CERTIFICATION CHECKLIST

Area	Assessment	Remarks
Unit of certification/ Scope	OK, compliant	
Assessment plan	OK	
Report contents	Ok, peer review comments addressed Team composition checklist in place No stakeholder comments received	
Scoring summary	No NC's detected,	
CA, CAP in place	NA	
Certification decision	<input checked="" type="checkbox"/> Certify per <input type="checkbox"/> Defer <input type="checkbox"/> Reject	Formal accreditation pending. New certificate validity 06-december-2017 until 05-december-2022

SIGNED

Name	Signed
Sander Buijs	5-12-2017 Sander Buijs

2 ASSESSMENT TEAM AND PEER REVIEWERS DETAILS

Anna Kiseleva

DNV GL Lead Assessor:

Anna is a senior assessor responsible for MSC Fisheries and RFM certification schemes at DNV GL Business Assurance. She holds MSc degree in International fisheries management from the University of Tromsø and MSc degree in Business Management from Murmansk State Technical University. She has over 10 years of experience in the global seafood industry incl. assessment services, consultancy and project management. She is an experienced project management with proven ability to lead cross-disciplinary teams. She has been involved in the delivery of the Fisheries assessment services since 2008.

Andrew Hough

Main area of responsibility
Fundamental clause F (Serious Impacts of the Fishery on the Ecosystem):


Following three years PhD research on crustacean ecology, Andy has worked in the field of marine research and management for over twenty years, including marine conservation biology, fishery impacts on marine ecosystems, marine and coastal environmental impact assessment and policy development.

Andrew has been active in the development of Marine Stewardship Council certification since 1997, when involved in the pre-assessment of the Thames herring fishery. He was a founding Director of Moody Marine and led the establishment of Moody Marine fishery certification systems. He has also worked with MSC on several specific development projects, including those concerned with the certification of small scale/data deficient fisheries. He has been Lead Assessor on many fishery assessments to date. This has included Groundfish (e.g. cod, haddock, pollock, hoki, hake, flatfish), Pelagics (e.g. tuna species, herring, mackerel, sprat, krill, sardine) and shellfish (molluscs and crustacea); included evaluation of the environmental effects of all main gear types and considered many fishery administrations including the North Atlantic, South Atlantic, Pacific, Southern Ocean and in Europe, North America, Australia and New Zealand, Japan, China, Vietnam and Pacific Islands. He has recently acted solely as an expert team member of Principle 2 inputs of European inshore fisheries and Falkland Islands Toothfish. Andrew has also been involved in the development of certification schemes for individual vessels (Responsible Fishing Scheme) and evaluation of the Marine Aquarium Council standards for trade in ornamental aquarium marine species. Consultancy services have included policy advice to the Association of Sustainable Fisheries, particularly with regard to the implications of MSC standard development, and assistance to fisheries preparing for, or engaged in, MSC assessment.

William (Bill) Brodie

Main area of responsibility
Fundamental clause B (Science and Stock Assessment activities) and C (The precautionary approach) and D (Management measures):

Bill Brodie is an independent fisheries consultant with previously, a 36-year career with Science Branch of Fisheries and Oceans Canada (DFO, Newfoundland and Labrador Region). He has a BSc in Biology from Memorial University of Newfoundland and Labrador. For the last twelve years with DFO he worked as Senior Science Coordinator/Advisor on Northwest




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

Paul Knapman

Main area of responsibility
Fundamental clause A (The Fisheries Management System) and E (Implementation monitoring and control):

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

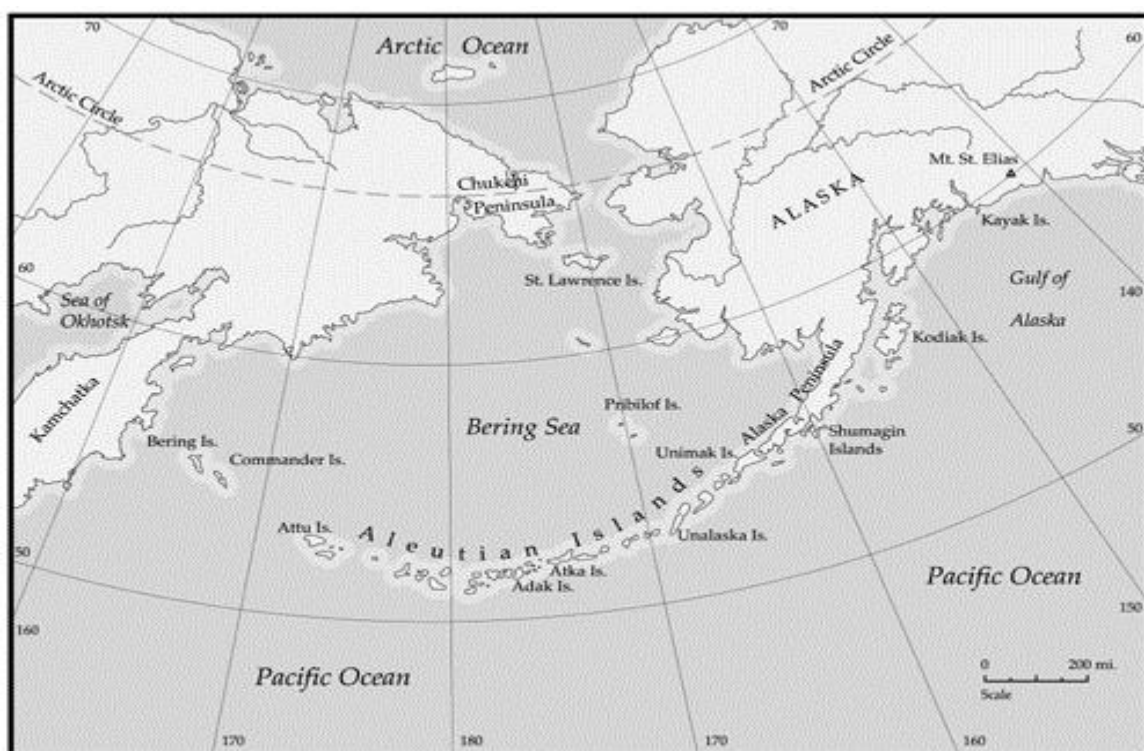


Moody Marine as their Americas Regional Manager, responsible for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries. Paul returned to consultancy in 2015.

3 THE BACKGROUND OF THE FISHERY TO BE RE-CERTIFIED

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 eastern Bering Sea (EBS) as well as in the Aleutian Islands (AI) and Gulf of Alaska (GOA) areas (Fig. 3.1.1). Tagging studies have demonstrated significant migration both within and between the EBS, AI, and Gulf of Alaska (Thompson, 2016 - EBS P. cod SAFE). However, recent research indicates the existence of discrete stocks in the EBS and AI (Spies 2012¹). Although the resource in the combined EBS and AI (BSAI) region had been managed as a single unit from 1977 through 2013, separate harvest specifications have been set for the two areas since the 2014 season. The resource in GOA is managed as a single stock.



Fig, 3.1.1 Map showing Bering Sea, Gulf of Alaska, and Aleutian Islands. Source: <http://www.common-place-archives.org/vol-05/no-02/namias/index.shtml>

Adult P. cod occur in depths from the shoreline to 500 m, although the SAFE authors report that occurrence in depths greater than 300 m is fairly rare in EBS and GOA. Preferred substrate is soft sediment, i.e. mud, clay, 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. 2014² 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 P. cod fisheries operate within the Alaska EEZ only, and include state-managed waters within 3 nautical miles of shoreline. In the EBS, P. 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 (Fig. 3.1.3). Historically, the majority of the GOA catch has come from the Central

¹ Spies 2012. *Transactions of the American Fisheries Society* 141:1557-1573.

² Neidetcher et al. 2014. <http://dx.doi.org/10.1016/j.dsr2.2013.12.006>

regulatory area (Fig. 3.1.3, 3.1.4). 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 (Fig. 3.1.2).

In Alaskan state waters (within 3 nautical miles of shoreline), there are 8 state-managed P. cod fisheries, occurring in these areas³: Kodiak, Chignik, South Alaska Peninsula, Aleutian Islands, Southeast Alaska, Prince William Sound, Cook Inlet, and BS/Dutch Harbor. A Guideline Harvest Level (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 (GHR) 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.

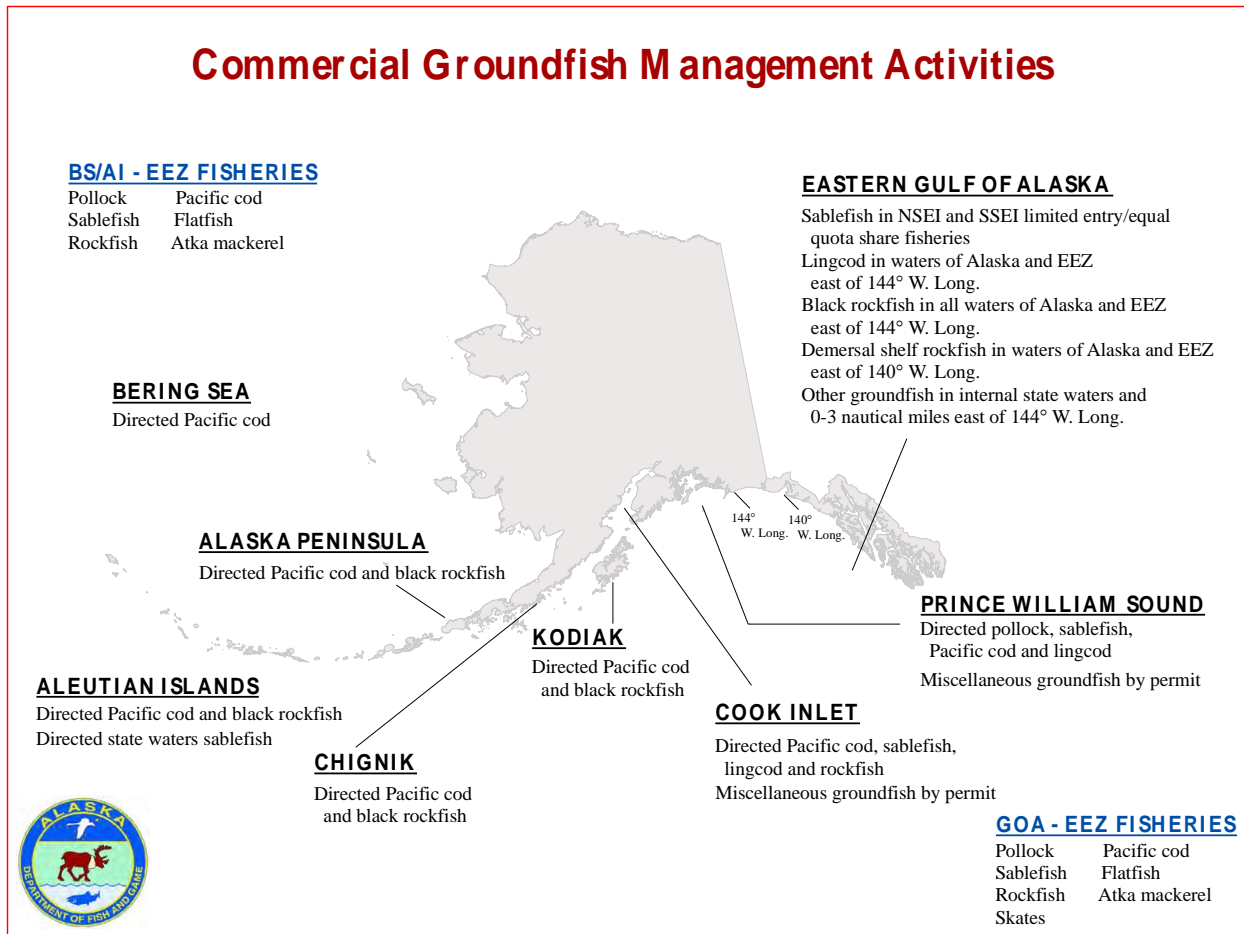


Figure 3.1.2 Chart showing the eight state managed fishing areas for Pacific cod

(Source:

http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.groundfishmaps_management)

³ http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.groundfishmaps_management

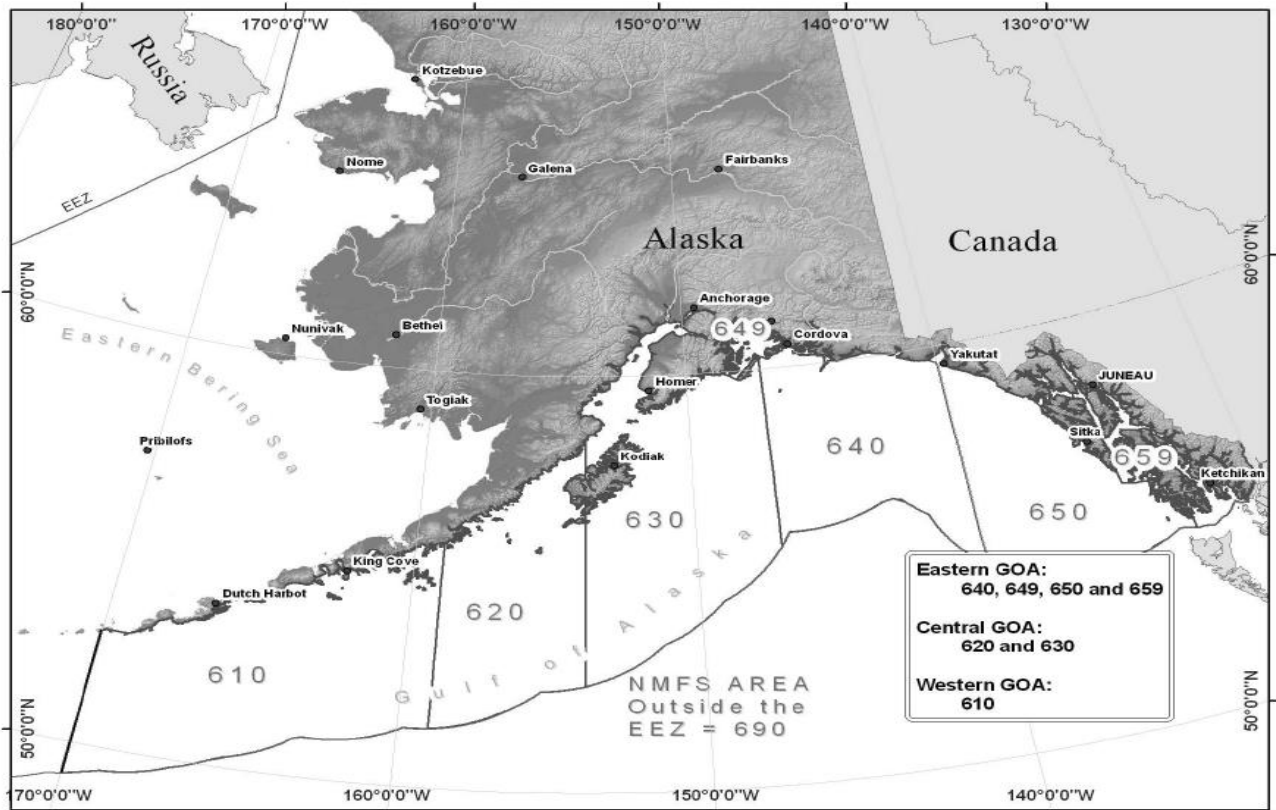
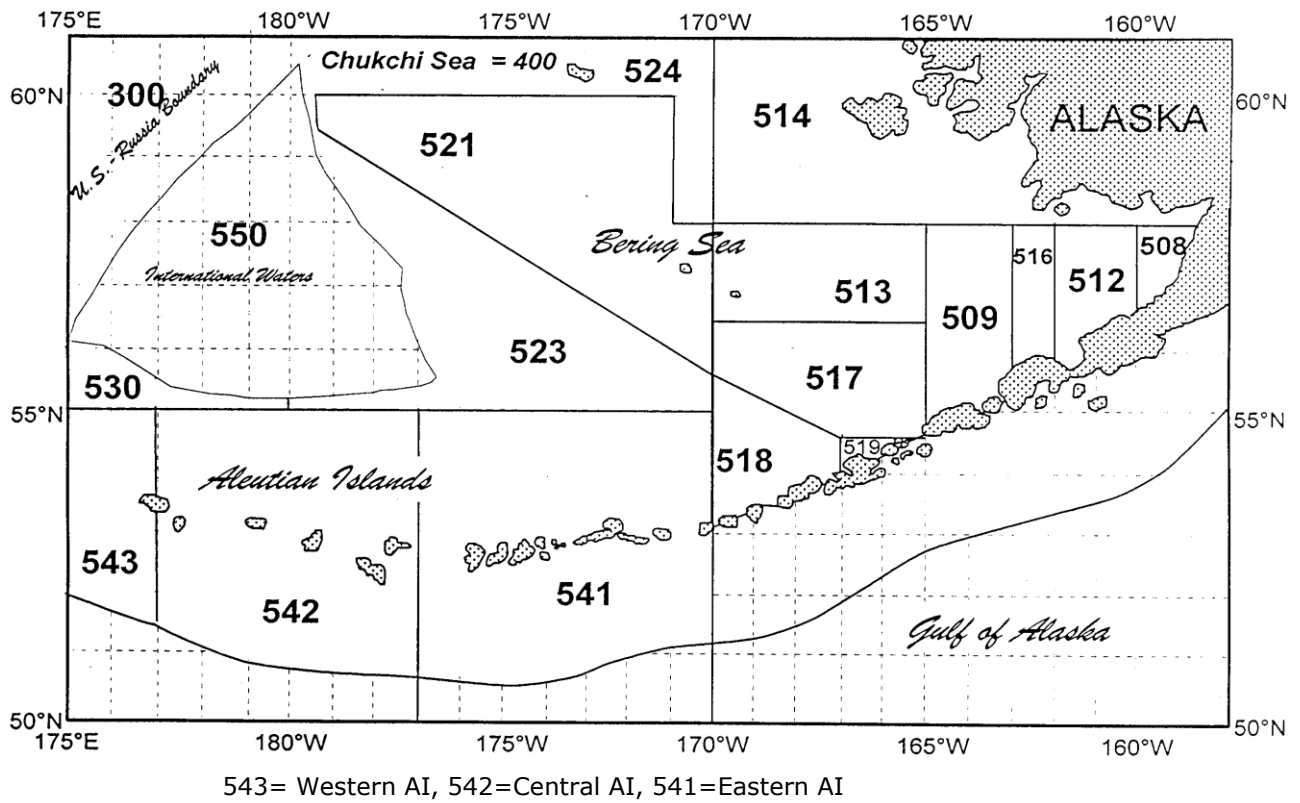


Fig. 3.1.3. Management areas for federally managed stocks in Bering Sea-Aleutian Islands (upper panel⁴) and Gulf of Alaska (lower panel⁵).

⁴ BSAI map <https://www.ecfr.gov/graphics/pdfs/er15no99.000.pdf>

⁵ GOA map <https://alaskafisheries.noaa.gov/sites/default/files/fig3.pdf>

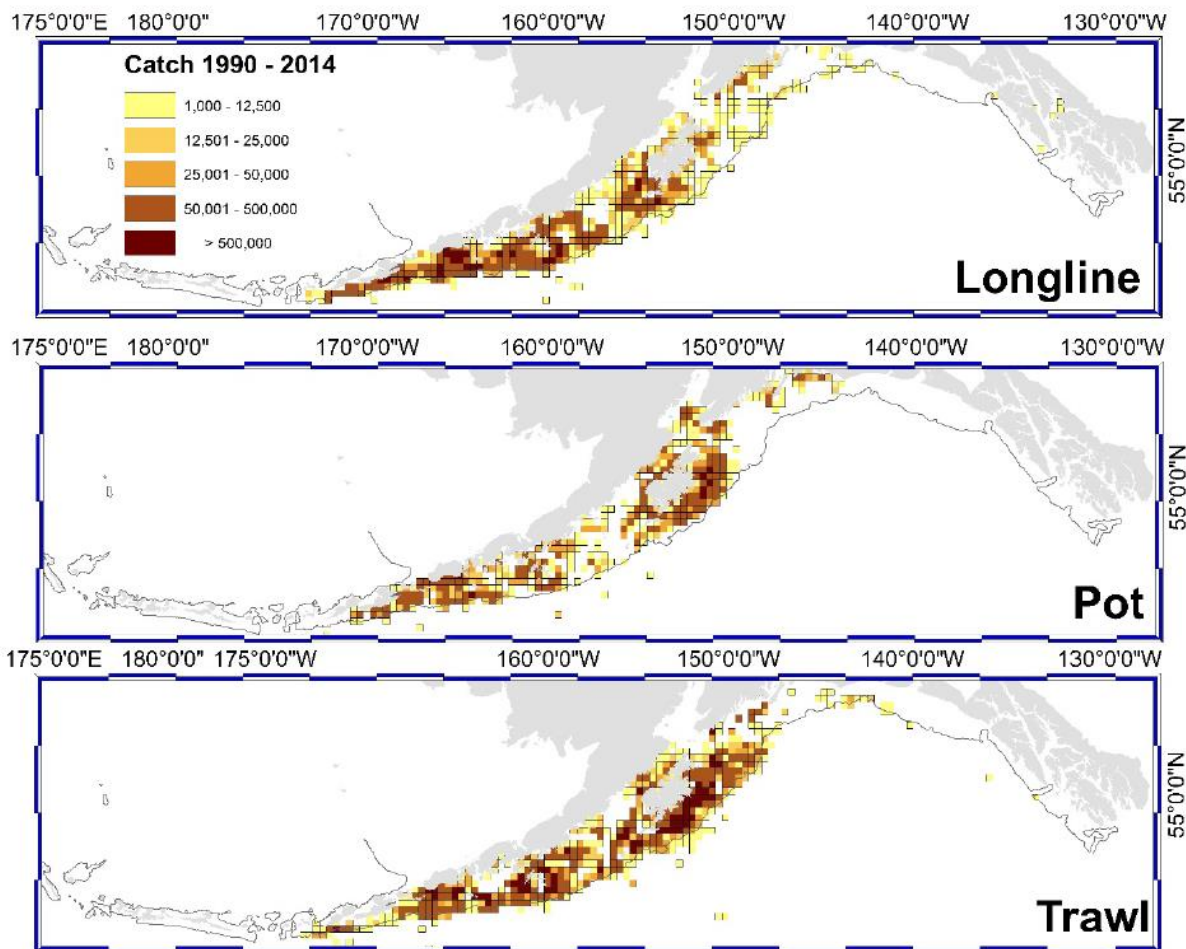


Fig 3.1.4. Location of P. cod fisheries in GOA by 20 sq. km grid, from 1990-2014. (Source: Fig. 2.3 Barbeaux et al. 2016 GOA P.cod SAFE).

3.1b Fishery sector landings and the general economic situation of the fishery

The following section on the economics of the fishery are from the 2016 P. cod SAFE reports, specifically from the sections by Fissel. Additional detail on the economics of the Alaskan P. cod fisheries can be found in the 2016 economic SAFE, by Fissel et al⁶.

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. Cod production has steadily increased in the last ten years, with a 34 percent increase in volume in the last five years. European Atlantic cod and U.S. Pacific cod remain the two major sources supplying the 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 cod is also affected by activity in the pollock fisheries, as cod and pollock are commonly used to produce breaded fish portions. U.S. exports of 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)

⁶ Fissel et al. 2016. <http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf>

are also important export destinations. Approximately 30% of Alaska's cod production is estimated to remain in the U.S.

BSAI: Pacific cod is the second highest species in terms of catch in the Bering Sea & Aleutian Island (BSAI) regions. Pacific cod accounted for 13% of the BSAI's groundfish harvest and 75% of the total Pacific cod harvest in Alaska. Retained catch of Pacific cod decreased 1% to 231 thousand t in 2015, and though down from its peak of 241 thousand t in 2012, is 35% higher than the 2006-2010 average. The products made from BSAI Pacific cod had a first-wholesale value of \$362 million in 2015, which was up from \$354 million in 2014 and above the 2006-2010 average of \$300 million. The higher revenue in recent years is largely the result of increased catch and production levels as the average first-wholesale price of Pacific cod products have declined in recent years.

The P. cod TACs in EBS and AI Regions are allocated to multiple fleets, with CDQ entities receiving 10% of the total BSAI quota. The largest sectoral allocation goes to the freezer longline catcher-processors (CPs) which receive roughly 44% of the total BSAI cod quota. Vessels in this sector have formed a voluntary cooperative that allows them to form private contracts among members to distribute the sectoral allocation. The remaining large sectors are the trawl CPs, trawl catcher vessels (CVs,) the pot gear CVs and some smaller sideboard limits to cover the catch of P. cod while targeting other species. The CVs (collectively referred to as the inshore sector) make deliveries to shore-based processors, and catcher/processers process catch at-sea before going directly to the wholesale markets. Among the at-sea CPs, catch is distributed approximately three-quarters to the hook-and-line and one quarter to trawl. The inshore sector accounts for 25%-30% of the total BSAI Pacific cod catch of which approximately two-thirds is caught by the trawl and one-third by the pot gear sectors.

Head and gut (H&G) production is the focus of the BSAI processors but a significant amount of fillets are produced as well. H&G typically constitutes over 80% of value and fillets over 10% of value. Shoreside processors produce the majority of the fillets. Almost all of the at-sea sector's catch is processed into H&G.

GOA: Pacific cod is a critical species in the catch of GOA fisheries. P. cod typically accounts for just under 30% of the GOA's FMP groundfish harvest and over 20% of the total Pacific cod harvest in Alaska. Retained catch of Pacific cod decreased 4% to 54 thousand t in 2015 (as a result of a mid-year closure of the fishery), and though down from its recent high of 60 thousand t in 2011, it is 30% higher than the 2006-2010 average. The products made from GOA Pacific cod had a first-wholesale value was \$103 million in 2015, which was down from \$118 million in 2014 and above the 2006-2010 average of \$190 million. The higher revenue in recent years is largely the result of increased catch and production levels as the average first-wholesale price of Pacific cod products have declined in recent years.

Almost all of the GOA Pacific cod is caught by CVs which make deliveries to shore-based processors and account for 90% of the total GOA Pacific cod catch. Approximately 40% is caught by the trawl, 40% is caught by pot gear, and 20% caught by hook and line, though the number of hook and line vessels is far greater. Production of P. cod in the GOA is relatively balanced between fillets which are typically about 50% of the value, and head and gut (H&G) which are typically 35% of the value. This product mix can vary year to year depending on prices and market conditions.

State-managed fisheries: As noted in Section 3.1, 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 2017 GHs (including the upper range of the Southeast Alaska GHR) is 45,569 tons, with about 1/3 of this being in the BSAI/Dutch Harbor subdistrict. Total state-waters Pacific cod catch in 2015 was estimated to be just over 31,000 tons, broken down by area as follows: in the Kodiak, Chignik and South Alaska Peninsula 5,497 mt, 4,649 mt and 10,826 mt respectively. 8,000 tons in the Dutch Harbor district. 1509 and 104 tons were taken in the Prince William Sound and Cook Inlet fisheries and 424 tons were taken in state waters in Southeast Alaska. The 2015 total state-waters Pacific cod catch in the Aleutian Islands District, as noted by ADFG, is confidential due to limited participation. Estimates of the 2014 sport harvest of Pacific cod from the statewide harvest survey, were 20,323 fish in Southeast and 40,381 fish in Southcentral Alaska. The estimated annual harvests for the prior five-year period (2009-2013) averaged about 11,000 fish in Southeast Alaska and 29,000 fish in Southcentral Alaska⁷.

⁷ http://www.psmfc.org/tsc2/2016/2016TSC_FINAL.pdf

3.1c 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;

Fishery overview

EBS: There is a detailed description of the recent fishery in the 2016 EBS cod Stock Assessment and Fishery Evaluation (SAFE) by Thompson. Much of the following section and related figures are from that report:

During the early 1960s, a Japanese longline fishery harvested EBS P. cod for the frozen fish market. Beginning in 1964, the Japanese trawl fishery for pollock 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. Since then, catches have ranged from about 130,000 tons to 240,000 tons, and have been at the high end of that range since 2012 (Table 3.1.1). Catches taken in the state-water fisheries are included in the EBS totals for assessment purposes.

Table 3.1.1. Summary of 1991-2016 catches (t) of Pacific cod in the EBS by gear type. 2016 catches up to Sep 25. (Source – Table 2.1c from Thompson 2016 EBS P.cod SAFE)

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	108,764	19,957	175,438
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	41,298	81,848	19,723	142,869
2011	64,086	117,066	28,063	209,215
2012	75,534	128,513	28,737	232,784
2013	81,615	124,814	30,261	236,691
2014	72,260	127,311	39,193	238,763
2015	66,677	128,218	37,938	232,832
2016	69,786	98,691	39,314	207,791

Presently, the P. cod stock is exploited by multiple gears, 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 1992). The breakdown of catch by gear during the most recent complete five-year period (2011-2015) is as follows: longline gear accounted for an average of 54% of the catch, trawl gear accounted for an average of 31%, and pot gear accounted for an average of 14%. In the EBS, P. cod are caught throughout much of the continental shelf, with NMFS statistical areas 509, 513, 517, 519, and 521 each accounting for at least 5% of the average catch over the most recent 5-year period (2011-2015). Fig. 3.1.5 shows a comparison of the 2015 and 2016 fisheries for EBS cod, by gear type.

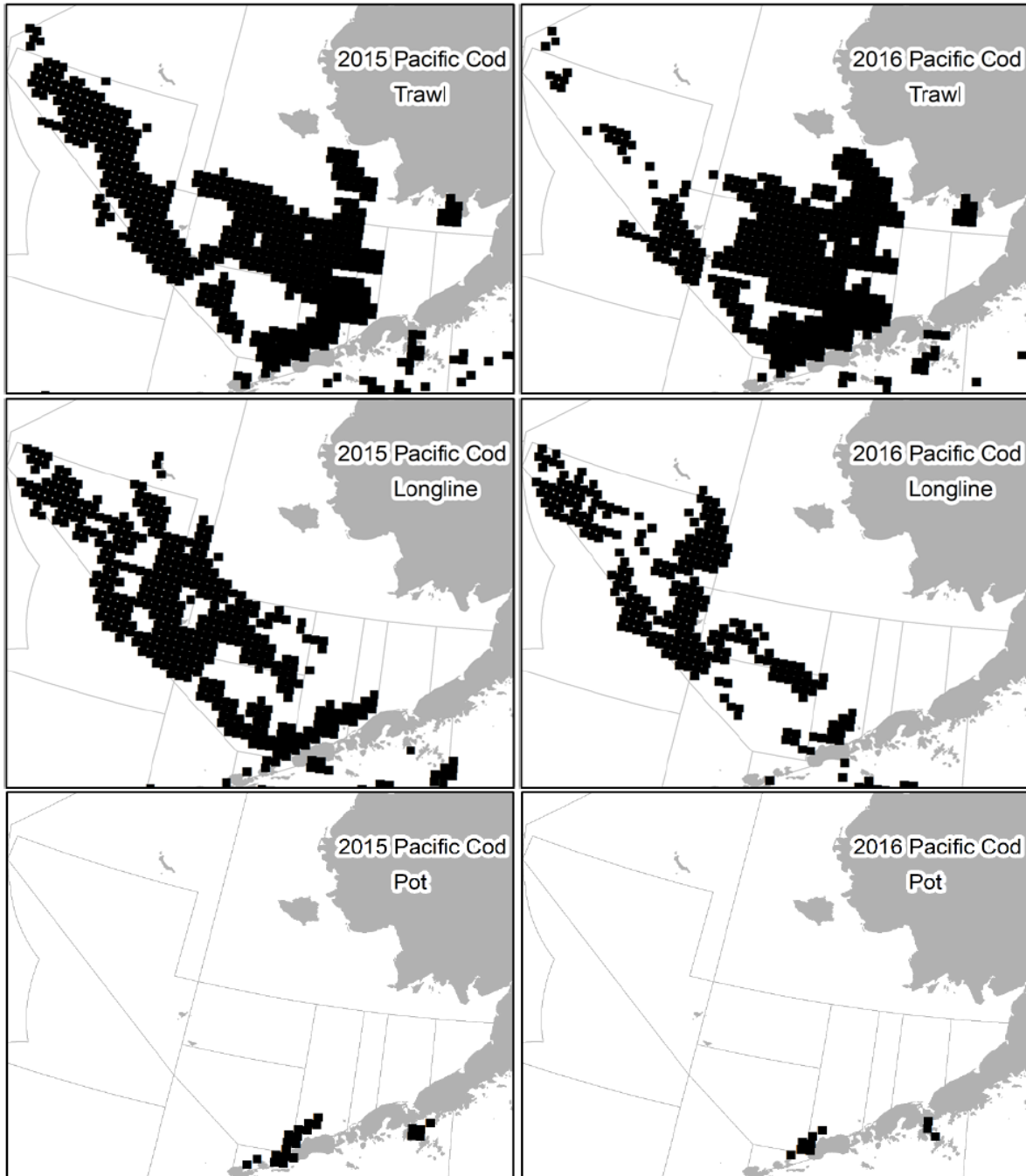


Figure 3.1.5. Maps showing each 400 km² cell with sets/hauls containing Pacific cod from at least 3 distinct vessels in 2015-2016, overlaid against NMFS 3-digit statistical areas. (Source: Fig. 2.2 from Thompson 2016 EBS P. cod SAFE).

Discard rates of cod (Table 3.1.2) have been below 3% since Amendment 49 was introduced in 1998, which required improved retention and utilization. Main bycatches of FMP species are pollock and flatfishes, for trawl, longline, and pot (Table 3.1.3) as per Thompson 2015 EBS cod SAFE. Bycatches of prohibited

species are relatively low, with the exception of halibut, where recent catches have been in the range of 5 to 7 thousand tons (Table 3.1.4). Because all halibut are released live, the observer-based mortality estimates are only about 15% of the total catch weight. Other bycatches include sculpins, octopus, and various species of skate, with totals for the skate species in the range of 15 to 20 thousand tons in recent years, and representing the largest bycatches by weight. Most of the skate bycatch occurs in the longline fishery. It should be noted that updated bycatch information was presented in the 2016 SAFE, but in a different format, showing the bycatches taken in the EBS cod fisheries, by species, as proportions of the bycatch in all FMP fisheries in EBS.

Table 3.1.2. Discards (t) and discard rates (%) of Pacific cod in the Pacific cod fishery, by area, gear, and year for the period 1991-2016 (2016 data are through September 25). (Source Table 2.2 from Thompson 2016 EBS cod SAFE).

Year	Discard amount (t)				Discard rate (%)			
	Trawl	Longline	Pot	Total	Trawl	Longline	Pot	All
1991	1,278	1,493	4	2,774	4.11	2.62	0.26	3.10
1992	3,314	1,768	59	5,141	8.68	2.23	0.78	4.12
1993	5,449	2,234	25	7,708	12.89	4.54	1.21	8.24
1994	4,599	2,917	161	7,677	9.98	3.71	2.01	5.79
1995	7,987	3,669	222	11,877	12.24	3.77	1.15	6.54
1996	2,971	2,833	391	6,194	5.12	3.19	1.39	3.54
1997	3,327	3,183	79	6,590	5.42	2.72	0.37	3.30
1998	102	2,456	52	2,610	0.27	2.92	0.39	1.94
1999	353	1,285	52	1,691	0.95	1.58	0.42	1.29
2000	207	2,267	71	2,546	0.56	2.78	0.45	1.90
2001	142	1,531	52	1,726	0.76	1.70	0.32	1.38
2002	557	2,066	91	2,715	1.73	2.06	0.61	1.84
2003	240	1,771	159	2,170	0.79	1.63	0.80	1.36
2004	158	1,814	48	2,019	0.41	1.67	0.28	1.23
2005	86	2,599	61	2,747	0.26	2.30	0.36	1.68
2006	193	1,528	63	1,784	0.54	1.58	0.33	1.18
2007	238	1,373	45	1,656	0.74	1.78	0.26	1.31
2008	13	1,280	156	1,449	0.09	1.44	0.90	1.20
2009	126	1,503	16	1,645	1.02	1.56	0.12	1.34
2010	154	1,402	19	1,575	1.08	1.72	0.10	1.36
2011	121	1,860	32	2,013	0.42	1.59	0.11	1.16
2012	136	1,759	40	1,934	0.38	1.37	0.14	1.01
2013	220	3,066	90	3,376	0.58	2.46	0.30	1.75
2014	192	2,893	155	3,240	0.50	2.28	0.40	1.58
2015	141	2,374	104	2,618	0.43	1.85	0.27	1.32
2016	117	2,029	60	2,206	0.29	2.06	0.15	1.24

Table 3.1.3. Incidental catch (t) of FMP species, taken in the Bering Sea fisheries for P. cod in 2004-2015. Trawl (upper panel), longline (middle) and pot fishery (bottom panel). (Source Table 2.36 from Thompson 2015 EBS cod SAFE)⁸

⁸ EBS cod SAFE <https://www.afsc.noaa.gov/REFM/Docs/2015/EBSpcod.pdf>

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pollock	5309	4172	3041	3372	5234	4529	4166	5458	4821	5103	5979	4317
Sablefish	19	22	22	14	4	2	2	16	3	3	3	2
Atka Mackerel	25	5	0	4	1	0	1	6	3	2	3	2
Alaska Plaice	0	0	4	0	0	0	0	0	0	1	1	0
Arrowtooth Flounder	1365	1675	1323	1265	1208	1220	1100	956	960	580	545	391
Flathead Sole	593	619	539	352	334	248	264	330	291	372	560	376
Flounder												
Greenland Turbot	218	169	65	115	72	79	106	172	121	16	16	19
Rock Sole	37	48	22	14	20	25	5	20	26	33	52	44
Yellowfin Sole	616	717	485	264	507	653	198	674	1001	1422	1861	1541
Other Flatfish	187	253	145	59	29	56	96	50	64	10	36	35
Northern Rockfish	5	6	6	5	4	4	11	13	9	18	32	22
Pacific Ocean Perch	3	1	0	0	0	1	1	2	1	2	6	4
Rougheye Rockfish	1	4	2	2	5	1	4	3	2	2	2	4
Sharpchin/Northern Rockfish												
Short/Rough/Sharp/Northern												
Shortraker Rockfish	25	19	10	22	12	22	48	20	14	8	13	22
Shortraker/Rougheye Rockfish												
Other Rockfish	28	20	10	22	18	7	47	36	23	28	46	34
Other	17848	19934	14230	11244	14331	12464	11043					

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pollock	13332	9923	12098	16936	4289	3329	2237	3500	3512	3986	5513	2061
Sablefish	73	28	2	1	1					0		0
Atka Mackerel	4442	652	367	123	10	28	46	69	35	10	2	10
Alaska Plaice	373	391	342	404	54	55	73	523	160	577	623	153
Arrowtooth Flounder	7861	3786	4285	1924	584	448	415	219	217	275	221	222
Flathead Sole	2818	1351	2896	3750	360	479	165	220	242	241	220	118
Flounder												
Greenland Turbot	76	10	20	82	8	1	5	0	1	2	2	1
Rock Sole	8669	7464	4533	3867	974	750	842	1336	1134	830	1363	1656
Yellowfin Sole	1842	1267	1426	645	322	306	471	1208	735	2663	1504	566
Other Flatfish	2064	1332	600	383	76	28	62	73	73	29	48	131
Northern Rockfish	51	22	48	4	1	1	3	6	5	0	1	3
Pacific Ocean Perch	64	80	50	25	2	1	0	4	2	2		5
Rougheye Rockfish	1	1										
Sharpchin/Northern Rockfish												
Short/Rough/Sharp/Northern												
Shortraker Rockfish												
Shortraker/Rougheye Rockfish												
Other Rockfish	63	18	12	5	5	2	8	2	16	2	2	5
Other	3178	1694	2592	3805	741	543	511					

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pollock	9	8	26	12	11	17	8	7	4	7	16	25
Sablefish	1	0	3							0		
Atka Mackerel	141	236	330	41	61	2	27	29	9	3	7	4
Alaska Plaice									0			
Arrowtooth Flounder	4	5	13	3	6	0	1	1	1	2	1	0
Flathead Sole	1	1	0	2	1	0	0	0	0	0	0	0
Flounder												
Greenland Turbot			1					0				
Rock Sole	2	1	2	3	1	0	1	0	1	1	2	0
Yellowfin Sole	78	76	47	206	133	35	2	29	29	298	352	187
Other Flatfish	1	1	1	1	0	0	0	0	0	2	0	0
Northern Rockfish	1	1	1	1	2	0	0	1	1	0	0	1
Pacific Ocean Perch	0	0	1		0	0	0	0	0	0		
Rougheye Rockfish	0	0										
Sharpchin/Northern Rockfish												
Short/Rough/Sharp/Northern												
Shortraker Rockfish							0					
Shortraker/Rougheye Rockfish												
Other Rockfish	3	3	4	1	1	0	2	2	1	5	4	3
Other	333	360	471	305	383	131	247					

Table 3.1.4. Catches of prohibited species by Bering Sea fisheries for Pacific cod, 1991-2015 (2015 data are through October 13). Herring and halibut catches (and halibut mortality totals) are in t, salmon and crab are in 1000s of individuals. (Source Table 2.38 from Thompson 2015 EBS cod SAFE).

Species/group	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bairdi Tanner Crab	764	439	230	319	330	455	293	152	158	180	155	355	261
Opilio Tanner (Snow) Crab	212	308	291	440	277	377	1019	803	540	404	251	508	217
Red King Crab	52	13	2	2	8	79	28	12	17	44	21	40	14
Blue King Crab													4
Golden (Brown) King Crab													0
Other King Crab	1	13	1	3	2	7	3	25	12	9	18	27	
Herring		8	23	2	8	18	1	1	1	1	5	3	14
Chinook Salmon	4	5	6	7	7	6	5	2	2	1	3	2	2
Non-Chinook Salmon	0	0	0	1	1	0	0	1	0	0	2	1	1

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bairdi Tanner Crab	274	336	491	819	1265	528	389	324	115	238	553	501
Opilio Tanner (Snow) Crab	285	281	475	1812	693	550	782	188	48	42	112	128
Red King Crab	14	20	18	47	36	8	3	23	11	99	142	54
Blue King Crab	3	1	4	173	9	15	123	1	1	0	0	0
Golden (Brown) King Crab	0	0	0	0	0	1	0	0	0	0	0	0
Other King Crab												
Herring	9	18	8	2	0	0	0	0	6	0	1	3
Chinook Salmon	5	3	3	5	1	0	0	0	1	1	1	1
Non-Chinook Salmon	7	1	7	1	0	0	0	0	0	0	1	0

Halibut quantity	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Catch	5198	7256	3463	8657	8950	9175	8640	7234	6136	7273	6221	7329	6699
Mortality				2069	2264	2326	2060	1719	1780	1537	1278	1789	1875

Halibut quantity	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Catch	6716	7524	5904	5316	5828	5422	5464	5701	6567	6179	5293	2892
Mortality	2077	1977	1786	1419	902	782	784	781	1039	863	751	496

An extensive report is produced each year on the Alaskan observer program, which covers fisheries in the Bering Sea and Aleutian Islands areas, as well as the GOA Regions⁹. From the report on the 2016 observer program, observer coverage in the BSAI cod fisheries by catcher/processors, and catcher vessels delivering to motherships was at 100%, for all 3 major gear types. For catcher vessels delivering shoreside in 2016, about 50% of P. cod caught by non-pelagic trawls was observed, and about 15% of P. cod taken by pots was observed. Data gathered in the observer program include catch weights (retained and discarded), species composition, length, sex and age; and interactions with species such as sharks, rays, seabirds, marine mammals and other species with limited or no commercial value. For halibut, viability (injury and condition) data are collected by observers to generate halibut discard mortality rates (DMR) in Alaskan groundfish fisheries¹⁰. 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 and can be used as the basis to trigger closures e.g. if Prohibited Species Catch (PSC) limits are exceeded. An electronic monitoring program available to certain vessels has also been introduced in recent years. Additional information on the Observer Program is contained in Section 3.6.5 below.

The Western Alaska Community Development Quota (CDQ¹¹) Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of high capital investment needed to enter the fishery. The Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities and the current allocation is 10% of the BSAI P. cod TAC.

GOA:

There is a detailed description of the recent fishery in the 2016 GOA cod Stock Assessment and Fishery Evaluation (SAFE) by Barbeaux et al. Much of the following section is from that report.

During the two decades prior to passage of the Magnuson Fishery Conservation and Management Act (MFCMA) 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

⁹ <https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf>

¹⁰ <http://npfmc.legistar.com/gateway.aspx?M=F&ID=34847078-2ed2-4d3c-85a5-73e26235c1d5.pdf>

¹¹ <http://www.npfmc.org/community-development-program/>

usually incidental to directed fisheries for other species. By 1976, catches had increased to 6,800 t. Catches of Pacific cod since 1991 have ranged between 47 thousand and 85 thousand tons, including the state-waters catches, and are shown in Table 3.1.5. Presently, the Pacific cod stock is exploited by trawl, longline, pot, and jig fisheries. 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 (not counting 2016, for which data are not yet complete). In recent years, about 90% of P. cod caught in the six state-managed P. cod fisheries in the GOA Region have been prosecuted by pots. Total state catches in GOA have been around 25% of the overall total in recent years, which reflects the percentage used to set the P. cod GHL for most state-managed areas.

Table 3.1.5 Catches (t) of cod in Gulf of Alaska, by gear, from 1991 to 2016 (2016 as of Oct 28). (Source: Table 2.1 from Barbeaux et al. 2016 GOA cod SAFE).

Year	Federal					State				Total
	Trawl	Longline	Pot	Other	Subtotal	Longline	Pot	Other	Subtotal	
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	9,470	12,761	161	41,276		7,943	3,241	11,185	52,461
2004	17,512	10,325	14,965	400	43,202		10,602	2,765	13,367	56,569
2005	14,549	5,731	14,749	203	35,232		9,634	2,673	12,306	47,538
2006	13,132	10,236	14,540	118	38,025		9,135	662	9,796	47,822
2007	14,775	11,514	13,573	44	39,906		11,308	681	11,988	51,895
2008	20,293	12,078	11,229	63	43,664		13,438	1,564	15,002	58,666
2009	13,976	13,885	11,951	206	40,017	196	9,919	2,500	12,616	52,633
2010	21,764	16,493	20,114	429	58,801	174	14,603	4,045	18,822	77,623
2011	16,452	16,372	29,231	722	62,777	306	16,675	4,627	21,608	84,385
2012	20,070	14,319	21,237	722	56,348	295	15,939	4,612	20,846	77,195
2013	21,700	12,575	17,011	475	51,761	176	14,153	1,303	15,633	67,394
2014	26,794	14,410	19,956	1,046	62,206	198	18,445	2,838	21,481	83,687
2015	22,260	11,942	20,650	409	55,261	3	19,717	2,790	22,510	77,771
2016	15,018	7,190	15,730	319	38,256	129	18,765	1,696	20,590	58,846

In order to accommodate the State-managed fishery, as pointed out by the SAFE authors, the Federal TAC was set well below ABC (15-25% lower) since 1997. Thus, although total (Federal plus State) catch has exceeded the Federal TAC in all but three years since 1997, this is basically an artifact of the bi-jurisdictional nature of the fishery and is not evidence of overfishing. Since the separate State waters fishery began in 1997 total catch has not exceeded ABC, and total catch has never exceeded OFL.

Discards of cod in the GOA fisheries are generally low, having decreased in 2015-16 following an increase in 2013-14 (Table 3.1.6). The most common species in the incidental catch are pollock, various skates, sculpins, sea stars, and several flatfish species, including arrowtooth flounder (Table 3.1.7). There was an increase in the amount of Pacific ocean perch taken as bycatch, and mostly discarded, in 2016. Bycatch of prohibited species catch (PSC) include halibut, various crab species, as well as Chinook salmon. In 2015, the non-pollock non-rockfish program catcher vessels in GOA exceeded the 2700 Chinook limit by 174 fish¹² before May, resulting in closures¹³ affecting primarily P. cod and flatfish fisheries in Central and Western GOA. Following a Regulatory Impact Review by NMFS, the fisheries reopened in August of 2015, under a PSC limit of 1600 Chinook, and NMFS data indicates only 4 fish of this limit were caught through

¹² Chinook data 2015 https://alaskafisheries.noaa.gov/sites/default/files/reports/car142_goa_salmon2015.pdf

¹³ NOAA notice of fishery closure. <https://alaskafisheries.noaa.gov/node/28259>

the end of the fishery on Dec. 31, 2015. Chinook catches by this fleet sector were reduced considerably in 2016¹⁴, and no additional management measures were required. The majority of chinook by-catch in GOA is from the pollock fishery, and a recent supplementary Biological Opinion concluded that groundfish fisheries in the GOA were not likely to jeopardize the continued existence of threatened Chinook stocks¹⁵ (NMFS 2012). Amendment 103 to the GOA FMP, passed in September 2016¹⁶, allows NMFS to reapportion unused Chinook salmon prohibited species catch (PSC) within and among specific trawl sectors in the Central and Western Gulf of Alaska (GOA), based on specific criteria and within specified limits. This rule does not increase the current combined annual PSC limit of 32,500 Chinook salmon that applies to Central and Western GOA trawl sectors, and promotes more flexible management of GOA trawl Chinook salmon PSC. NPFMC are considering additional management measures to address the Chinook limits for some GOA fisheries.

Table 3.1.6. Estimated retained-and discarded GOA Pacific cod from federal waters (*as of 2016-10-28). (Source: Table 2.4 from Barbeaux et al. 2016 GOA P. cod SAFE).

Year	Discarded	Retained	Grand Total
1991	1,429	74,899	76,328
1992	3,873	76,199	80,073
1993	5,844	49,865	55,709
1994	3,109	43,540	46,649
1995	3,525	64,560	68,085
1996	7,534	60,530	68,064
1997	4,783	63,057	67,840
1998	1,709	59,811	61,520
1999	1,617	66,311	67,928
2000	1,362	52,904	54,266
2001	1,901	39,632	41,533
2002	3,713	38,594	42,307
2003	2,414	50,047	52,461
2004	1,265	55,304	56,569
2005	1,039	46,499	47,538
2006	1,835	45,986	47,822
2007	1,438	50,456	51,895
2008	3,299	55,367	58,666
2009	3,877	48,756	52,633
2010	2,833	74,790	77,623
2011	2,048	82,336	84,385
2012	962	76,233	77,195
2013	4,480	62,914	67,394
2014	5,177	78,511	83,687
2015	1,672	76,098	77,771
2016*	798	58,048	58,846

Table 3.1.7 Groundfish bycatch (t), discarded and retained, for 2012 – 2016 (2016 to Oct 28) for fisheries with GOA P. cod as target species. (Source: Table 2.5 from Barbeaux et al. 2016 GOA P. cod SAFE).

¹⁴ Chinook data 2016 https://alaskafisheries.noaa.gov/sites/default/files/reports/car142_goa_salmon2016.pdf

¹⁵ NMFS 2012. Supplemental Biological Opinion

¹⁶ Amendment 103 to GOA FMP . <https://alaskafisheries.noaa.gov/sites/default/files/81fr62659.pdf>

	2012		2013		2014		2015		2016	
	D	R	D	R	D	R	D	R		
Arrowtooth Flounder	330.0	498.9	862.8	575.9	817.7	499.2	447.6	659.4	602.8	793.9
Atka Mackerel	12.4	1.9	21.4	0.1	7.4	0.3	146.1	10.6	27.7	7.8
Flathead Sole	51.8	157.5	248.3	178.5	119.3	180.4	97.5	241.4	76.1	244.0
GOA Deep Water Flatfish	0.3	3.1	18.4	5.6	0.9	9.1	25.4	14.9	21.8	3.6
GOA Demersal Shelf Rockfish						0.0				
GOA Dusky Rockfish	23.1	9.4	17.5	6.4	10.1	39.2	11.0	16.4	50.9	19.0
GOA Rex Sole	27.8	109.9	17.5	95.1	12.0	72.7	7.9	112.8	22.9	146.7
GOA Rougheye Rockfish	0.4	3.2	0.4	1.1	1.2	3.0	0.1	3.4	0.8	1.9
GOA Shallow Water Flatfish	125.0	686.4	173.5	792.0	320.8	595.0	297.9	714.9	178.5	535.0
GOA Shortraker Rockfish	2.0	1.6	1.3	2.8	3.0	1.3	0.2	2.8	0.8	1.0
GOA Skate, Big	81.1	654.0	211.6	399.4	659.8	179.9	568.7	202.8	355.0	248.4
GOA Skate, Longnose	9.3	297.3	82.3	265.9	93.6	321.1	147.7	465.1	308.0	151.5
GOA Skate, Other	566.4	119.2	794.4	11.0	876.5	58.9	994.3	81.4	821.0	68.5
GOA Thornyhead Rockfish	0.3	2.6	4.7	3.2	2.6	16.1	4.9	4.2	1.6	8.5
Halibut			0.0	25.6	4.9	29.9	28.1	35.0	5.4	15.4
Northern Rockfish	26.8	24.0	48.1	61.9	12.7	58.7	12.1	35.1	74.1	16.8
Octopus	134.9	273.1	108.5	211.7	673.2	511.0	524.9	376.2	139.8	141.0
Other Rockfish	6.9	29.4	27.5	19.3	28.0	16.5	21.2	47.8	32.6	33.2
Pacific Ocean Perch	7.5	45.9	7.0	5.3	0.4	14.4	104.1	62.2	1344.6	15.5
Pollock	698.6	967.8	104.7	749.7	86.9	1422.4	108.4	1002.4	54.5	327.8
Sablefish	0.4	23.1	30.8	15.5	11.6	44.8	39.2	35.9	80.6	31.8
Sculpin	406.5	42.2	472.7	4.7	534.4	6.9	628.6	3.5	789.2	11.4
Shark	18.7	0.6	59.3	0.1	376.7	0.5	129.0	0.3	410.2	0.2
Squid		0.0	0.1	0.8		0.0	0.2	1.2	0.0	0.6
Grand Total	2530.1	3951.1	3312.8	3431.6	4653.6	4081.3	4345.2	4129.5	5398.8	2823.3

Historically, the majority of the GOA catch has come from the Central regulatory area, although the distribution of effort within the GOA is driven somewhat by regulation, as catch limits within this region have been apportioned by area (Western, Central, Eastern GOA – see Fig. 3.1.3). Changes in area-specific allocation between years have usually been traceable to changes in biomass distributions estimated by AFSC trawl surveys, or in some cases by management responses to local concerns. Currently the area-specific ABC allocation is derived from a random effects model applied to the trawl survey biomass estimates through 2015. Following this method, Central Area receives about 50% of the GOA P. cod allocation in 2017 and 2018. (Text table from Barbeaux et al. 2016 GOA P. cod SAFE).

	Western	Central	Eastern	Total
Random effects area apportionment (percent)	41.08	50.01	8.91	100.00
2017 ABC	36,291	44,180	7,871	88,342
2018 ABC	32,565	39,644	7,063	79,272

Fig. 3.1.6 shows the distribution of the fishery for P. cod in GOA in 2015. A substantial portion of the catch was taken in the area around Kodiak Island.

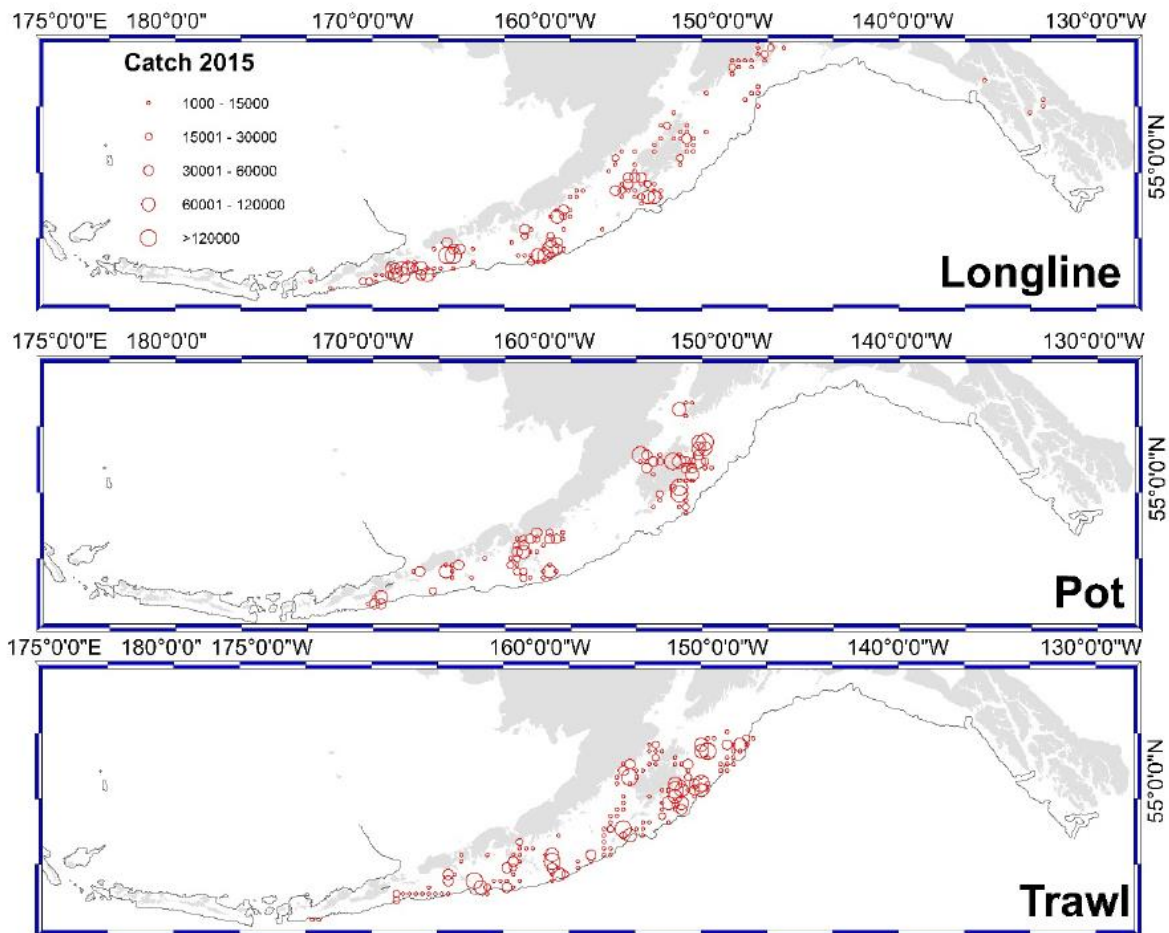


Fig. 3.1.6. Commercial catch of Pacific cod in the Gulf of Alaska by 20km² grid for 2015. (Source: Fig. 2.4 from Barbeaux et al. 2016 GOA cod SAFE).

An extensive report is produced each year on the Alaskan observer program, which covers fisheries in the BSAI and GOA Regions¹⁷. From the report on the 2016 observer program, observer coverage in the GOA cod fisheries by catcher/processors was at 100%, for the only two gears involved (longline and trawl). For catcher vessels in 2016, the observed percentages of cod catch were 7% in longline, 12% for pots, and 14% in trawls. Data gathered in the observer program include catch weights (retained and discarded), species composition, length, sex and age; and interactions with species such as sharks, rays, seabirds, marine mammals and other species with limited or no commercial value. For halibut, viability (injury and condition) data are collected by observers to generate halibut discard mortality rates (DMR) in Alaskan groundfish fisheries¹⁸. 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 and can be used as the basis to trigger closures e.g. if Prohibited Species Catch (PSC) limits, such as Chinook salmon, are exceeded. An electronic monitoring program available to certain vessels has also been introduced in recent years.

Aleutian Islands: There is a detailed description of the recent fishery in the 2016 AI cod Stock Assessment and Fishery Evaluation (SAFE) by Thompson and Palsson. 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 particularly large, and by the time that the MFCMA went into effect in 1977, foreign catches of Pacific cod in the AI had never exceeded 4,200 t. 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

¹⁷ <https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf>

¹⁸ DMR WG Report <http://nfmcc.legistar.com/gateway.aspx?M=F&ID=34847078-2ed2-4d3c-85a5-73e26235c1d5.pdf>

in 1986, followed by an end to joint venture fishing in 1990. Domestic fishing for AI Pacific cod began in 1981, with a peak catch of over 43,000 t in 1992. After 2010, catches have not exceeded 19,000 tons in any one year (Table 3.1.8).

Table 3.1.8. Catches (t) of *P. cod* in the AI. To avoid confidentiality problems, longline and pot catches have been combined. 2016 data through October 23. (Source: Table 2A.1c from Thompson and Palsson 2016 AI cod SAFE).

Year	Federal			State	Total
	Trawl	LL+pot	Subtotal	Subtotal	
1991	3,414	6,383	9,798		9,798
1992	14,587	28,481	43,068		43,068
1993	17,328	16,876	34,205		34,205
1994	14,383	7,156	21,539		21,539
1995	10,574	5,960	16,534		16,534
1996	21,179	10,430	31,609		31,609
1997	17,411	7,753	25,164		25,164
1998	20,531	14,196	34,726		34,726
1999	16,478	11,653	28,130		28,130
2000	20,379	19,306	39,685		39,685
2001	15,836	18,372	34,207		34,207
2002	27,929	2,872	30,801		30,801
2003	31,478	978	32,457		32,457
2004	25,770	3,103	28,873		28,873
2005	19,624	3,069	22,694		22,694
2006	16,956	3,535	20,490	3,721	24,211
2007	25,714	4,495	30,208	4,146	34,355
2008	19,404	7,506	26,910	4,319	31,229
2009	20,277	6,245	26,522	2,060	28,582
2010	16,759	8,277	25,036	3,967	29,003
2011	9,359	1,233	10,592	266	10,858
2012	9,786	3,201	12,988	5,232	18,220
2013	7,001	1,789	8,790	4,793	13,583
2014	5,715	426	6,141	4,451	10,592
2015	5,968	3,096	9,064	161	9,225
2016	10,594	1,690	12,284	882	13,165

Presently, *P. cod* in AI is exploited by a multiple-gear fishery, including primarily trawl and longline components. Pot gear also accounted for some of the catch through 2014 (averaging 8% of the total from 1991-2014), but there have not been any catches by pot gear since then. Jig gear also contributes a small amount of catch, averaging less than 24 t/year since 1991. Catcher and catcher/processor vessels are used. In 2015 trawl gear took 66% of the catch, and longline gear accounted for 34%. Historically, *P. cod* were caught throughout the AI. For the last five years prior to enactment of additional Steller sea lion protective regulations in 2011, the proportions of *P. cod* catch in statistical areas 541 (Eastern AI), 542 (Central AI), and 543 (Western AI) averaged 58%, 19%, and 23%, respectively (see Fig. 3.1.3 for area map). For the period 2011-2014, the average distribution in these 3 zones was 84%, 16%, and 0%, respectively. In 2015, area 543 was reopened to limited fishing for *P. cod* and the average catch distribution for 2015-2016 (through October 23, 2016) was 54%, 19%, and 27%, for East, Central, and West respectively. In the AI, both longline and trawl effort occurred over a wide area along the shelf edge. Catches of *P. cod* from fisheries in state waters of AI have varied considerably in recent years, ranging from 161 t in 2015 to 5232 t in 2012 (Table 3.1.8).

Discard rates of *P. cod* in the *P. cod* fisheries in AI are low, and have been at 1.5 % or less since 2003, and less than 1% in 2014-2016. Main bycatches are skate, sculpins, flatfishes, and rockfish (Tables 3.1.9 and 3.1.10). Bycatches of prohibited species are relatively low, consisting mainly of halibut and a few crab. Halibut mortality in the *P. cod* fisheries in AI is estimated to be around 25 t in recent years.

Observer coverage is present in the AI fisheries for P. cod, and the section on observers from the EBS cod fishery above applies to both BS and AI cod fisheries. The CDQ program described above is also an important consideration for fisheries and communities in the AI Region.

Table 3.1.9. Incidental catch (t) of FMP species taken in the AI trawl (upper panel) and longline + pot (lower panel) fisheries for P.cod, 1991-2015 (2015 data to October 18). (Source: Tables 2A.25a,b from Thompson and Palsson 2015 AI cod SAFE).

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pollock	537	669	314	395	54	51	18	57	78	23	11	
Sablefish	1	0	1	1								
Atka Mackerel	549	482	447	361	456	359	124	101	384			
Alaska Plaice				0	0							
Arrowtooth Flounder	199	244	206	134	24	35	35	16	19	18	5	
Flathead Sole	34	24	33	22	10	14	17	3	9	5	2	
Flounder												
Greenland Turbot	6	5		7	1	1						
Rock Sole	699	437	449	585	258	432	427	196	217	146	101	
Yellowfin Sole	9		3	0	0							
Other Flatfish	10	6	11	9	13	3	2	0	7	3	8	
Northern Rockfish	129	210	185	89	51	59	29	21	9	11	14	
Pacific Ocean Perch	160	180	134	96	105	32	5	2	43	3	1	
Rougheye Rockfish	2	3	1	0	0		0	1				
Sharpchin/Northern Rockfish												
Short/Rough/Sharp/Northern												
Shortraker Rockfish	3		2	0								
Shortraker/Rougheye Rockfish												
Other Rockfish	12	8	7	9	9	7	4	4	9	3	1	
Other	305	181	279	325	139	168	93					

Species/group	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pollock	15	3	8	6	9	29	47	6	8	0		5
Sablefish	2		37	22	23	3	30	6	15	1		
Atka Mackerel	12	19	21	25	47	89	93		19	23		10
Alaska plaice												
Arrowtooth Flounder	18	34	36	66	42	45	65	8	10	2		4
Flathead Sole	0	0	1	2	2	3	3		1			
Flounder												
Greenland Turbot	3		11	15	4	5	5	1	2			
Rock Sole	2	4	3	3	2	2	3		2	0		1
Yellowfin Sole												
Other Flatfish	10		0	0	1	16	2					
Northern Rockfish	27	19	8	33	54	56	119		12	34		25
Pacific Ocean Perch	0	2	1	4	3	1	1		1			0
Rougheye Rockfish	26	2	3	28	46	23	30		27	15		16
Sharpchin/Northern Rockfish												
Short/Rough/Sharp/Northern												
Shortraker Rockfish	3	6	8	12	6	6	28	2	7	11		3
Shortraker/Rougheye Rockfish												
Other Rockfish	55	12	21	51	45	77	81	14	20	15		24
Other	612	518	577	734	809	1103	1392					

Table 3.1.10. Incidental catch (t) of other species taken in the AI fisheries for P.cod, all gears combined, 1991-2015 (2015 data to October 18). (Source: Table 2A.26 from Thompson and Palsson 2015 AI cod SAFE).

Species/group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Octopus, North Pacific	14	14	12	44	14	13	19	39	10	7	12	4	12
Sculpins	n/a								114	359	272	62	370
Shark, Pacific sleeper	0	2	2	n/a	n/a	n/a	n/a	0				n/a	n/a
Shark, salmon							n/a		n/a				n/a
Shark, spiny dogfish	0	0	0	1	0	3	1	1	0	0	n/a	n/a	0
Shark, other		n/a											
Skate, Alaska								161					
Skate, big		0	n/a	4	0	n/a	0	0					
Skate, longnose		0	n/a	n/a		n/a	0	n/a					
Skate, other	152	335	355	313	333	373	512	463	109	260	134	19	212
Squid, majestic	3	2	1	1	0	0	0	0	0	0	0	0	n/a

3.2 Pacific cod biology

Species biology: There are numerous sources of information on P. cod biology, including the three P. cod SAFE documents for 2016, various primary publications, and other NMFS and ADFG reports. Much of the brief overview that follows in this section has been taken from the Alaska Fisheries Science Center (AFSC) website which provides summaries for P. cod biology and relevant studies under various headings.

Pacific cod (*Gadus macrocephalus*) 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 Gulf of Alaska and 4.9 years in the eastern Bering Sea. P. cod females grow significantly faster in the Bering Sea than in the Gulf of Alaska. Males reach a smaller maximum length in the Gulf of Alaska than females, while in contrast, Bering Sea males reach a similar maximum length as females. Cod begin to recruit to trawl fisheries at age 3, but are not fully recruited to all gear types until about age 7.

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. P. 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 Bering Sea in 2005-2007, most spawning activity was observed on the Bering Sea shelf and Aleutian Island plateaus between 100 and 200 m depth, during late February to mid-April (Neidetcher et al. 2014). Fecundity of P. cod is high and large females produce well in excess of a million eggs each year. Spawning takes place near bottom, eggs sink to the bottom after fertilization and are somewhat adhesive. Optimal temperature for incubation is between 3° and 6°C (Thompson 2016, EBS P. cod SAFE). Little is known about the distribution of P. 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 P. cod, it has been suggested in some studies that Atlantic cod may exhibit increasing natural mortality with age.

3.3 Scientific stock assessment

The assessment models used for the P. cod stocks in Alaska take into account all sources of fishing mortality and are based on complete catch reporting systems including extensive observer data. Catches from fisheries occurring in state-managed waters are included in the appropriate assessments. All retained catch and discards of P. cod are included in the total catch amounts input into the models. The assessments take into account various relevant aspects of P. cod biology. The assessments of GOA and EBS P. 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. The EBS and GOA models

were run with Stock Synthesis version 3.24U (Methot and Wetzel 2013) which is based on the ADMB software package (Fournier et al. 2012). Both EBS and GOA SAFE reports give extensive histories of previous models used in the assessments, as well as numerous models examined in 2016. The AI P. cod assessment relies on survey biomass estimates and a simpler random effects model, although various age-structured models were examined and reported in the 2016 SAFE.

EBS area: Full description of the assessment model formulations, input data, and results can be found in the 2016 EBS P. cod SAFE by Thompson. The summaries, tables, and figures which follow are from that report.

A statistical age-structured stock synthesis assessment model was applied over the period 1977-2016. The model used updated data for 2015-16 where available, and was implemented using ADMB software. The analytical approach involves a combination of independently estimated parameters available from life history studies and numerous parameters estimated conditionally on data and assumptions from the model. In addition to updating/adding data from 2015-16, the 2016 SAFE author noted several modifications and/or improvements in the model accepted in 2016, including different treatment of weight-length data, survey and fishery selectivities (dome-shaped vs asymptotic), and improved retrospective pattern. Most of the modifications to the methods were adopted based on extensive feedback and recommendations from earlier presentations in 2016 to the NPFMC's Plan Team and Scientific and Statistical Committee (SSC). This followed an external CIE review of the EBS Pacific cod assessment conducted during February 2016. Thompson (2016 SAFE) described in detail the approach used to arrive at the final model in 2016, including various preliminary assessment models recommended and considered for inclusion. It was noted in the final model chosen, the 2017 maximum permissible ABC came closest to the average across all models.

The following table from Thompson 2016 EBS P. cod SAFE shows the input data used in at least one of the models:

Source	Type	Years
Fishery	Catch biomass	1977-2016
Fishery	Catch size composition	1977-2016
Fishery	Catch per unit effort	1991-2016
EBS shelf bottom trawl survey	Numerical abundance	1982-2016
EBS shelf bottom trawl survey	Size composition	1982-2016
EBS shelf bottom trawl survey	Age composition	1994-2015
EBS shelf bottom trawl survey	Mean size at age	1994-2015
NMFS longline survey	Relative population number	1997-2015 (odd years only)
NMFS longline survey	Size composition	1997-2015 (odd years only)

EBS Bottom trawl survey: Trawl surveys have been conducted annually by NMFS-AFSC to assess the abundance of crab and groundfish in the Eastern Bering Sea since 1982 using standardized gear and methods on two chartered commercial fishing vessels. For P. cod, this survey provides an important abundance and biomass index as well as information on the population age structure and various biological aspects. Estimates of total biomass and numbers of fish from the trawl survey are shown in Table 3.3.1. Survey results indicate that biomass remained relatively constant from 1982 through 1988, then went through a period of decline then increase in the early 1990's. The highest biomass ever observed by the survey was the 1994 estimate of 1.37 million t. Following the high observation in 1994, the survey biomass estimate declined steadily to the lowest value in 2008 around 403 thousand tons. Estimated biomass more than doubled between 2009 and 2010, followed by another large increase (36%) in 2014, which was sustained through 2015. The 2016 estimate of 944,621 t represented a 14% drop relative to 2015, although it is still 20% above average for the time series.

Table 3.3.1: Total biomass and abundance of P. cod, with standard deviations, as estimated by EBS shelf bottom trawl surveys, 1982-2016. For biomass, 95% confidence intervals are also shown (Source: Table 2.7 from Thompson 2016 EBS P. cod SAFE).

Year	Biomass (t)				Abundance (1000s of fish)	
	Estimate	Std. error	L95% CI	U95% CI	Estimate	Std. error
1982	1,013,061	73,621	867,292	1,158,831	583,781	38,064
1983	1,187,096	120,958	942,640	1,431,553	752,456	80,566
1984	1,013,558	62,513	889,782	1,137,334	651,058	47,126
1985	1,001,112	55,845	890,540	1,111,684	841,108	113,438
1986	1,118,006	69,626	980,146	1,255,866	838,217	83,855
1987	1,027,518	63,670	901,452	1,153,584	677,054	44,120
1988	960,962	76,961	808,579	1,113,344	507,560	35,581
1989	833,473	62,713	709,300	957,645	292,247	19,986
1990	691,256	51,455	589,376	793,136	423,835	36,466
1991	514,407	38,039	439,090	589,725	488,892	51,108
1992	529,049	44,616	440,708	617,390	577,560	68,603
1993	663,308	53,143	558,085	768,531	810,608	99,259
1994	1,360,790	247,737	865,316	1,856,263	1,232,175	152,212
1995	1,002,961	91,622	821,550	1,184,372	757,910	75,473
1996	889,366	87,521	716,076	1,062,657	607,198	88,384
1997	604,439	68,120	468,199	740,678	485,643	70,802
1998	534,150	42,937	449,135	619,165	514,339	46,852
1999	569,765	49,471	471,811	667,718	488,337	45,289
2000	531,171	43,160	445,714	616,627	483,808	44,188
2001	811,816	73,211	665,394	958,239	960,917	91,898
2002	584,565	63,820	456,926	712,205	536,342	53,802
2003	590,973	62,121	466,732	715,214	498,873	62,220
2004	562,309	33,739	495,505	629,113	397,948	34,332
2005	606,050	43,056	520,799	691,301	450,705	63,363
2006	517,698	28,341	461,583	573,813	394,024	23,785
2007	423,704	34,811	354,081	493,326	733,402	195,956
2008	403,125	26,822	350,018	456,232	476,697	49,413
2009	421,291	34,969	352,053	490,530	716,637	62,705
2010	860,210	102,307	657,642	1,062,778	887,836	117,022
2011	896,039	66,843	763,690	1,028,388	836,822	79,207
2012	890,665	100,473	689,718	1,091,612	987,973	91,589
2013	791,958	73,952	644,054	939,862	750,889	124,917
2014	1,079,712	153,299	769,895	1,389,528	1,122,144	143,618
2015	1,102,261	150,981	800,299	1,404,223	982,470	113,501
2016	944,621	76,948	790,725	1,098,516	640,359	61,639

Other survey data: Longline surveys conducted by NMFS and IPHC in the Bering Sea were examined in various model formulations, but were not included in the final accepted model in 2016. The NMFS longline survey has been conducted in odd-numbered years since 1997, and the most recent estimate (2015) of P. cod abundance was 4% above the series mean.

Fishery CPUE: Fig. 3.3.1 shows the time series of CPUE data for P. cod in EBS, from trawl, longline, and pot fisheries. Thompson (2016 SAFE) noted that most trend lines are positive over the last 10 years.

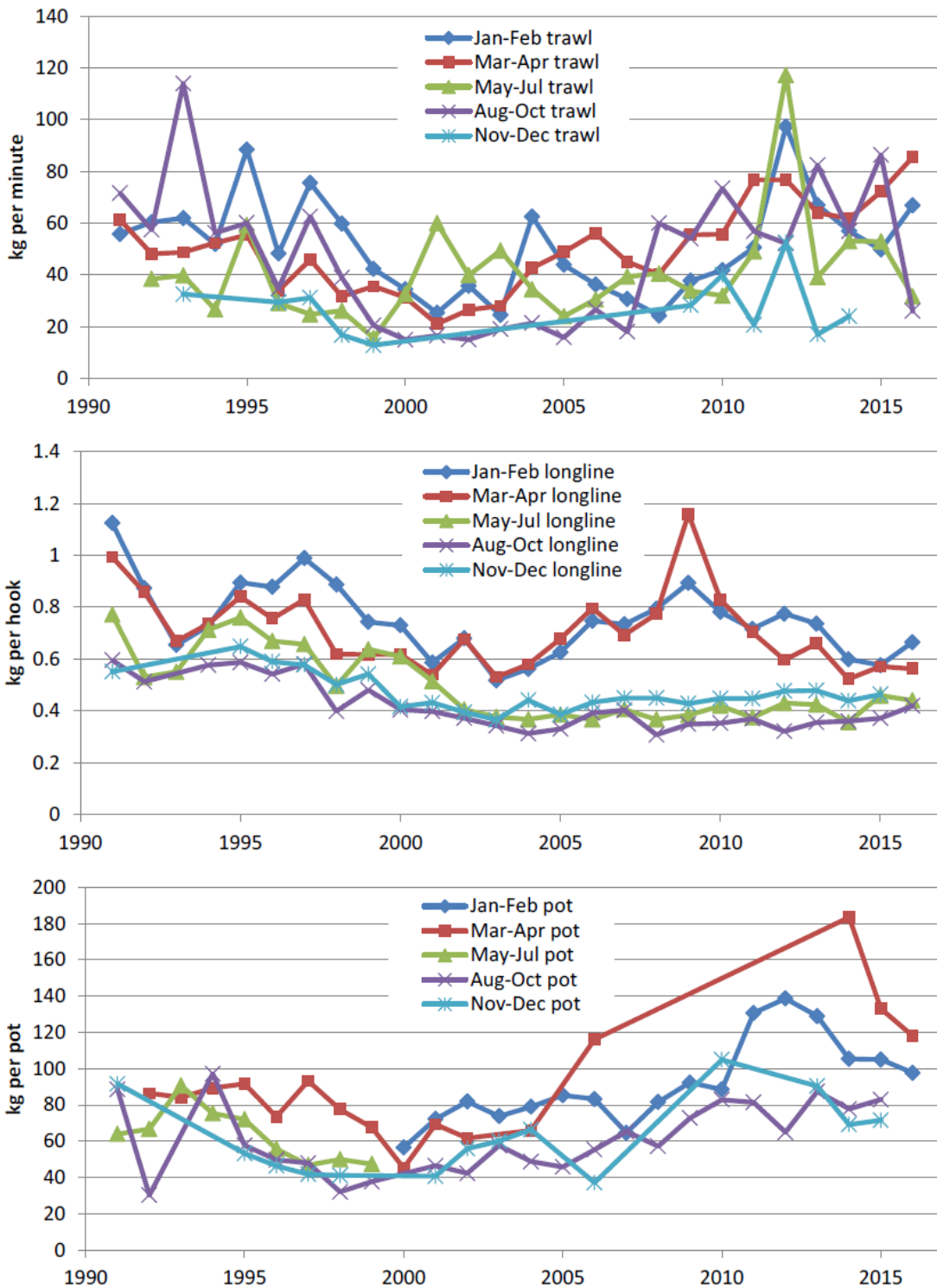


Fig. 3.3.1. The time series of CPUE data for *P. cod* in EBS, from trawl, longline, and pot fisheries. (Source: Thompson 2016 EBS *P. cod* SAFE).

EBS Assessment results:

The age 3+ biomass of *P. cod* shows a peak in the mid-1980s, and an increasing trend since 2010 (Fig. 3.3.2). Projected spawning biomass in 2017 is estimated to be about 327,000 tons, which is about 53% of the B100% value calculated, and above the B35% and B40% reference points.

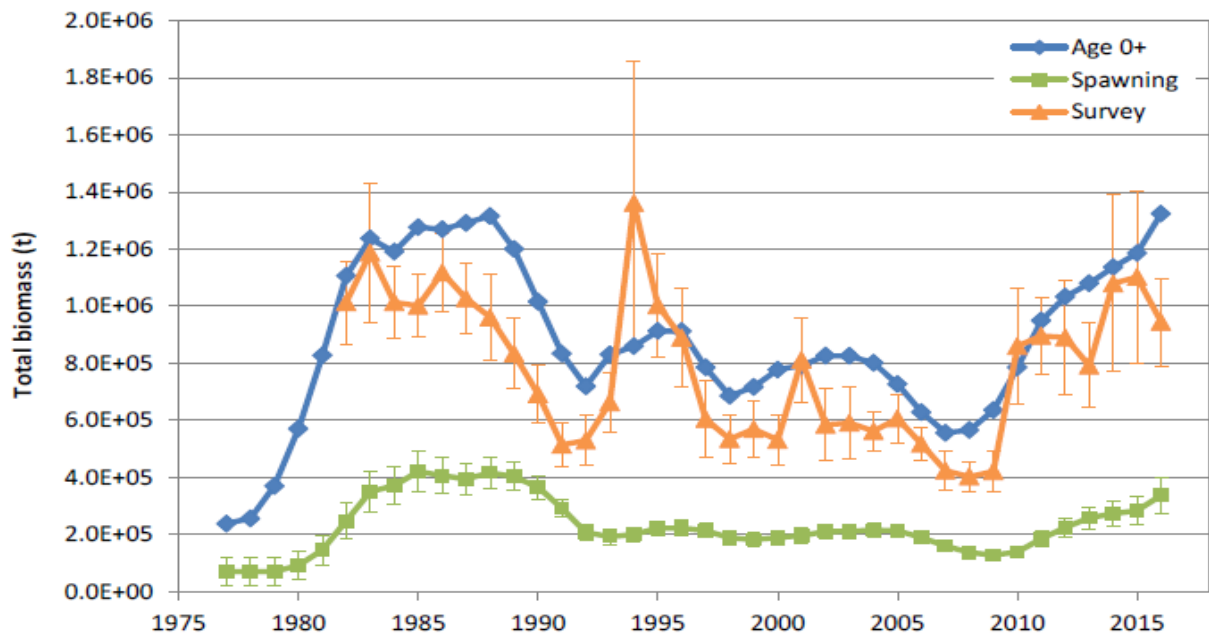


Fig. 3.3.2. Estimated EBS P. cod biomass from accepted model for the 2016 assessment. (Source: Fig. 2.16 of Thompson 2016 EBS P. cod SAFE).

Recruitment of the 2008, 2011, and 2013 year classes were estimated to be the highest in the series (Fig.3.3.3). Thompson (2016 EBS P cod SAFE) notes that to date it has not been possible to estimate a reliable stock recruit relationship for this stock.

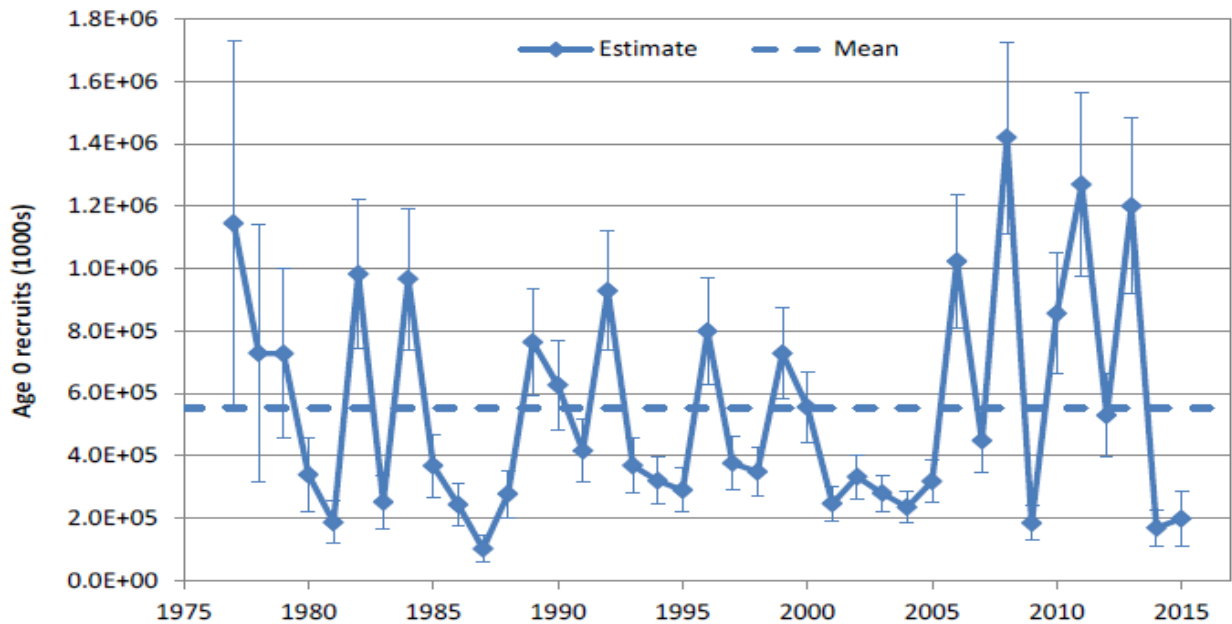


Fig 3.3.3. Time series of age 0 recruitment (1000s of fish), with standard deviations, from the accepted model in the 2016 EBS P. cod assessment. (Source: Fig 2.17 in Thompson 2016 EBS P. cod SAFE).

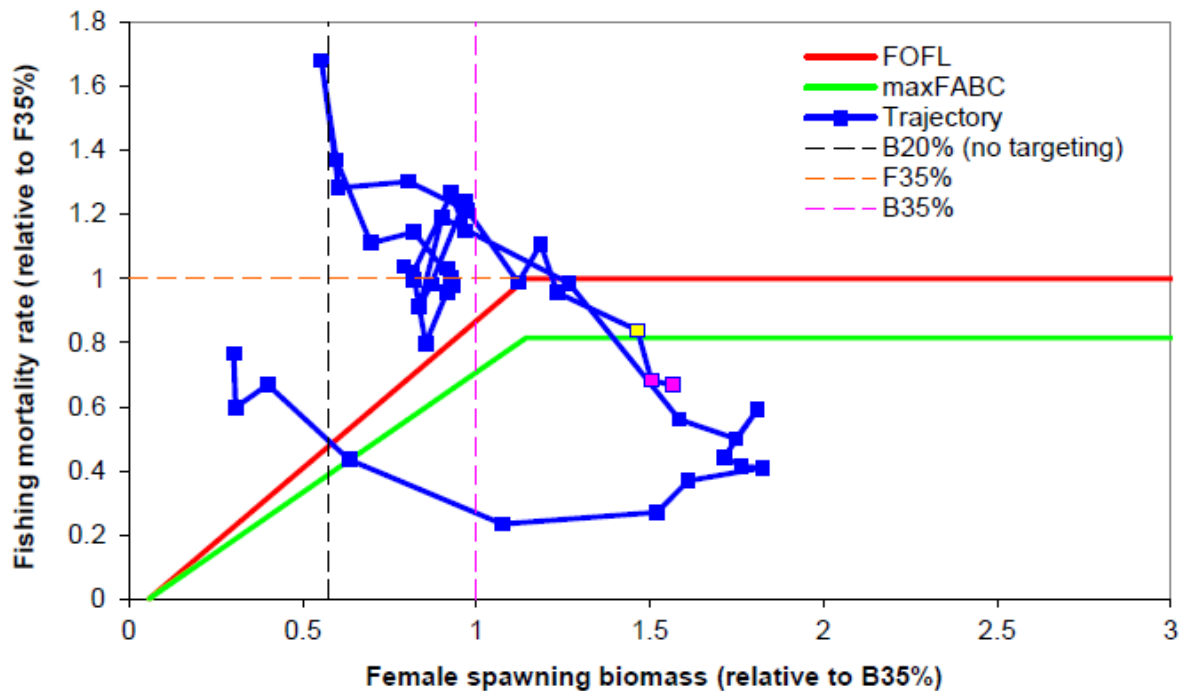


Fig. 3.3.4 Trajectory (1977-2018) of EBS Pacific cod fishing mortality and female spawning biomass as estimated by accepted assessment model in 2016. (yellow square = 2016, magenta squares = first two projection years). (Source Fig. 2.18 Thompson 206 EBS cod SAFE)

Based on the standard set of catch projections carried out annually, and comparing the results to the appropriate reference points, the EBS P. cod stock is not being subjected to overfishing, is not overfished, and is not approaching a condition of being overfished. Model results indicate that spawning biomass will be about 1.5 times above *B35%* in 2017 and 2018, and is currently in Tier 3a of the NPFMC framework. The SAFE results show that the EBS P. cod stock appears to have rebounded from the 2007-8 low point and shows significant increases due in part to strong year classes.

A 2017 ABC of 239,000 tons was recommended in the 2016 SAFE based on the Tier 3a approach. The recommendations for OFL and ABC were accepted by NPFMC in December of 2016, and a TAC of 223,704 tons for 2017 and 2018 was established in the harvest specifications. The 2017 TAC was later implemented by NOAA/NMFS¹⁹.

¹⁹ NMFS BSAI 2017 TAC announcement <https://alaskafisheries.noaa.gov/node/56429>

Status Summary Table for P. cod in Eastern Bering Sea (from Thompson 2016 EBS cod SAFE)

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2016	2017	2017*	2018*
<i>M</i> (natural mortality rate)	0.34	0.34	0.36	0.36
Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	1,830,000	1,780,000	1,260,000	1,110,000
Projected female spawning biomass (t)	466,000	530,000	327,000	340,000
<i>B</i> _{100%}	806,000	806,000	620,000	620,000
<i>B</i> _{40%}	323,000	323,000	248,000	248,000
<i>B</i> _{35%}	282,000	282,000	217,000	217,000
<i>F</i> _{OFL}	0.35	0.35	0.38	0.38
<i>maxF</i> _{ABC}	0.30	0.30	0.31	0.31
<i>F</i> _{ABC}	0.22	0.22	0.31	0.31
OFL (t)	390,000	412,000	284,000	302,000
maxABC (t)	332,000	329,000	239,000	255,000
ABC (t)	255,000	255,000	239,000	255,000
Status	As determined last year for:		As determined this year for:	
	2014	2015	2015	2016
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 255,000 t, 203,000 t, and 212,000 t in 2016, 2017, and 2018, respectively.

GOA area: Full description of the model formulation, input data, and results of the assessment 2016 GOA cod SAFE by Barbeaux et al. The summaries, tables, and figures which follow below are taken from that document.

An age-structured model covering the period from 1977 to 2016 was used to assess GOA P. cod, as has been the practice for this stock. Population dynamics were modeled using standard formulations for mortality and fishery catch. Catches used in the GOA assessment include those taken in the state fisheries in the GOA Region. The model used updated data for 2015-16 where available, and was implemented using ADMB software. The SAFE authors noted that here was substantial changes in the modeling approach applied in the authors' preferred model for 2016. The approach taken with the new model involves a number of simplifications compared to the relatively complex models presented in recent years for GOA Pacific cod. Growth and selectivity treatments were also simplified so that alternative hypotheses could be explored. New datasets, i.e. from the AFSC sablefish longline survey index for P. cod were also introduced. In the course of developing the model proposed by the SAFE authors, over 250 models were examined, including a set of models developed and presented in the September Plan Team and October SSC meetings. An informative subset of the models was presented in the 2016 SAFE, along with detailed description of their evaluation, and the rationale for selection of the authors' preferred model. The SAFE authors noted that the preferred model performance in both fit to the available data and retrospective performance was better than any of the other models proposed.

The following table from Barbeaux et al 2016 GOA P. cod SAFE shows the data used in the 2016 assessment.

Data	Source	Type	Years included
Federal and state fishery catch, by gear type	AKFIN	metric tons	1977 – 2016
Federal fishery catch-at-length, by gear type	AKFIN / FMA	number, by cm bin	1977 – 2016
State fishery catch-at-length, by gear type	ADF&G	number, by cm bin	1997 – 2016
GOA NMFS bottom trawl survey biomass and abundance estimates	AFSC	metric tons, numbers	1984 – 2015
AFSC Sablefish Longline survey Pacific cod RPN	AFSC	RPN	1990 – 2016
GOA NMFS bottom trawl survey length composition	AFSC	number, by cm bin	1984 – 2015
GOA NMFS bottom trawl survey age composition	AFSC	number, by age	1987 – 2015
GOA NMFS bottom trawl survey mean length-at-age and conditional age-at-length	AFSC	mean value and number	1987 – 2015
AFSC Sablefish Longline survey Pacific Cod length composition	AFSC	Number, by cm bin	1990 – 2016

Gulf of Alaska NMFS Bottom Trawl Survey: Trawl surveys have been conducted by NMFS Alaska Fisheries Science Center (AFSC) beginning in 1984 to assess the abundance of groundfish in the Gulf of Alaska. Starting in 2001, the survey frequency was increased from once every three years to every second year. The survey uses a stratified random design, with 49 strata based on depth, habitat, and statistical area. Area-swept biomass estimates are obtained using mean CPUE (standardized for trawling distance and mean net width) and stratum area. The survey is conducted from chartered commercial bottom trawlers using standardized high opening bottom trawls rigged with roller gear, and in a typical survey, about 800 tows are completed. As can be seen in Table 3.3.2, the 2015 survey results for biomass and abundance were significantly decreased from the 2013 values.

Table 3.3.2. P. cod biomass (t) and numbers of fish (1000s), from the GOA bottom trawl survey. Point estimates are shown along with coefficients of variation. (Source – From Table 2.8 Barbeaux et al. 2016 GOA P. cod SAFE).

Year	Biomass(t)	All lengths		CV
		CV	Abundance	
1984	550,971	0.096	320,525	0.102
1987	394,987	0.085	247,020	0.121
1990	416,788	0.100	212,132	0.135
1993	409,848	0.117	231,963	0.124
1996	538,154	0.131	319,068	0.140
1999	306,413	0.083	166,584	0.074
2001	257,614	0.133	158,424	0.118
2003	297,402	0.098	159,749	0.085
2005	308,175	0.170	139,895	0.135
2007	232,035	0.091	192,306	0.114
2009	752,651	0.195	573,469	0.185
2011	500,975	0.089	348,060	0.116
2013	506,362	0.097	337,992	0.099
2015	253,694	0.069	196,334	0.079

AFSC Sablefish longline survey: From the AFSC longline survey for the Gulf of Alaska, data on relative P. cod abundance were added to this year’s models. These data included the Relative Population numbers (RPN) of P. cod as an index of abundance as well as P. cod length composition data for 1990 through 2015. These data were provided to the SAFE authors by Dr. Dana Hanselman of the Auke Bay Laboratory and a description of the methods for the AFSC sablefish longline survey and how the datasets were developed can be found in Hanselman et al. (2015) and Echave et al. (2012). This RPN index for P. cod is shown in Fig. 3.3.5.

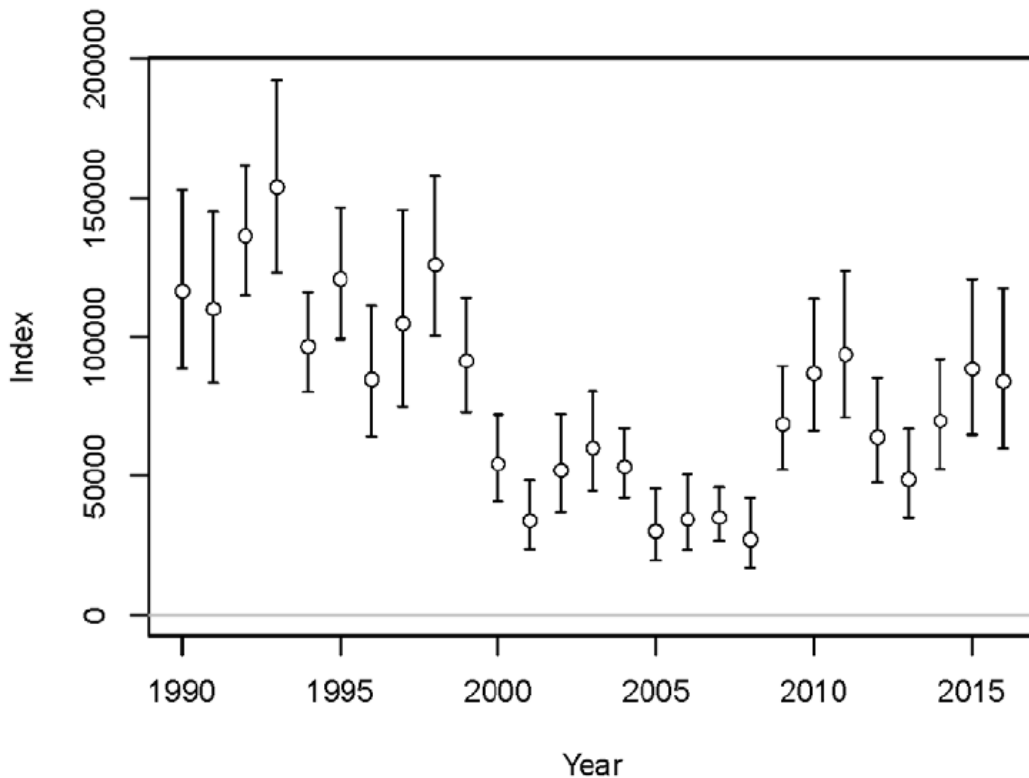


Fig. 3.3.5. AFSC Auke Bay Laboratory GOA longline survey, P. Cod relative population number (RPN) index. (Source : Fig. 2.13 Barbeaux et al. 2016 GOA P. cod SAFE).

GOA Assessment results: Information in the following section is from Barbeaux et al. 2016 SAFE:

Estimates of spawning biomass (Fig. 3.3.6) show a trend of decline from a peak in 1985 at 214,060 t to its lowest level of 51,225 t in 2008 followed by a continued increase through 2016 to 91,210 t. Projections within the model shows an increase in spawning biomass as the large 2012 and 2013 year classes mature, but then decrease starting in 2018 due to poor recruitment since 2014 (Fig 3.3.6). Spawning biomass for 2017 is estimated by this year’s model to be 98,479 t. This is above the *B40%* value of 78,711 t, thereby placing Pacific cod in sub-tier “a” of Tier 3.

The recruitment predictions from the accepted model (Fig. 3.3.6) show large 1977 and 2012 recruitments with more than 1 billion age-0 fish for each although uncertainty on the 1977 recruitment estimate was large. Large recruitments (<0.7 billion age-0) were also estimated for 1979, 1980, 1984, 1985, 1989, and 2011. Between 1990 and 2010 the average recruitment was estimated at 0.448 billion, 38% lower than the 1977-1989 mean recruitment of 0.725 billion and 20% lower than the 1977-2015 mean recruitment of 0.562 billion.

Fishing mortality appears to have increased steadily with the decline in abundance from 1990 through a peak in 2010 (Fig. 3.3.7). This period saw a decline in recruitment paired with increases in catch. The largest increase in catch has been in the pot fishery, which also shows the largest increase in continuous F. F was estimated to have been above *F35%* for the years between 2007 and 2012 and again in 2014 and 2015 and biomass was below *B35%* between 2008 and 2011.

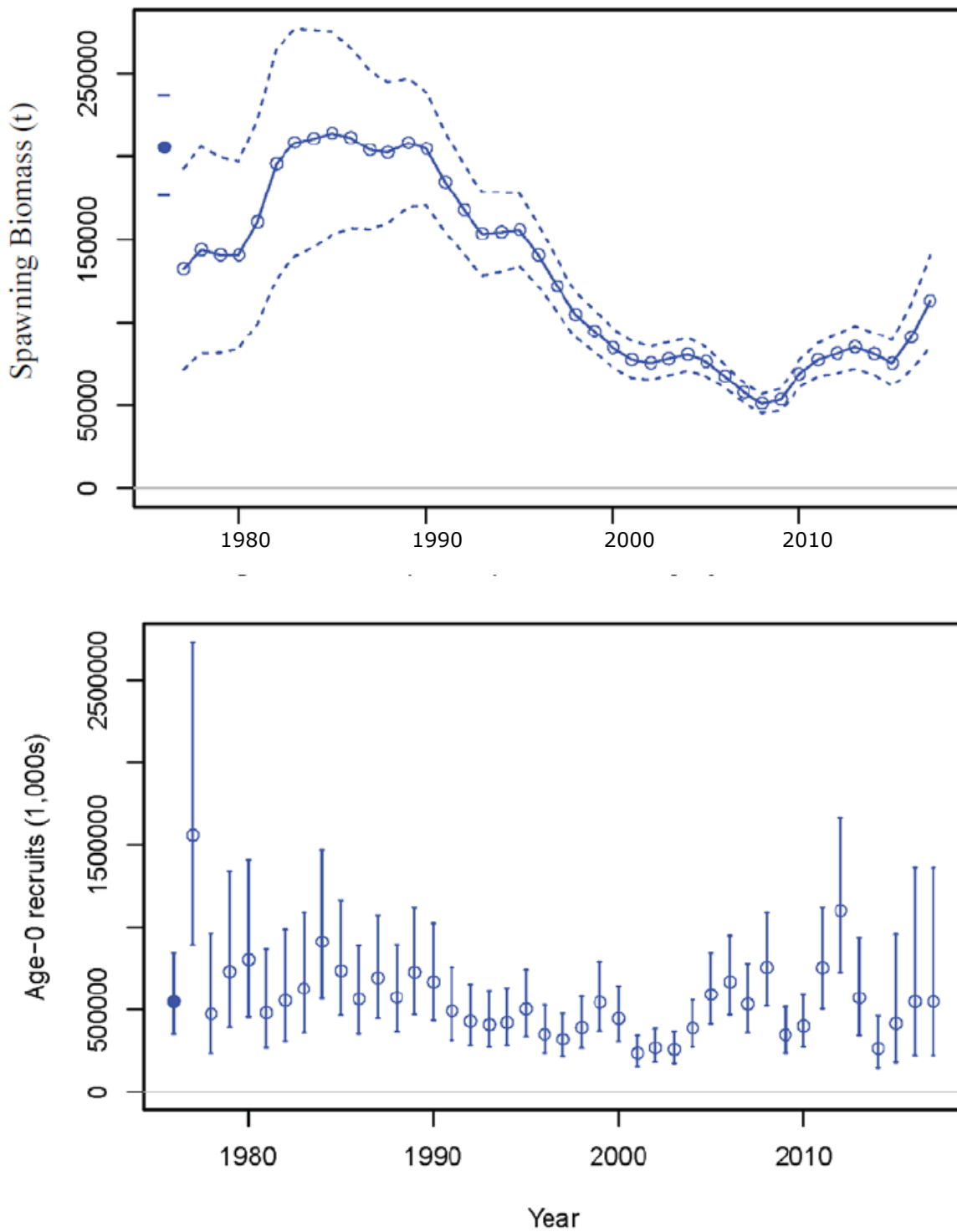


Fig. 3.3.6. Estimated time series of GOA P.cod spawning biomass (t) –top panel, and age-0 recruits (000s) bottom panel, both with 95% asymptotic error intervals. (From Figs. 2.40 and 2.42 of Barbeaux et al. 2016 SAFE).

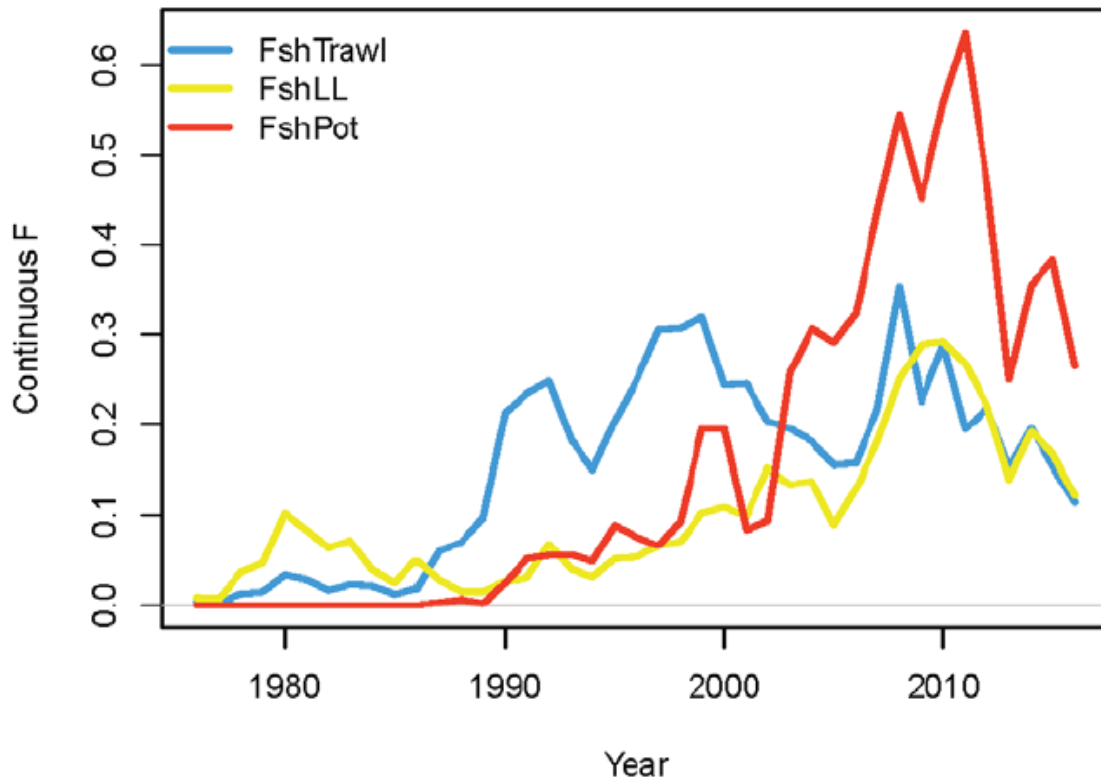



Fig. 3.3.7. Estimates of fishing mortality by trawl (FshTrawl), longline (FshLL) and pot (FshPot) fisheries from assessment of GOA P. cod. (Source: Fig 2.45 Barbeaux et al. 2016 GOA P. cod SAFE).

The SAFE authors note the substantial change in results from the 2015 model, as the 2016 modeling switches the overall assumption from a large, older, cryptic population to a much younger population with higher natural mortality than previous models. Although this change in the model results in a much lower spawning biomass and historical total biomass estimates, the effect on ABC and OFL were small. The following summary of results is from Barbeaux et al. 2016 GAO P. cod SAFE:

Quantity	As estimated or <i>specified last</i> year for:		As estimated or <i>specified this</i> year for:	
	2016	2017	2017	2018
M (natural mortality rate)	0.38	0.38	0.47	0.47
Tier	3a	3a	3a	3a
Projected total (age 0+) biomass (t)	518,800	472,800	426,384	428,885
Female spawning biomass (t)				
Projected	165,600	141,800	98,479	90,572
$B_{100\%}$	325,200	325,200	196,776	196,776
$B_{40\%}$	130,000	130,000	78,711	78,711
$B_{35\%}$	113,800	113,800	68,872	68,872
F_{OFL}	0.495	0.495	0.652	0.652
$maxF_{ABC}$	0.407	0.407	0.530	0.530
F_{ABC}	0.407	0.407	0.530	0.530
OFL (t)	116,700	116,700	105,378	94,188
maxABC (t)	98,600	85,200	88,342	79,272
ABC (t)	98,600	85,200	88,342	79,272
Status	As determined <i>last</i> year for:		As determined <i>this</i> year for:	
	2014	2015	2015	2016
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no



Based on the standard set of catch projections involving different harvest scenarios and comparing the results to the appropriate reference points, the GOA P. cod stock is not being subjected to overfishing, is not overfished, and is not approaching an overfished status. A 2017 ABC of 88,342 tons was recommended in the 2016 SAFE based on the Tier 3a approach. The recommendations for OFL and ABC were accepted by NPFMC in December of 2016, and TACs of 64,442 tons for 2017 and 57,825 t for 2018 were established in the harvest specifications. The 2017 TAC was later implemented by NOAA/NMFS²⁰.

AI Area: *Full description of the model formulation, input data, and results of the assessment 2016 AI P. cod SAFE by Thompson and Palssonl. The summaries, tables, and figures which follow below are taken from that document.*

The SAFE authors noted that harvest specifications for AI Pacific cod have been based on Tier 5 (non-age-structured) methods since the AI and EBS P. cod stocks began to be managed separately in 2014. Age-structured models of this stock have been explored in every assessment from 2012 including up through the 2016 preliminary assessment. The Plan Team and SSC recommended that no age-structured models be included in this year's final assessment of the AI Pacific cod stock, so that more time would be available for development of new age-structured models of the EBS P. cod stock. Thus, this year's final assessment includes no changes in assessment methodology.

The time series of NMFS bottom trawl survey biomass is shown for the Aleutian *management* area for Eastern, Central, and Western AI, together with their coefficients of variation, in Table 3.3.3. The survey series starts in 1991, and initially was conducted every third year. Since 2000, the surveys have been conducted every other year. The biomass data indicate a consistent decline throughout the time series, and simple linear regression on the time series estimates a negative slope coefficient that is statistically significant at the 1% level (Thompson and Palsson 2016 AI P. cod SAFE). The 2016 survey biomass estimate was higher than the 2010-2014 points. Although not used as an input to the assessment model, gear-specific time series of fishery CPUE also show a slight declining long-term trend, although neither trend is statistically significant at the 5% level (Fig. 3.3.8).

The Tier 5 random effects model used is a very simple, state-space model of the "random walk" variety. The only parameter is the log of the log-scale process error standard deviation. The random effects model assumes that the observation error variances are equal to the sampling variances estimated from the haul-by-haul survey data. The log-scale process errors and observations are both assumed to be normally distributed. When used to implement the Tier 5 harvest control rules, the Tier 5 models also require an estimate of the natural mortality rate and to be consistent with the EBS P. cod assessment (Thompson 2016 SAFE), a natural mortality rate of 0.36 is assumed in the AI P. cod assessment as well.

The assessment model's fit to the survey biomass time series is shown in Figure 3.3.9. The correlation between the survey biomass data and the model's estimates is 0.975. The model biomass estimate for 2016 was 79,553 tons.

²⁰ NMFS 2017 GOA TAC announcement <https://alaskafisheries.noaa.gov/node/55457>

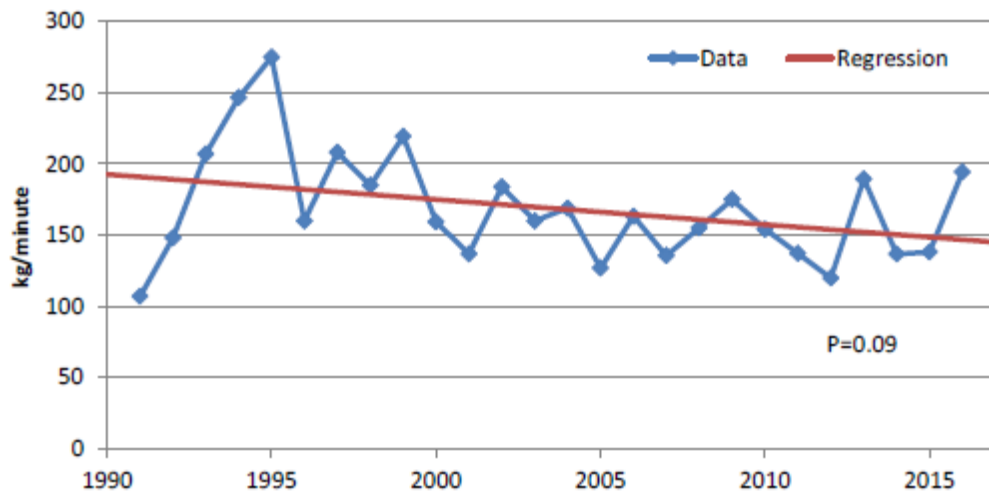
Table 3.3.3. Total P. cod biomass (absolute and relative), with coefficients of variation, as estimated by AI shelf bottom trawl surveys, 1991-2016 (Source: Table 2A.d from Thompson and Pálsson 2016 AI P. cod SAFE).

Year	Biomass (t)			
	Western	Central	Eastern	All
1991	75,514	39,729	64,926	180,170
1994	23,797	51,538	78,081	153,416
1997	14,357	30,252	28,239	72,848
2000	44,261	36,456	47,117	127,834
2002	23,623	24,687	25,241	73,551
2004	9,637	20,731	51,851	82,219
2006	19,480	22,033	43,348	84,861
2010	21,341	11,207	23,277	55,826
2012	13,514	14,804	30,592	58,911
2014	18,088	8,488	47,032	73,608
2016	19,775	19,496	45,138	84,409

Year	Biomass proportions			
	Western	Central	Eastern	All
1991	0.419	0.221	0.360	1.000
1994	0.155	0.336	0.509	1.000
1997	0.197	0.415	0.388	1.000
2000	0.346	0.285	0.369	1.000
2002	0.321	0.336	0.343	1.000
2004	0.117	0.252	0.631	1.000
2006	0.230	0.260	0.511	1.000
2010	0.382	0.201	0.417	1.000
2012	0.229	0.251	0.519	1.000
2014	0.246	0.115	0.639	1.000
2016	0.234	0.231	0.535	1.000

Year	Biomass coefficient of variation			
	Western	Central	Eastern	All
1991	0.092	0.112	0.370	0.141
1994	0.292	0.390	0.301	0.206
1997	0.261	0.208	0.230	0.134
2000	0.423	0.270	0.222	0.185
2002	0.245	0.264	0.329	0.164
2004	0.169	0.207	0.304	0.200
2006	0.233	0.188	0.545	0.288
2010	0.409	0.257	0.223	0.189
2012	0.264	0.203	0.241	0.148
2014	0.236	0.276	0.275	0.187
2016	0.375	0.496	0.212	0.184

Trawl



Longline

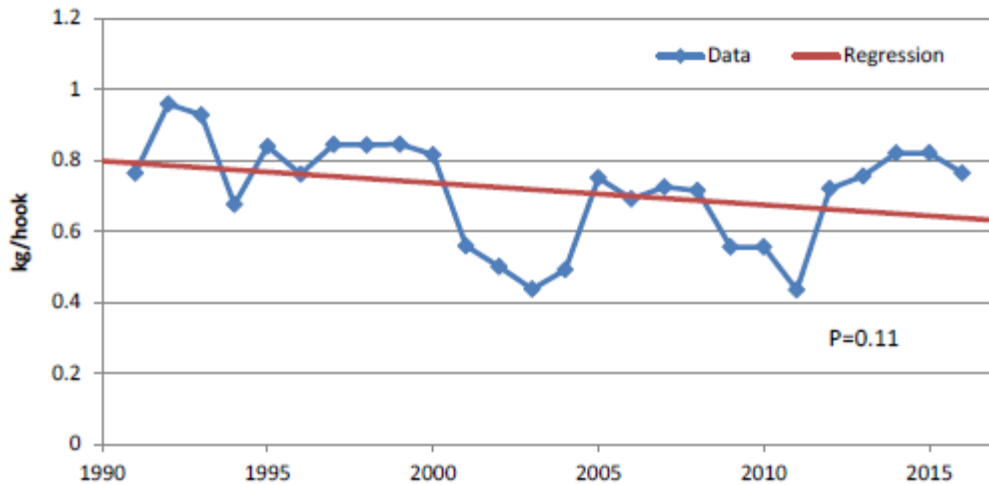


Fig. 3.3.8. Catch per unit effort for the trawl and longline fisheries for AI P. cod, 1991-2016 (2016 data are partial). (Source Fig. 2A.2 from Thompson and Palsson 2016 AI P. cod SAFE).

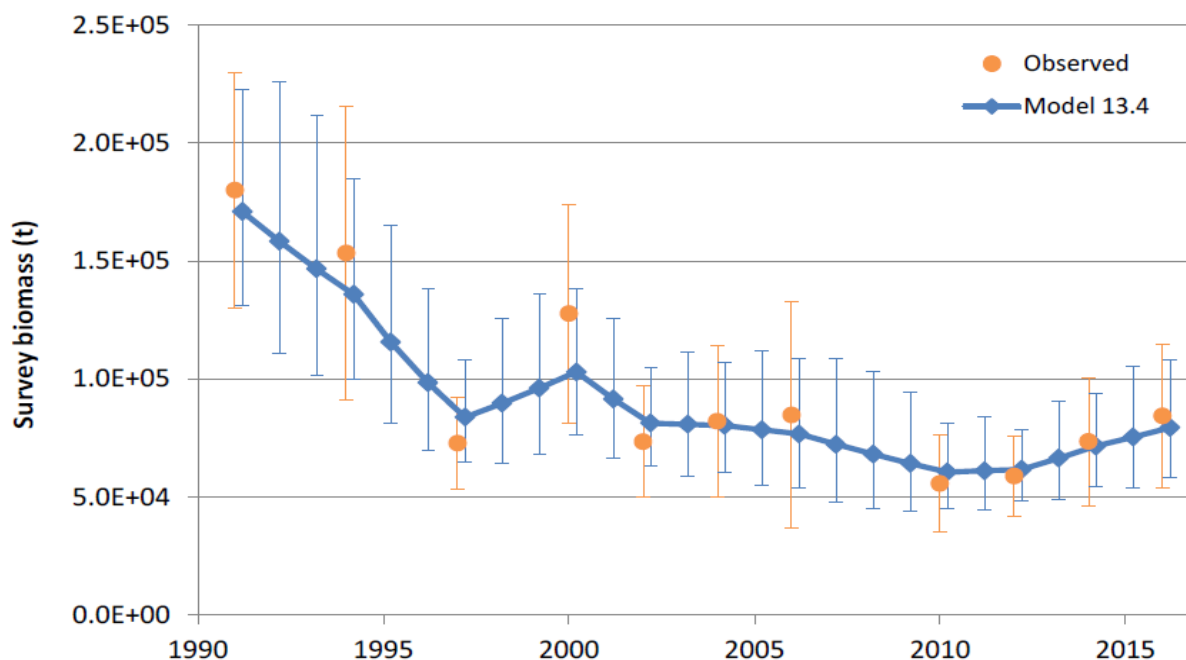


Fig. 3.3.9. Fit of the 2016 assessment model for AI P. cod to survey biomass time series, with 95% confidence intervals for the observations and the estimates. (Source: Fig. 2A.4 from Thompson and Palsson 2016 AI P. cod SAFE).

Using the 2016 model biomass estimates estimate, the value for natural mortality, and the Tier 5 formulae specified in the NPFMC FMP, OFL and maxABC values were calculated as per the following table (from the 2016 AI P. cod SAFE). The recommendations for OFL and ABC were accepted by NPFMC in December of 2016, and TACs of 15,695 tons for 2017 and 2018 were established in the harvest specifications. The 2017 TAC was later implemented by NOAA/NMFS²¹.

Quantity	As estimated or specified last year for:		As estimated or recommended this year for:	
	2016	2017	2017	2018
M (natural mortality rate)	0.34	0.34	0.36	0.36
Tier	5	5	5	5
Biomass (t)	68,900	68,900	79,600	79,600
F_{OFL}	0.34	0.34	0.36	0.36
$maxF_{ABC}$	0.26	0.26	0.27	0.27
F_{ABC}	0.26	0.26	0.27	0.27
OFL (t)	23,400	23,400	28,700	28,700
maxABC (t)	17,600	17,600	21,500	21,500
ABC (t)	17,600	17,600	21,500	21,500
Status	As determined last year for:		As determined this year for:	
	2014	2015	2015	2016
Overfishing	No	n/a	No	n/a

As noted by the SAFE authors, the official AI catch estimate for the most recent complete year (2015) is 9,225 t. This is less than the 2015 AI OFL of 23,400 t. Therefore, the AI Pacific cod stock is not being subjected to overfishing. Because the stock is managed under Tier 5, no determination can be made with respect to overfished status.

²¹ NMFS BSAI 2017 TAC announcement <https://alaskafisheries.noaa.gov/node/56429>

3.4 International fishery stock assessment guidance (where applicable)

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 NPFMC (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 (where available)

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 Magnusson Stevens Act (MSA) 2007, established new statutory requirements to end and prevent overfishing. It required the Scientific and Statistical Committees (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 (ACLs) 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 nation-wide.

Assuming that catch is measured accurately, ACLs 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 NPFMC has consistently adopted the annual Overfishing Limits²² (OFL) and acceptable biological catch (ABC) recommendations from its SSC and set the total allowable catch (TAC) for each of its commercial groundfish stocks at or below the respective ABC.

In 1996, the NPFMC capped the rate of fishing mortality 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 fishing mortality is reduced relative to the stock status.

The NPFMC seeks to maintain a healthy ecosystem to insure long-term sustainability, therefore, both target and non-target species are regularly assessed and bycatch limits, including Prohibited Species²³

²² An Over Fishing 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 F_{MSY} (or a proxy for F_{MSY})

²³ Prohibited Species are species that support traditional, near-shore Alaska fisheries. These species include Pacific halibut, Pacific herring,

Catch (PSC), 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 (SSL) with areas excluded to fishing around rookeries and haulouts (10 & 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

3.6.1.1 Principle Management organisations

Principal Management Organisations

The National Marine Fisheries Service (NMFS)

NMFS (also known as NOAA fisheries) is responsible for the management, conservation, and protection of living marine resources within the US Exclusive Economic Zone (EEZ). The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nautical miles – nm), with responsibilities covering 842,000 nm² off Alaska. In addition to stock survey, stock assessment reports and biological studies related to the Pacific cod fisheries, NMFS is charged with carrying out the federal mandates of the U.S. Department of Commerce with regard to commercial fisheries such as approving and implementing Fisheries Management Plans (FMPs) and FMP amendments recommended by the North Pacific Fisheries Management Council (NPFMC). The NMFS's Office for Law Enforcement (OLE) partners the U.S. Coast Guard in the monitoring, control and enforcement of fisheries regulations.

The North Pacific Fishery Management Council (NPFMC)

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

Alaska Department of Fish and Game (ADFG) and Board of Fisheries (BOF)

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

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)

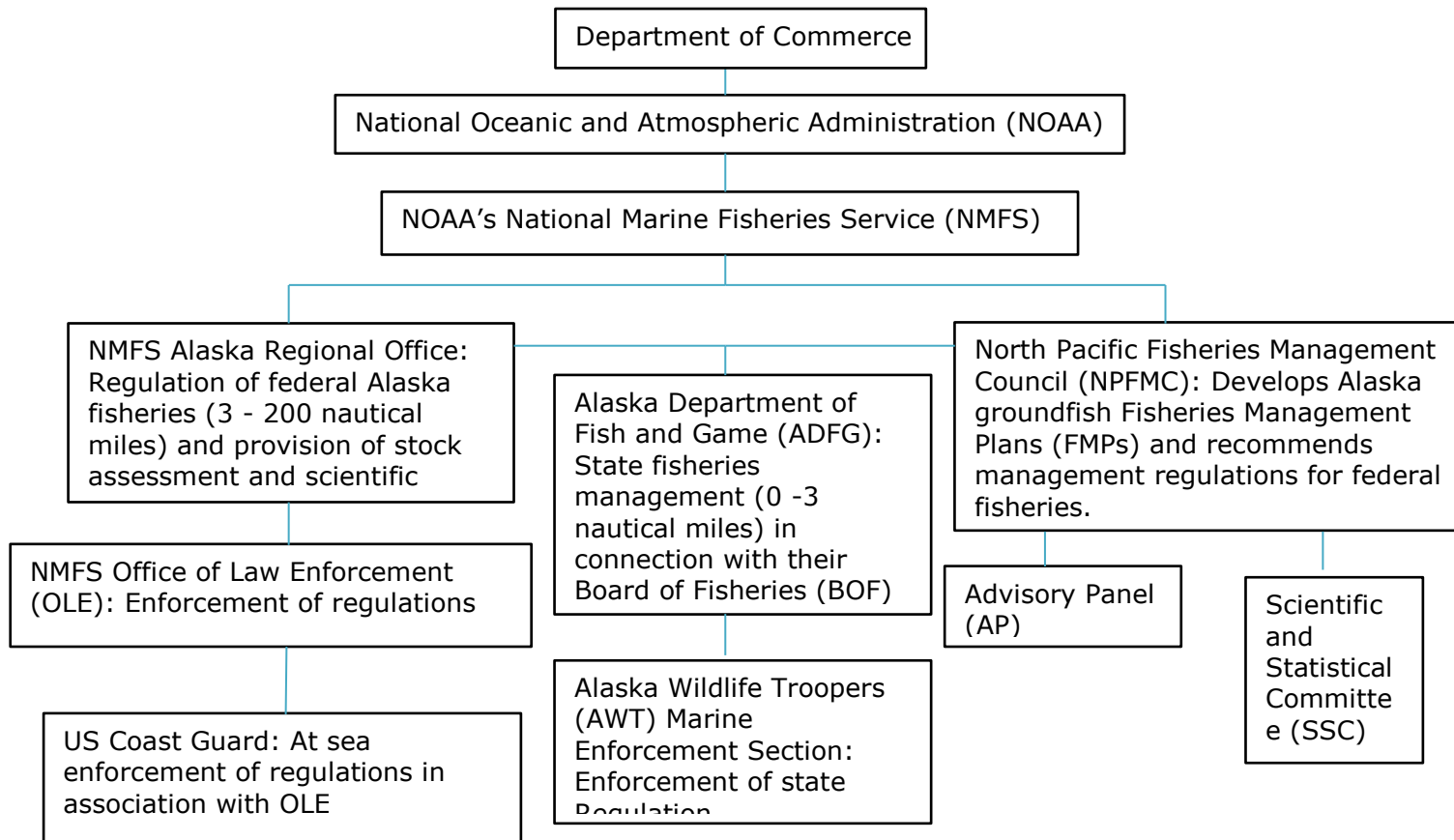


Fig. 3.6.1.1. The organisational structure for the management of the Alaska groundfish fisheries (adapted from: Global Trust, 2011)

3.6.2 Establishment legislation

Federal

The principal legislative instrument for fisheries management in the US is the MSA (MSA 2007²⁴). The MSA contains ten National Standards (NSs) which fishery managers must consider when preparing a Fishery Management Plan (FMP) or Amendment. These NSs are:

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

²⁴ http://www.nmfs.noaa.gov/sfa/laws/sfa/laws_policies/msa/documents/msa_amended_2007.pdf

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

NMFS implements the MSA and the NSs. The procedures on how NMFS follows the NSs are published in the US Federal Register at 50 CFR Part 600 subpart D²⁵.

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

State

State waters are fished under State of Alaska commercial fisheries regulations. The General Commercial Fisheries Regulations²⁶ establishes the basic regulations, i.e. those that give the ADFG and BOF the powers to regulate and manage the state fishery resource and describe the extent of their regulatory powers. The Commercial Groundfish Fisheries Regulations²⁷, defines the statewide groundfish provisions. State-wide regulations 5 AAC 28.086 and 5 AAC 28.087 give the ADFG authority to manage parallel fisheries (those Council groundfish fisheries within state waters) and parallel fisheries with Stellar Sea Lion (SSL) restrictions, respectively, incorporating federal/Council regulations within state waters.

3.6.3 Governance procedure

The North Pacific Fisheries Management Council (NPFMC)

The NPFMC primarily manages groundfish in the BSAI and GoA, targeting pollock, Pacific cod, flatfish, mackerel, sablefish, and rockfish harvested by trawl, longline, jig, and pot gear (NPFMC 2009). The NPFMC conducts public hearings so as to allow all interested persons an opportunity to be heard in the development of FMPs and amendments, and reviews and revises, as appropriate, the assessments and specifications with respect to the optimum yield from each fishery (16 U.S.C. 1852(h)). The NPFMC has developed a management policy and objectives to guide its development of management recommendations to the Secretary of Commerce. Other large Alaska fisheries for salmon, crab, and scallops are managed jointly with the State of Alaska. The NPFMC also works very closely with the ADFG and the BOF to coordinate management programs in federal and state waters. Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the NPFMC and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other.

The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process²⁸ (NPFMC 2009) and the Council Operating Procedures²⁹ (NPFMC 2012a). The following section draws upon NPFMC (2009) and NPFMC (2012a).

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

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

The eleven voting members include:

- The director of the Alaska Department of Fish and Game or a designee;
- The director of the Washington Department of Fish and Wildlife or a designee;
- The director of the Oregon Department of Fish and Wildlife or a designee;

²⁵ <https://www.law.cornell.edu/cfr/text/50/part-600/subpart-D>

²⁶ http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/statutes_general_provisions_2013-2014.pdf

²⁷ http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groundfish.pdf

²⁸ https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

²⁹ <https://www.npfmc.org/wp-content/PDFdocuments/membership/SOPPs412.pdf>

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

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

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

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


The NPFMC appoints "Plan Teams" for each of the major FMPs. Members of each team are selected from those agencies and organizations having a role in the research and/or management of fisheries. The Plan Teams review stock assessment information and assist in the preparation of the annual Stock Assessment and Fishery Evaluation (SAFE) documents including formulation of recommendations on annual Acceptable Biological Catch (ABC) levels for groundfish, crab, and scallop species under the jurisdiction of the Council. The Plan Teams may also prepare and/or 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 NPFMC may appoint standing and ad-hoc committees from among the voting and non-voting members and knowledgeable members of the public, as it deems necessary for the conduct of Council business. The NPFMC Chair may also appoint standing or ad-hoc Committees that include industry representatives or other participants to address specific management issues or programs.

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

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



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

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

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

The Council may hold public hearings in order to provide the opportunity for all interested individuals to be heard with respect to the development of fishery management plans or amendments, and with respect to the administration and implementation of other relevant features of the Act. Notice of each hearing must be received by NMFS for publication in the Federal Register at least 23 calendar days prior to the proposed hearing. The Council will also issue notices to announce the time, location, and agenda for each hearing in a manner sufficient to assure all interested parties are aware of the opportunity to make their views known. If it is determined a hearing is appropriate, the Council Chair will designate at least one voting member of the Council to officiate. An accurate record of the participants and their views will be made available to the Council at the appropriate Council meeting and maintained as part of the Council's administrative record (NPFMC 2009).

The procedure for changing Federal fishing regulations follows a standardized process, set by a combination of laws, regulations, operational guidelines, policies, as well as adjustments and adaptations developed by the Council intended to increase efficiency, provide public participation, and produce quality outcomes (NPFMC 2009; 2014³⁰). 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.

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 2009).

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

³⁰ <https://www.npfmc.org/wp-content/PDFdocuments/MISC/RegProcess.pdf>
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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 2009).

The NMFS region prepares draft regulations based on Council action, and once cleared by the region and OMB, a proposed rule is published in the Federal Register. The public is provided time to comment on the proposed rule (NPFMC 2009). Final Rule. NMFS region staff summarizes comments, and may make adjustments to the rule based on these comments. The response to comments, the revised final rule, and final approval decision is published in the Federal Register (NPFMC 2009).

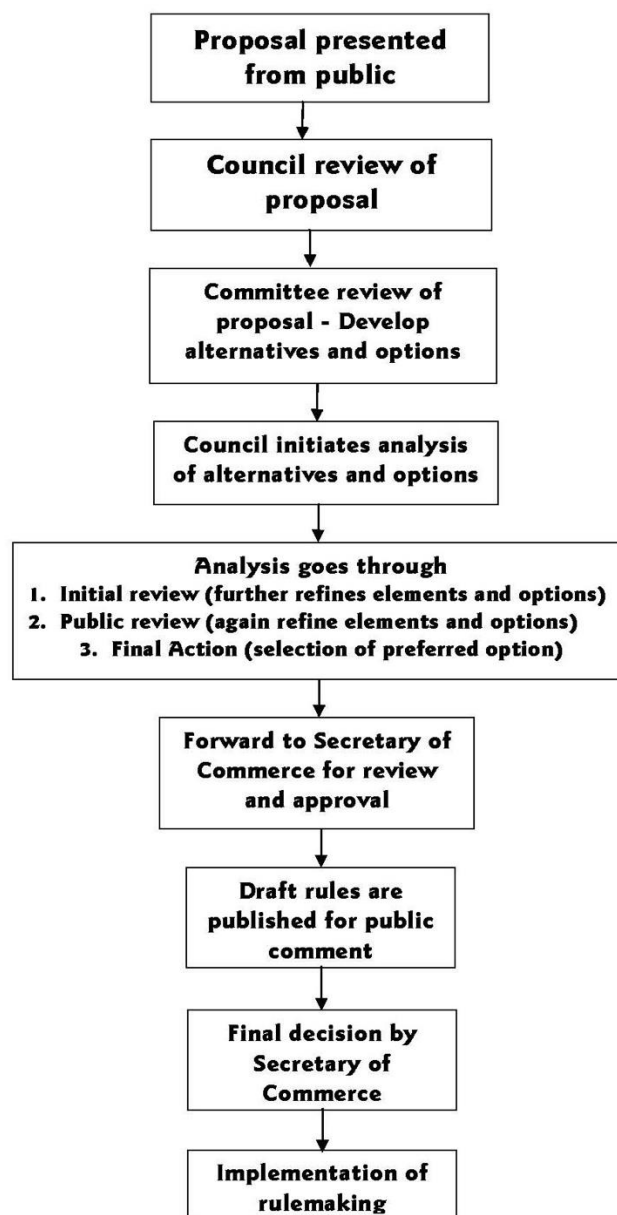


Figure 1.6.3. Flow showing the process for regulatory change at the NPFMC (Source NPFMC 2009)

Alaska Board of Fisheries (BOF)

The BOF³¹ 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 16.05.221³²).

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

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

The BOF has the authority to adopt regulations described in AS 16.05.251³³ 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- 77³⁴.

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

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

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

3.6.4 Reporting activities

The NPFMC and BOF management arrangements and decision making processes are organised in a very transparent manner. The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites^{35, 36, 37, 38, 39} 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/Committees, research, habitat

³¹ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

³² <http://www.touchngo.com/Iglcntr/akstats/Statutes/Title16/Chapter05/Section221.htm>

³³ <http://touchngo.com/Iglcntr/akstats/Statutes/Title16/Chapter05/Section251.htm>

³⁴ <http://www.touchngo.com/Iglcntr/akstats/aac/title05.htm>

³⁵ <https://www.npfmc.org>

³⁶ <https://alaskafisheries.noaa.gov>

³⁷ <https://www.afsc.noaa.gov>

³⁸ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

³⁹ <http://www.adfg.alaska.gov/index.cfm?adfg=home.main>

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 OLE⁴⁰ and the USCG⁴¹ (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 AWT⁴² 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 679⁴³]) and international agreements, e.g. combating Illegal, Unreported, Unregulated (IUU) fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia.

The OLE in Alaska⁴⁴ focuses on outreach and education programs to help the fishing industry understand the rationale for regulations and prevent or minimize infractions. The OLE enforcement staffing levels have recently increased; sixteen special agents and enforcement officers now operate in the Alaska region. The NMFS Alaska Region OLE reports few major compliance issues (pers. comm. Nathan Lagerwey).

The OLE publishes a national annual report⁴⁵ and the Alaska region submits six monthly reports to the NPFMC (as an example see OLE 2017⁴⁶ - Report for the period 1st October 2016 – 31st March 2017: for all fisheries, there were: 51 written warnings, 238 summary settlements and 1 criminal case. While the report does not distinguish which fishery the offences related to, none involved the Pacific cod fishery (pers. comm. Nathan Lagerwey).

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's Office of General Counsel (OGC) for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment (pers. comm. Nathan Lagerwey). The MSA has an enforcement policy section (50 CFR 600.740⁴⁷) that details these "remedies for violations".

The USCG⁴⁸ is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District⁴⁹ 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 (pers. comm. Stephen White). The USCG makes an annual report to the NPFMC (See Enforcement Committee webpage⁵⁰) on resources applied to fishery enforcement in the previous year, the number of boardings/inspections, the number of violations, lives lost at sea, safety issues, and any changes in regulations. The most recent report April – May 2017, indicates a low number of infractions: from a total of 93 boardings, all but one were related to safety equipment deficiencies, none were associated with the Pacific cod.

⁴⁰ <http://www.nmfs.noaa.gov/ole/>

⁴¹ <http://www.pacificarea.uscg.mil/Our-Organization/District-17/>

⁴² <http://dps.alaska.gov/AWT/>

⁴³ <https://alaskafisheries.noaa.gov/fisheries-679regs>

⁴⁴ http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html

⁴⁵ http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf

⁴⁶ <https://npsfmcl.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C>

⁴⁷ <https://www.law.cornell.edu/cfr/text/50/600.740>

⁴⁸ <https://www.uscg.mil>

⁴⁹ <http://www.pacificarea.uscg.mil/Our-Organization/District-17/>

⁵⁰ <https://www.npfmc.org/committees/enforcement-committee/>

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 (pers. comm. Nathan Lagerwey). 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 (pers. comm. Stephen White).

The NPFMC Groundfish and Halibut Observer Program⁵¹ (The 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 Pacific cod stock assessment and management. While observers are not directly part of the federal MCS programme 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 (pers. comm. Nathan Lagerwey).

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 category⁵². Vessels in the full coverage category include:

- catcher/processors
- motherships
- catcher vessels while participating in the pollock fisheries
- catcher vessels while participating in Community Development Quota (CDQ) groundfish fisheries (except: sablefish; and pot or jig gear catcher vessels)
- catcher vessels while participating in the Central Gulf of Alaska Rockfish Program
- inshore processor when receiving or processing Bering Sea pollock

Vessels in the partial coverage category include:

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

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 LOA, and all catcher vessels of any length fishing with jig, handline, troll, and dinglebar troll gear.
2. "Trip Selection pool" - This category applies to all catcher vessels of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 40 feet LOA. These vessels are subject to random deployment of observers.

From the 2016, annual observer program report⁵³, observer coverage in the BSAI Pacific cod fisheries by catcher/processors, and catcher vessels delivering to motherships was 100% for all 3 major gear types. For catcher vessels delivering shoreside, about 50% of Pacific cod caught by non-pelagic trawls was observed, and, about 15% of Pacific cod taken by pots was observed.

Observer coverage in the 2016 GOA Pacific cod fisheries by catcher/processors was at 100%, for the only two gears involved (longline and trawl). For catcher vessels, the observed percentages of cod catch ranged from 7% in longline, to 14% in trawls.

The primary responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska lies with the Alaska Department of Public Safety⁵⁴, through its Division of Alaska Wildlife Troopers⁵⁵ (the division also enforces non-fisheries related regulations passed by the Board of Game). Biologists and

⁵¹ <https://alaskafisheries.noaa.gov/fisheries/observer-program>

⁵² <https://alaskafisheries.noaa.gov/sites/default/files/observer-prog-summary2016.pdf>

⁵³ <https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf>

⁵⁴ <http://dps.alaska.gov>

⁵⁵ <http://dps.alaska.gov/AWT/>

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 arrest⁵⁶. 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), and the Commercial Operators Annual report, as required by Alaska Statute (Section 16.05.690 Record of Purchases⁵⁷) and the Alaska Administrative Code (5 AAC 39.130⁵⁸ Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements).

The NPMC have an established Enforcement Committee⁵⁹ charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea⁶⁰. 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 Other relevant fisheries in the vicinity not subject to certification but that may interact with the fishery being assessed

The pollock fishery in the BSAI and GOA and the flatfish fisheries (Amendment 80 fleet) may interact with the Pacific cod (jig, pot, trawl, longline) fisheries but they are certified against the Responsible Fisheries Management Standard.

Other fisheries/fleets that are not certified but have the potential to coincide or interact with the Pacific cod fisheries include the:

- Halibut longline fleet/fishery
- Sablefish longline fleet/fishery
- BSAI crab fleet/fishery
- Scallop fleet/fishery
- Salmon fishery – in as much as some methods employed in the cod fisheries may take salmon as a bycatch.

No reports of gear conflict with other vessels or gear types targeting other species was brought to the attention of assessment team. There was a general consensus expressed by stakeholders that conflict resolution between different fisheries was usually resolved between the individuals / sectors without the need for intervention. It was also expressed that, the Council and the BOF actively encourage stakeholder participation in open, public sessions and, as such, these provide forums to air concerns and help avoid of potential fisheries conflicts.

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

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

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

The effects of environmental variation on production of pollock, cod and other groundfish in the Bering Sea has been extensively studied in terms of physical oceanography, ecosystem variability and fish


⁵⁶ <http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main>

⁵⁷ <http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section690.htm>

⁵⁸ <https://www.adfg.alaska.gov/static/license/fishing/pdfs/5aac39.pdf>

⁵⁹ <https://www.npfmc.org/committees/enforcement-committee/>

⁶⁰ https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf



production, NOAA, and the NMFS AFSC coordinates the production of a vast amount of new environmental and other information expected to improve groundfish fishery management in Alaska.

Several ecosystem-wide oceanographic phenomena have been identified. The Pacific Decadal Oscillation (PDO), with decadal changes in 'warm' and 'cold' phases has been correlated with a number of factors including sea level pressure, precipitation and salmon landing in the Pacific USA, including Alaska (<https://www.nwfsc.noaa.gov/research/divisions/fe/estuarine/oeip/ca-pdo.cfm>).

Pollock and Pacific cod show interannual variability in recruitment that appears more related to El Niño Southern Oscillation (ENSO) driven climate variability. Years of strong onshore transport, typical of warm years in the Bering Sea, correspond with strong recruitment of walleye pollock, possibly due to separation of young fish from cannibalistic adults). The extent and timing of the presence of sea ice in the Bering Sea also determines the area where cold bottom water temperatures will persist throughout the following spring and summer. This eastern Bering Sea 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. Walleye pollock have shown a preference for warmer water and exhibit an avoidance of the cold pool such that in colder years they utilize a smaller portion of the shelf waters and in warm years have been observed much further north. Strong year-classes of pollock have been found to coincide with above-normal air and bottom temperatures and reduced ice cover. These favourable years of production are the result of good juvenile survival and have been shown to be related, among other things, to a wider distribution of juvenile pollock relative to the adult population, which influences the level of predation (http://www.beringclimate.noaa.gov/essays_livingston.html).

Current conditions are of an unusually warm phase. Sea surface temperatures as much as three degrees C (about 5.4 degrees F) higher than average, lasting for months, and appears on large- scale temperature maps as a red-orange mass of warm water many hundreds of miles across (aka 'the blob'); with a significant area of warm water dominating the Gulf of Alaska and a more recent expanse of exceptionally warm water in the Bering Sea. This appears different to normal patterns of ocean conditions such as the El Niño Southern Oscillation or Pacific Decadal Oscillation (<https://www.ncdc.noaa.gov/teleconnections/pdo>). Temperature anomalies are shown in the figure below (from https://www.nwfsc.noaa.gov/news/features/food_chain).

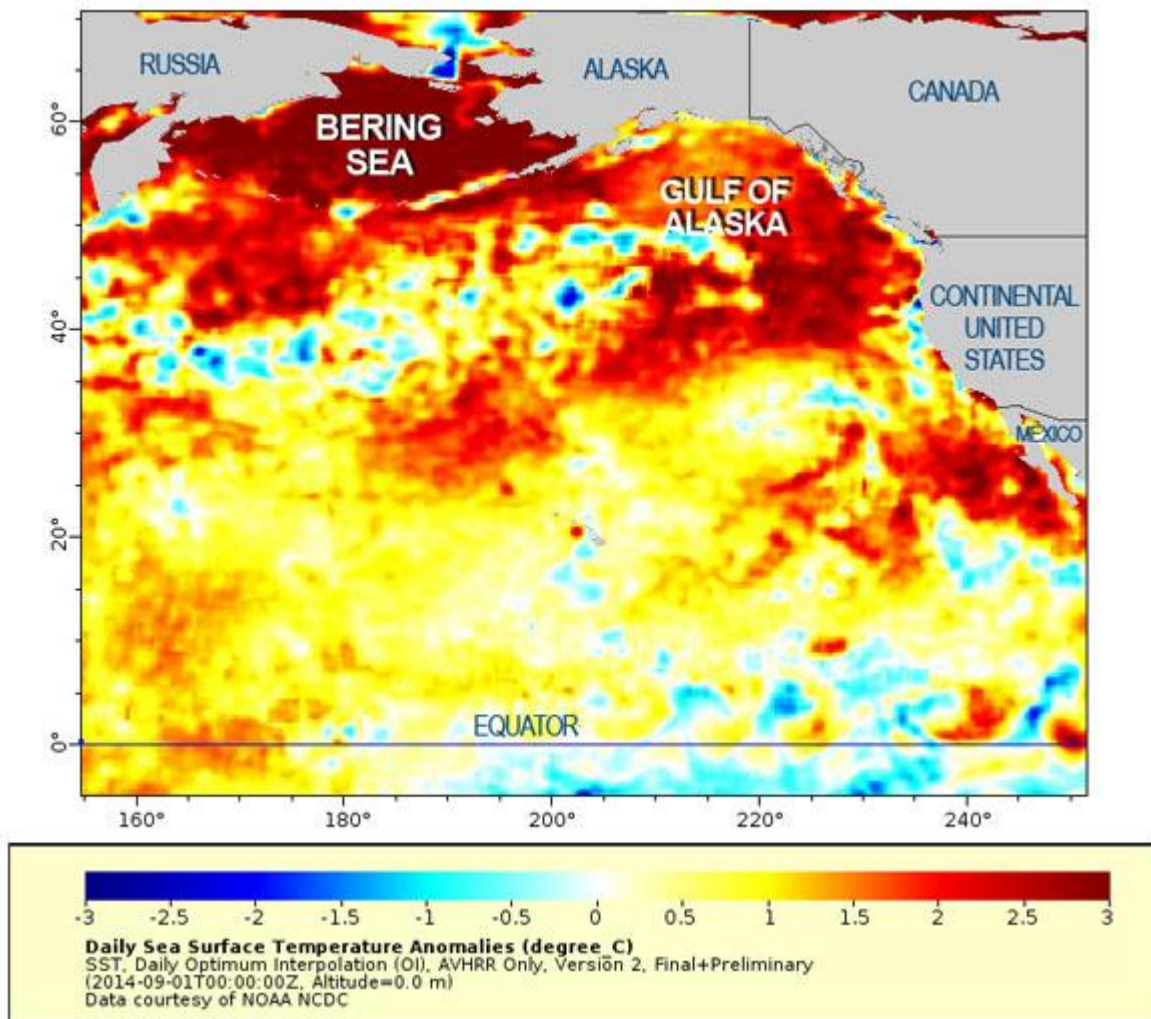


Fig. 3.9 Daily Sea Surface Temperature Anomalies (degree C)

Research into climatic variables and mechanisms that affect pollock recruitment (using recruitment estimates from the EBS assessment) investigated four hypotheses concerning the factors controlling pollock recruitment: 1) the “cold-pool” hypothesis (the extent of winter ice and subsequent cold pool formation); 2) the “oscillating control hypothesis” (relating pollock survival to characteristic spring blooms and predator abundance; 3) the “stability hypothesis” (related to water column stratification and wind stress); and 4) the “larval transport hypothesis” (related to surface-water advection influencing the degree of spatial separation between juveniles and cannibalistic adults). Notwithstanding the precise mechanisms, the pollock stock condition appears to have benefitted substantially from the recent conditions in the EBS. Temperature relations of age-0 pollock, along with interactions with available food in early-life stages, appears to have important implications for pollock recruitment success and appears to be creating a favourable stock trend in the near term (Ianelli 2016).

Together with physical information, information on wider biological environmental factors affecting the fishery is collected. To make this wide-ranging information accessible to stock assessment authors and managers, an Ecosystem Considerations chapter is prepared for BSAI and GOA Stock Assessment and Fishery Evaluation reports (Zador 2016a, b, c). The following are representative of the breadth of specific physical and ecological indicators of ecosystem status being tracked in each region with a time series from 1970 to present:

Bering Sea:

- North Pacific Index

- Ice retreat index
- Motile epifauna biomass
- Benthic and pelagic forager biomass
- Apex predator, seabird breeding indices and fur seal pups born at St Paul Island
- Extent of habitat affected by trawls

Aleutian Islands (subdivided into western central and eastern districts):

- Least auklet reproductive success and tufted puffin diet
- Pelagic forager and apex predator biomass
- Stellar sea lion non-pup counts
- Extent of habitat impacted by trawls

Gulf of Alaska

- Pacific decadal oscillation
- Zooplankton indices
- Capelin and apex fish biomass
- Kittiwake reproductive success
- Steller sea lion non-pup counts

These indices are used by scientists and managers to take account of wider environmental trends when considering TAC setting and other management decisions.

In addition, ecosystem modelling is relatively well developed, including the Bering Sea Regional Oceanographic Model (providing 9-month forecasts of oceanographic conditions) and the Forage Euphausiid Abundance in Space and Time (FEAST) model, concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock and also fur seals, chinook salmon, birds. Food web modelling using Ecopath/Ecosim has been carried out for EBS, AI and GoA which provides predominantly guild (i.e functional group) 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 such 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).

4 THE ASSESSMENT PROCESS

4.1 Original Assessment and Previous surveillance audits

The Alaska Bering Sea/Aleutian Islands and Gulf of Alaska Pacific Cod fisheries were first certified under the requirements of the Alaska Responsible Fisheries Management standard v1.2 on 17th of April 2013. The initial certification and three annual surveillance audits were carried out by the certification body Global Trust (GT).

April 2017, the certificate for this fishery was transferred from GT to the DNV GL. The certificate transfer and the fourth surveillance audit carried out by the DNV GL did not result in any changes in the compliance of the fishery with the RFM standard and the certificate remains valid until the original expiry date of 16 April 2018. No non-conformities were raised as the result of the fourth annual surveillance audit and the fishery will proceed to the full re-assessment against the new version of the Alaska Responsible Fisheries Management standard v1.3.

4.2 Stakeholder input

The re-assessment audit for this fishery was publicly announced on 16th of May 2017 and stakeholders were invited to register their interest to participate in the assessment of this fishery. No registration requests were received by the assessment team during this consultation opportunity.

The re-assessment audit was performed as an on-site audit in Anchorage, Juneau and Seattle, USA. The re-assessment activities were carried out by DNV GL team leader Anna Kiseleva and Fisheries experts Andrew Hough, Bill Brodie and Paul Knapman during 21 -28 June 2017. The assessment team gathered input from the various stakeholders, including: NPFMC, NMFS (including NMFS Habitat Division), Alaska Fisheries Science Centre, At Sea Processors Association, Alaska Fisheries Development Group, US Coast Guard and Alaska Department of Fish and Game. Information gathered is presented in this report and in the enclosed scoring tables (see Chapter 5 below).

5 ASSESSMENT OUTCOME / SCORING OF THE FUNDAMENTAL CLAUSES

5.1 A. The Fisheries Management System

<p>1. There shall be a structured and legally mandated management system based upon and respecting International, National and local fishery laws, for the responsible utilization of the stock under consideration and conservation of the marine environment. FAO CCRF (1995) 7.1.3/7.1.4/7.1.9/7.3.1/7.3.2/7.3.4/7.6.8/7.7.1/10.3.1 FAO Eco (2009) 28 FAO Eco (2011) 35, 37.3</p>			
<p>1.1 There shall be an effective legal and administrative framework established at local and national level appropriate for fishery resource conservation and management. The management system and the fishery operate in compliance with the requirements of local, national and international laws and regulations, including the requirements of any regional fisheries management agreement. FAO CCRF (1995) 7.7.1 FAO Eco (2009) 28 FAO Eco (2011) 35</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>The legal and administrative framework is not effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery do not operate in compliance with relevant fishery management requirements. Lacking in all parameters.</p>	<p>The legal and administrative framework is insufficiently effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate insufficiently in compliance with relevant fishery management requirements. Lacking in two parameters.</p>	<p>The legal and administrative framework is moderately effective, established, and appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate only moderately in compliance with relevant fishery management requirements. Lacking in one parameter.</p>	<p>Effective legal and administrative framework established at the local and national level is appropriate for fishery resource conservation and management. In addition, the management system and the fishery operate in compliance with the requirements of local, national and international laws and regulations, including the requirements of any regional fisheries management agreement. Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: Management agencies are physically and legally established at local and national level.</p> <p>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.</p> <p>Appropriateness/Effectiveness: The management framework is appropriate for managing the resource. For example, the larger the exploitation, vulnerability, or risks of a fish stock, the more work and precision shall be focused in managing the resource. This shall be done in compliance with legislative and regulatory requirements at the local, national and international level, including the requirements of any regional fisheries management agreement. The management system shall not be subject to continual unresolved or repeated disputes or political instability.</p> <p>Evidence Basis: Evaluate availability, quality, and adequacy of the evidence. Examples may include fishery management plans or other relevant information.</p>			
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause Process:</p>			

The Magnuson- Stevens Fishery Conservation and Management Act⁶¹ (Magnuson-Stevens Act or MSA) is the primary law governing marine fisheries management in US federal waters. The MSA, sets ten National Standards (NS) for fishery conservation and management (16 U.S.C. § 1851).

The National Marine Fisheries Service (NMFS) implements the MSA. NMFS is an office of the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce. NMFS may also be referred to as NOAA Fisheries⁶².

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

The North Pacific Fisheries Management Council⁶³ (NPFMC) is one of eight regional councils established by the MSA to manage fisheries in the US EEZ. The NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, fishery management plans (FMP) and any necessary amendments for each fishery under its authority that requires conservation and management actions. The NPFMC primarily manages groundfish in the BSAI⁶⁴ and GoA⁶⁵, targeting Pacific cod, pollock, flatfish, mackerel, sablefish, and rockfish species. The NPFMC offices are in Anchorage.

The Alaska Department of Fish and Game (ADFG) is the state department responsible for managing fish resources within state waters (0 – 3 nautical miles (nm)). The basis of natural resource management, including fish and fisheries is enshrined in Article VIII of the state constitution⁶⁶. The Department's Board of Fisheries (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 AS 16.05.251 including: establishing open and closed seasons and areas for taking fish; setting quotas, bag limits, harvest levels and limitations for taking fish; and establishing the methods and means for the taking of fish. The regulations the BOF has authority over are 5 AAC Chapters 1- 77

The ADF&G 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.⁶⁷

ADFG has 35 offices⁶⁸ throughout Alaska. The Headquarters are in Juneau.

Current status:

Trawl surveys have been conducted annually by NMFS-AFSC to assess the abundance of crab and groundfish in the Eastern Bering Sea since 1982 using standardized gear and methods on two chartered commercial fishing vessels. For P. 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 Gulf of Alaska. Starting in 2001, the survey frequency was increased from once

⁶¹ http://www.nmfs.noaa.gov/sfa/laws_policies/msa/

⁶² http://www.nmfs.noaa.gov/aboutus/our_mission.html

⁶³ <https://www.npfmc.org>

⁶⁴ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>

⁶⁵ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf>

⁶⁶ <http://ltgov.alaska.gov/services/alaskas-constitution/>

⁶⁷ <http://www.adfg.alaska.gov/index.cfm?adfg=about.structure>

⁶⁸ <http://www.adfg.alaska.gov/index.cfm?adfg=contacts.main>

every three years to every second year. The survey is conducted from chartered commercial bottom trawlers.

In addition to biological studies, stock survey and stock assessment reports, 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 NPFMC. Furthermore, the biological and oceanographic dynamics of the Alaska region are monitored to detect trends and potential sources of problems, such as overfishing or fishery-induced declines in species not targeted by commercial fisheries. The U.S. Coast Guard partners the NMFS's Office for Law Enforcement (OLE) to monitor, control and enforce fisheries regulations.

The NPFMC recommends regulations to govern the Pacific cod fisheries in the Alaska EEZ. NPFMC management measures include seasonal and spatial allocation of Total Allowable Catch (TAC), time and area restrictions (i.e. protected / conservation areas), Prohibited Species Catch (PSC) Limits, reporting and observers requirements. These are enforced by the Office of Law Enforcement (OLE) and the US Coast Guard (USCG).

In 1992, the Council created the Western Alaska Community Development Quota (CDQ) Program, to provide western Alaska communities an opportunity to participate in the BSAI fisheries. The CDQ Program allocates a percentage of all BSAI quotas for groundfish, prohibited species, halibut, and crab to eligible communities.

In Alaskan state waters (within 3 nm of the shoreline), there are 8 state-managed Pacific cod fisheries⁶⁹: 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 Guideline Harvest Levels (GHL) which, for Pacific cod, are based on 15-25% of Pacific cod ABC (3% Aleutian Island). 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.

Evidence basis:

The respective websites for: NMFS⁶² (NOAA fisheries), NPFMC⁶³, and ADFG⁷⁰ and annual FMPs for BSAI⁶⁴ and GoA⁶⁵ groundfish.

The OLE publishes a national annual report⁷¹ and the Alaska region submits six monthly reports to the NPFMC. As an example, see OLE 2017⁷² - Report for the period 1st October 2016 – 31st March 2017: for all fisheries, there were: 51 written warnings, 238 summary settlements and 1 criminal case. While the report does not distinguish which fishery the offences related to, none involved the Pacific cod fishery (pers. comm. Nathan Legerway - OLE).

The USCG publishes an annual report to the NPFMC on resources applied to fishery enforcement in the previous year, the number of boardings/inspections, the number of violations, lives lost at sea, safety issues, and any changes in regulations. The most recent report April – May 2017 (See Enforcement Committee webpage⁷³), indicates a low number of infractions: from a total of 93 boardings, all but one were related to safety equipment deficiencies, none were associated with the Pacific cod fishery.

The low occurrence of serious offences indicates that the Pacific cod fishery is generally compliant with regulations and the sanctions are considered to be an effective deterrent.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
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⁶⁹ http://www.adfg.alaska.gov/index.cfm?adfg=CommercialByFisheryGroundfish.groundfishmaps_management

⁷⁰ <http://www.adfg.alaska.gov/index.cfm?adfg=fishing.main>

⁷¹ http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf

⁷² <https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C>

⁷³ <https://www.npfmc.org/committees/enforcement-committee/>

Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Magnusson Stevens Act, 2007 http://www.nmfs.noaa.gov/sfa/laws_policies/msa/				
NOAA Fisheries http://www.nmfs.noaa.gov/aboutus/our_mission.html				
North Pacific Fisheries Management Council https://www.npfmc.org				
North Pacific Fisheries Management Council, BSAI Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf				
North Pacific Fisheries Management Council, BSAI Groundfish Management Plan https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf				
Article VIII of the Alaska State Constitution http://ltgov.alaska.gov/services/alaskas-constitution/				
ADFG Commercial Fisheries Divisions http://www.adfg.alaska.gov/index.cfm?adfg=about.structure				
Non-Conformance Number (if relevant):				

1.2 Management measures shall consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock.				FAO ECO (2009) 30.3 FAO ECO (2011) 37.3
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)	
Management measures do not consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. Lacking in all parameters.	Management measures insufficiently consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. Lacking in two parameters.	Management measures moderately consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. Lacking in one parameter.	Management measures consider 1) the whole stock biological unit (i.e. structure and composition contributing to its resilience) over its entire area of distribution, 2) the area through which the species migrates during its life cycle and 3) other biological characteristics of the stock. Fulfils all parameters.	
Evaluation Parameters				
Note on consideration of biological unity and other biological characteristics. Biological unity and biological characteristics shall be interpreted as relating to the stability or resilience of the stock – i.e. its ability to recover from or resist a shock or disturbance, such as the impact of a fishery. The management system must consider the relative ability of the stock to recover from or resist potential negative impacts. Characteristics considered shall include growth, fecundity, reproduction, lifespan, spawning cycle, population dynamics, impact of gear type, and essential habitat(s) needs and availability. Where life cycle and other biological characteristics are unknown, the management system shall ensure these uncertainties are factored into assessment and managing practices, as per the precautionary approach.				

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

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

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

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

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

Current Status/Appropriateness:

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 Stock Assessment and Fishery Evaluation (SAFE)^{74,75,76} 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 studies⁷⁷ 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 1994⁷⁸). The resource in the EBS and AI (BSAI) region had been managed as a single unit from 1977 through 2013, however, with recent research indicating the existence of discrete stocks in the EBS and AI (Spies 2012⁷⁹) separate harvest specifications have been set for the two areas since the 2014 season. 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 organisations 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 fishing mortality and are based on complete catch reporting systems including extensive observer data. Catches from fisheries occurring in state-managed waters are included in the appropriate assessments. All retained catch and discards of 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

⁷⁴ <https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf>

⁷⁵ <https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf>

⁷⁶ <https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf>

⁷⁷ https://www.afsc.noaa.gov/species/Pacific_cod.php

⁷⁸ <http://fishbull.noaa.gov/924/shimada.pdf>

⁷⁹ <http://www.tandfonline.com/doi/abs/10.1080/00028487.2012.711265>

the assessments. The AI Pacific cod assessment relies on survey biomass estimates and a simpler random effects model, although various age-structured models were examined and reported in the 2016 SAFE.

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 NPFMC. As outlined in the current NPFMC Groundfish FMPs^{80, 81} 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 website⁸². 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.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

- Fishwatch website <http://www.fishwatch.gov/profiles/pacific-cod>
- EBS Pacific cod SAFE Report <https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf>
- GOA Pacific cod SAFE Report <https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf>
- AI Pacific cod SAFE Report <https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf>
- Alaska Fisheries Science Centre, Pacific cod species profile https://www.afsc.noaa.gov/species/Pacific_cod.php
- Alaska Fisheries Science Centre, Groundfish stock assessments <https://www.afsc.noaa.gov/refm/stocks/assessments.htm>
- NPFMC GOA Groundfish FMPs <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf>
- NPFMC BSAI Groundfish FMPs <https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>
- Shimada and Kimura (1994) <http://fishbull.noaa.gov/924/shimada.pdf>
- Spies (2012) <http://www.tandfonline.com/doi/abs/10.1080/00028487.2012.711265>

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.3.1

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

⁸⁰ <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf>

⁸¹ <https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>

⁸² <https://alaskafisheries.noaa.gov/fisheries-catch-landings>

Evaluation Parameters

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

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

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

Evidence Basis: Documentary evidence is available supporting the above.

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

Process:

The NFMPC commits to: periodically review all critical components of the FMPs and maintain a continuing review of the fisheries managed under their FMPs; annually review objectives in the management policy statement; and, conduct a complete review of Essential Fish Habitat (EFH) once every 5 years and, in between, will solicit proposals on Habitat Areas of Particular Concern and/or conservation and enhancement measures to minimize potential adverse effects from fishing.⁷⁵

The NPFMC and BOF hold public meetings (the Council meets five times each year⁸³, usually in February, April, June, October and December; the BOF meetings generally occur from October through March, four to six times per year⁸⁴). 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, prohibited catch species (PSC) management measures to minimize the bycatch of halibut and Chinook salmon in the federal groundfish trawl fisheries are regularly reviewed⁸⁵.

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 (SSL). This includes closed areas that have not only been maintained through the years, but extended.

Evidence Basis:

The NPFMC FMPs (Table ES-2)^{64,65} 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^{83,86,87}. Similarly, the BOF websites have dedicated pages to their public meetings and agendas and outcomes reflect a commitment to review previously agreed management measures^{84,88}.

Conclusion:

⁸³ <https://www.npfmc.org/upcoming-council-meetings/>

⁸⁴ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo>

⁸⁵ <https://www.npfmc.org/goa-trawl-bycatch-management/>

⁸⁶ <https://www.npfmc.org/council-meeting-archive/>

⁸⁷ <https://www.npfmc.org/wp-content/PDFdocuments/meetings/threemeetingoutlook.pdf>

⁸⁸ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
<p>References: NOAA website catch and landing reports https://alaskafisheries.noaa.gov/fisheries-catch-landings EBS Pacific cod SAFE Report https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf GOA Pacific cod SAFE Report https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf AI Pacific cod SAFE Report https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf NPFMC GOA Groundfish FMPs http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfpmp.pdf NPFMC BSAI Groundfish FMPs https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf NPFMC Council Meeting Schedule https://www.npfmc.org/upcoming-council-meetings/ BOF meeting schedule http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo NPFMC salmon bycatch in GOA groundfish trawl fishery https://www.npfmc.org/goa-trawl-bycatch-management/ 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 review of meetings http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main</p>			
Non-Conformance Number (if relevant):			

NOT APPLICABLE			
<p>1.3 Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the applicant management organizations concerned shall cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.</p> <p>Lacking in two parameters.</p>	<p>There is moderate cooperation in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.</p> <p>Lacking in one parameter.</p>	<p>Where transboundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the applicant management organizations concerned cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock(s) in question.</p>

			Fulfils all parameters.	
Evaluation Parameters				
<p>Note: This clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Where sub-stocks are referred to as part of an overall stock there shall be sufficient information on biology, distribution, and life cycle that demonstrates the degree of association or disassociation, and basis for the management approach taken, to prevent recruitment failure of the stock or other negative impacts that are likely to be irreversible or very slowly reversible.</p> <p>Process: There is a mechanism in place by which the applicant organization(s) cooperates for the management of the transboundary stock. This mechanism has the sustainable international exploitation of the stock as its main objective.</p> <p>Current Status/Appropriateness/Effectiveness: There is evidence that the mechanism described in the process parameter is effective at ensuring the stock is sustainably exploited. This can take the form of evidence that the stock is not overfished or subject to overfishing across the entirety of the range of the biological stock.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include proof of formal agreements, records of meetings and decisions.</p>				
Evaluation (per parameter)/: General description of evidence in order to score the clause				
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.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

NOT APPLICABLE			
<p>1.3.1 Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks, shall be compatible. Compatibility shall be achieved in a manner consistent with the rights, competences and interests of the States concerned.</p> <p style="text-align: right;">FAO CCRF (1995) 7.1.3, 7.1.4, 7.1.5, 7.3.2, 10.3</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no compatibility of management measures for the stock in question.	There is insufficient compatibility of management measures for the stock in question.	There is moderate compatibility of management measures for the stock in question.	Conservation and management measures established for such stock within the jurisdiction of the relevant States for shared, straddling, high seas and highly migratory stocks, are compatible. Compatibility is achieved in a manner consistent with the rights, competences and interests of the States concerned.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	

			Fulfils all parameters.	
Evaluation Parameters				
Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Compatibility of management measures does not mean identical management measures but the approach shall be consistent with respect to the overall management and conservation goals of the shared or straddling stock.				
Process: Identification of common objectives for maintenance of stock biomass.				
Current Status/Appropriateness/Effectiveness: Implementation of measures fit to achieve the common objectives mentioned above (i.e., similar harvest rates based on stock status, common rebuilding objectives for depleted stocks).				
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include proof of formal agreements, records of meetings and decisions, stock assessment and other reports.				
Evaluation (per parameter)/: General description of evidence in order to score the clause				
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.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

NOT APPLICABLE			
1.4 A State not member/participant of a sub-regional or regional fisheries management organization shall cooperate, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization/arrangement.			
FAO CCRF 7.1.5			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The non-member or participant State is not giving effect to any relevant measures adopted by such organization or arrangement. Lacking in all parameters.	The non-member or participant State is insufficiently giving effect to any relevant measures adopted by such organization or arrangement. Lacking in two parameters.	The non-member or participant State is moderately giving effect to any relevant measures adopted by such organization or arrangement. Lacking in one parameter.	The State non-member or participant of a sub-regional or regional fisheries management organization cooperates, in accordance with relevant international agreements and law, in the conservation and management of the relevant fisheries resources by giving effect to any relevant measures adopted by such organization or arrangement. Fulfils all parameters.
Evaluation Parameters			

Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2.

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

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports detailing results of common surveys or acceptable harvest rates.

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

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.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

Non-Conformance Number (if relevant):

NOT APPLICABLE

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

FAO CCRF 7.3.5

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

			extent practicable, and take its views into account. Fulfils all parameters.
Evaluation Parameters Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Process: There is a history of prior consultation. Current Status/Appropriateness/Effectiveness: The views of the managing fishery organization are taken into account. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports detailing action taken by the state in question.			
Evaluation (per parameter)/: General description of evidence in order to score the clause 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.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

NOT APPLICABLE			
1.5 The Applicant fishery's management system shall actively foster cooperation between States with regard to 1) information gathering and exchange, 2) fisheries research, 3) fisheries management, and 4) fisheries development. FAO CCRF 7.3.4			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The Applicant fishery's management system does not actively foster cooperation between states. Lacking in all parameters.	The Applicant fishery's management system fosters insufficient cooperation between states with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. Lacking in two parameters.	The Applicant fishery's management system fosters moderate cooperation between states with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. Lacking in one parameter.	The Applicant fishery's management system fosters active international cooperation on fishery matters with regard to information gathering and exchange, fisheries research, fisheries management, and fisheries development. Fulfils all parameters.
Evaluation Parameters Note this clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Process: The extent to which a formal process or system is available.			

Current Status/Appropriateness/Effectiveness: Level of activity, application and level of engagement. Evidence Basis: Outputs from activity (e.g., reports, minutes, common or collective themes).				
Evaluation (per parameter)/: General description of evidence in order to score the clause 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.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

1.6 States and sub-regional or regional fisheries management organizations and arrangements, as appropriate, shall agree on the means by which the activities of such organizations and arrangements will be financed, bearing in mind, *inter alia*, the relative benefits derived from the fishery and the differing capacities of countries to provide financial and other contributions. Where appropriate, and when possible, such organizations and arrangements shall aim to recover the costs of fisheries conservation, management and research.
FAO CCRF 7.7.4

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

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

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

The federal budget cycle⁸⁹ can be summarised in the following steps:

1. Office of Management and Budget (OMB)⁹⁰ issues budget guidance NMFS submits its budget
2. Department of Commerce (DOC) and NOAA issue budget guidance
3. NMFS submits its budget to NOAA
4. NOAA submits its budget to DOC
5. DOC submits its budget to OMB
6. President's budget delivered to Congress
7. NOAA and DOC discuss the proposed budget with Congress
8. Deliberations by congressional appropriations committees
9. Budget execution
10. Spending and performance information sent to OMB – back to step 1

The state budget cycle⁹¹ can be summarised in the following steps:

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

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

Current Status/ Appropriateness/Effectiveness:

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

Section 304(d) of the MSA authorizes and requires the collection of cost recovery fees for limited access privilege programs and the Community Development Quota (CDQ) Program⁹². 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

⁸⁹ <http://www.fisheries.noaa.gov/sfa/management/councils/ccf/2017/feb/tab2-budget-update-acc.pdf>

⁹⁰ <https://www.whitehouse.gov/omb>

⁹¹ <http://akleg.gov/docs/pdf/budgproc.pdf>

⁹² https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.pdf

such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

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

Evidence Basis:

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

Agency	\$ million			
	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 – 17 th District		<40.2	<13.9	<26.3
Alaska Department of fish & Game (ADFG)		>2.5		

The budget for observer deployment in 2015⁹³ in the partial coverage category was \$5,758,268 for a total of 5,318 days. The budget for 2015 was made up of \$3,058,036 in fees (from 2014 landings) and \$2,700,232 in federal funds.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

Section 304(d) of the MSA - Community Development Quota (CDQ) Program
https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.pdf

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

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

ADFG annual budgets and performance <http://www.adfg.alaska.gov/index.cfm?adfg=about.budgets>

ADFG annual budgets, fisheries management component
https://www.omb.alaska.gov/ombfiles/17_budget/Fish/Proposed/rdu143.pdf

⁹³ <https://alaskafisheries.noaa.gov/sites/default/files/2015observerprogramannualreport.pdf>

Federal Budget Cycle - <http://www.fisheries.noaa.gov/sfa/management/councils/ccc/2017/feb/tab2-budget-update-acc.pdf>

Alaska State Budget Cycle <http://akleg.gov/docs/pdf/budgproc.pdf>

Non-Conformance Number (if relevant):

NOT APPLICABLE

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

FAO CCRF 7.8.1

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

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

Evaluation (per parameter)/: General description of evidence in order to score the clause
 The fishery takes place within the EEZ and so this clause is not applicable

Conclusion: NOT APPLICABLE

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

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

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

FAO CCRF 7.6.8

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

Evaluation Parameters

Process: There is a procedure to review management measures. The procedure includes the use of outcome indicators against which the success of management measures in achieving specific management objectives is measured. The procedure covers all management measures, including those relating to the sustainable exploitation of the target stock, the mitigation of negative impacts on non-target species through bycatch, discarding, and indirect effects, and the protection of ETP species and the physical environment.

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include data showing recent regulation revisions.

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

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

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

The adaptive management approach taken in the Alaska 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 as effectively as they might be the management system facilitates their revision. As a result, Amendments to the FMPs and changes in state regulations are introduced.

Evidence basis:

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

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

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

Council meetings are open, and public testimony – both written and oral – is taken on every issue prior to deliberations and final decisions. Public comments are also taken at all Advisory Panel and Scientific and Statistical Committee meetings. Written comments can be submitted. Any letters that are submitted are put in the Council notebooks. New issues to the Council, are usually addressed at the end of the meeting under an agenda item called “Staff Tasking.” The public are given a chance to comment on this items during an open forum⁹⁴.

The BOF also provides opportunity for input through public notification and their website⁹⁵ of upcoming meetings and opportunities to input into the management process.

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

The National Environmental Policy Act (NEPA)⁹⁶ requires agencies to prepare an Environmental

⁹⁴ <https://www.npfmc.org/how-do-i-get-involved/>

⁹⁵ <http://www.adfg.alaska.gov/index.cfm?adfg=process.comments>

⁹⁶ <https://www.epa.gov/nepa>

Impact Statement (EIS) on proposals for legislation and other major Federal actions that may significantly affect the quality of the human environment (40 CFR 1502.3). EISs are also prepared (1) when the proposed action is novel, (2) when there is controversy in the underlying science used to understand the impacts of the alternatives, or (3) when the potential impacts are unknown. All of the NPFMC proposed regulations and the FMPs include NEPA considerations⁹⁷. 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 65 times, and the GOA FMP has been amended 55 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)⁹⁸ was undertaken. This was a major review and analysis of the effect of the groundfish fisheries on the North Pacific Ecosystem and provided the NPFMC, NMFS, ADFG and stakeholders with information to further inform decision-making as to the consequences of the FMPs. In 2015, the NPFMC produced a PSEIS Supplemental Information Report⁹⁹ which updated the 2004 PSEIS.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

The NPFMC "Call for Proposals" process <https://www.npfmc.org/?s=call+for+proposal>

The BOF public notice of meetings <http://www.adfg.alaska.gov/index.cfm?adfg=process.comments>

The National Environmental Policy Act <https://www.epa.gov/nepa>

FMPs and NEPA considerations <https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews>

Programmatic Supplemental Environmental Impact Statement 2014
<https://alaskafisheries.noaa.gov/fisheries/groundfish-seis>

Programmatic Supplemental Environmental Impact Statement Information Report 2015
<https://alaskafisheries.noaa.gov/sites/default/files/sir-pseis1115.pdf>

Non-Conformance Number (if relevant):

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

- Management arrangements,
- Decision making.

FAO CCRF 7.1.9

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

⁹⁷ <https://www.epa.gov/nepa/fishery-management-guidance-national-environmental-policy-act-reviews>

⁹⁸ <https://alaskafisheries.noaa.gov/fisheries/groundfish-seis>

⁹⁹ <https://alaskafisheries.noaa.gov/sites/default/files/sir-pseis1115.pdf>

Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.												
<p>Evaluation Parameters</p> <p>Current Status: There is transparency in management arrangements.</p> <p>Effectiveness: There is transparency in decision making processes.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include records of the management arrangements and decision making processes.</p>															
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause</p> <p>Current Status: Management arrangements for the Alaska Pacific cod fisheries are easily accessible on the, NMFS¹⁰⁰ NPFMC^{64,65} and ADFG¹⁰¹ websites and from NMFS and ADFG offices as well as local offices of the Office of Law Enforcement (OLE)¹⁰² and Alaska State Wildlife troopers (AWT)¹⁰³.</p> <p>Effectiveness: The NPFMC imposes transparency so that all Council member’s discussions are open to the public. No more than a predetermined number of Council members can meet together unless the meeting is an open public meeting. Each Council decision is made by recorded vote in a public forum after public comment. Final decisions then go to the Secretary of Commerce for a second review, public comment, and final approval. Decisions must conform with the MSA, the NEPA, Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA) and other applicable law including several executive orders.</p> <p>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.</p> <p>Evidence Basis: The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all Council and BOF deliberations are conducted in open, public session. Anyone may submit regulatory proposals, and all such proposals are given due consideration by both the NPFMC and the BOF.</p> <p>The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process (NPFMC 2009¹⁰⁴) and the Council Operating Procedures (NPFMC 2012a).</p>															
<p>Conclusion:</p> <table border="1"> <tr> <td>Evidence Rating:</td> <td>Low <input type="checkbox"/></td> <td>Medium <input type="checkbox"/></td> <td>High <input checked="" type="checkbox"/></td> </tr> <tr> <td>Non-Conformance:</td> <td>Critical <input type="checkbox"/></td> <td>Major <input type="checkbox"/></td> <td>Minor <input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td></td> <td>None <input checked="" type="checkbox"/></td> </tr> </table>				Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>				None <input checked="" type="checkbox"/>
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>												
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>												
			None <input checked="" type="checkbox"/>												
<p>References:</p> <p>NOAA website regulations https://alaskafisheries.noaa.gov/fisheries/regs-amds</p> <p>NPFMC GOA Groundfish FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf</p> <p>NPFMC BSAI Groundfish FMP https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf</p> <p>ADFG regulations http://www.adfg.alaska.gov/index.cfm?adfg=regulations.main</p>															

¹⁰⁰ <https://alaskafisheries.noaa.gov/fisheries/regs-amds>

¹⁰¹ <http://www.adfg.alaska.gov/index.cfm?adfg=regulations.main>

¹⁰² http://www.nmfs.noaa.gov/ole/about/what_we_do.html

¹⁰³ <http://dps.alaska.gov/AWT/>

¹⁰⁴ https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

Office of Law Enforcement website http://www.nmfs.noaa.gov/ole/about/what_we_do.html

Alaska State Wildlife Troopers website <http://dps.alaska.gov/AWT/>

NPFMC 2009, Navigating the Council Process https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

Non-Conformance Number (if relevant):

NOT 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 8.2.6

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

Evaluation Parameters

Not Applicable if the fishery does not occur in high seas.

Process: The Agreement is accepted and relevant regulation adopted.

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on the management of high seas fishing activities.

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

The Alaska Pacific cod fishery does not occur on the high sea and so this clause is not applicable.

Conclusion: NOT APPLICABLE

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>

References:

Non-Conformance Number (if relevant):

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

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

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

FAO CCRF (1995) 10.1.1, 10.1.3, 10.2.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>An appropriate policy, legal and institutional frameworks is not adopted in order to achieve sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas.</p> <p>Lacking in all parameters.</p>	<p>Policy, legal and institutional frameworks have been adopted but are insufficient to achieve sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas.</p> <p>Lacking in two parameters.</p>	<p>Policy, legal and institutional frameworks have been adopted but are moderately achieving sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas.</p> <p>Lacking in one parameter.</p>	<p>An appropriate policy, legal and institutional framework has been adopted in order to achieve sustainable and integrated use of living marine resources, taking into account 1) the fragility of coastal ecosystems and finite nature of their natural resources; 2) allowing for determination of the possible uses of coastal resources and govern access to them, 3) taking into account the rights and needs of coastal communities and their customary practices to the extent compatible with sustainable development. In setting policies for the management of coastal areas, States 4) take due account of the risks and uncertainties involved.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

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

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

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

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

Process:

The Coastal Zone Management Act 1972 (as amended)¹⁰⁵ (CZMA) (16 U.S.C. 1451 et seq.) was designed to encourage and assist states in developing coastal management programs, to coordinate state activities, and to safeguard regional and national interests in the coastal zone. The Alaska Coastal Management Program (ACMP) was approved by NOAA in 1979 as a voluntary state partner in the National Coastal Management Program. However, in 2011 Alaska withdrew from the program. As a result, coastal zone management matters are addressed at a federal level in accordance with the policies set forth in NEPA.

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

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

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

Current Status/Appropriateness/Effectiveness:

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

The NPFMC and the BOF system was designed so that fisheries management decisions were made at the regional level to allow input from affected stakeholders. NPFMC meetings are open, and public testimony is taken on issues prior to deliberations and final decisions. In so doing, the management organizations within Alaska and their management processes take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development^{106,107}.

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

¹⁰⁵ <https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg1280.pdf>

¹⁰⁶ <https://www.npfmc.org/summary-reports/>

¹⁰⁷ <https://www.npfmc.org/wp-content/PDFdocuments/resources/MSA40Booklet.pdf>

Evidence Basis:

NOAA has set out their policy and procedures for compliance with NEPA¹⁰⁸ which explicitly sets out NEPA procedures in relations to fisheries. The NMFS Alaska region website also includes all the on-going EFH consultations in relation to coastal development proposals¹⁰⁹.

As well as the NPFMC and BOF meeting process allowing for coastal zone management and any community concerns or needs to be formally aired within a public forum. The NMFS and ADFG websites¹¹⁰ also provide information on their input into planning processes.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

Coastal Zone Management Act 1972 <https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg1280.pdf>

NPFMC website with summary of Council publications <https://www.npfmc.org/summary-reports/>

NPFMC publication "Celebrating 40 years of sustainable fisheries" <https://www.npfmc.org/wp-content/PDFdocuments/resources/MSA40Booklet.pdf>

NOAA policy and procedures for compliance with NEPA https://alaskafisheries.noaa.gov/sites/default/files/noaa_nepa_companion_guide.pdf

NMFS Alaska region EFH consultations https://alaskafisheries.noaa.gov/habitat-consultations/search?search_api_views_fulltext=

ADFG Planning process <http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions>

Non-Conformance Number (if relevant):

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

FAO CCRF 10.4.1

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

¹⁰⁸ https://alaskafisheries.noaa.gov/sites/default/files/noaa_nepa_companion_guide.pdf

¹⁰⁹ https://alaskafisheries.noaa.gov/habitat-consultations/search?search_api_views_fulltext=

¹¹⁰ <http://www.adfg.alaska.gov/index.cfm?adfg=habitatoversight.planrevisions>

			Fulfils all parameters.
<p>Evaluation Parameters</p> <p>Process: There is a mechanism to allow cooperation between neighboring countries to improve coastal resource management.</p> <p>Current Status/Appropriateness/Effectiveness: There are records of cooperation. Examples may include fishery, aquaculture, or other agreements or records from international fora.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports or data on the international cooperation/information exchange in these events.</p>			
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause</p> <p>Process, Current Status/Appropriateness/Effectiveness, Evidence Basis</p> <p>The only other coastal state in the Bering Sea is Russia. Given the distance between the more populated regions of each country is vast, the need for a mechanism to allow for cooperation between neighbouring countries to improve coastal resource management is not applicable in this instance.</p> <p>Canada abuts the US border to the south and shares fisheries resources. In this instance, the Pacific cod stock is not considered toThe US and Canada have a very strong working relationship at both the national and regional levels. In cases involving boundary disputes and treaties governing fishery access, the USCG, NOAA and Canadian Department of Fisheries and Oceans (DFO) along with Canadian Coast Guard (CCG) counterparts have effectively coordinated living marine resource enforcement efforts despite occasional related political and economic tensions.</p> <p>There are established agreements and shared management and working practices, e.g. International Pacific Halibut Commission¹¹¹, Pacific Salmon Treaty¹¹², Agreement between the US and Canada on enforcement¹¹³.</p>			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
<p>International Pacific Halibut commission http://www.iphc.int</p> <p>Pacific Salmon Treaty http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/</p> <p>Agreement between the US and Canada on enforcement http://www.nmfs.noaa.gov/ia/agreements/LMR%20report/us_canada_fisheries_enforcement.pdf</p>			
Non-Conformance Number (if relevant):			

2.1.2 States shall ensure that the authority or authorities representing the fisheries sector in the coastal management process have the appropriate technical capacities and financial resources.			
FAO CCRF (1995) 10.4.2			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no access to appropriate technical	There is insufficient access to appropriate	There is moderate access to appropriate	The State ensures that the authority or

¹¹¹ <http://www.iphc.int>

¹¹² <http://www.psc.org/about-us/history-purpose/pacific-salmon-treaty/>

¹¹³ http://www.nmfs.noaa.gov/ia/agreements/LMR%20report/us_canada_fisheries_enforcement.pdf

capacities and financial resources. Lacking in all parameters.	technical capacities and financial resources. Lacking in two parameters.	technical capacities and financial resources. Lacking in one parameter.	authorities representing the fisheries sector in the coastal management process have the appropriate technical capacities and financial resources. Fulfils all parameters.
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Evaluation Parameters

Process: There are appropriate technical capacities and financial resources.

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports or data overall operating staff and financial resources/budgets available.

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

Process:

The technical capacities of the federal and state agencies involved in the management of the Alaska Pacific cod fisheries 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, NPFMC 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 under clause 1.6 above.

NMFS and AFDG staffing complement are available on their respective websites^{114,115}.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

NMFS Alaska Region staff structure <https://alaskafisheries.noaa.gov/sites/default/files/akorgchart.pdf>

ADFG Staff structure <http://www.adfg.alaska.gov/index.cfm?adfg=about.structure>

Non-Conformance Number (if relevant):

2.2 Representatives of the fisheries sector and fishing communities shall be consulted in the decision making processes involved in other activities related to coastal area management planning and development. The public shall also be kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected.

FAO CCRF (1995) 10.1.2, 10.2.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
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¹¹⁴ <https://alaskafisheries.noaa.gov/sites/default/files/akorgchart.pdf>

¹¹⁵ <http://www.adfg.alaska.gov/index.cfm?adfg=about.structure>

<p>There is no consultation with the fishery sector and fishing communities, and no attempts to create public awareness.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient consultation with the fishery sector and fishing communities, and insufficient attempts to create public awareness.</p> <p>Lacking in two parameters.</p>	<p>There is moderate consultation with the fishery sector and fishing communities, and moderate attempts to create public awareness.</p> <p>Lacking in one parameter.</p>	<p>Representatives of the fisheries sector and fishing communities are consulted in the decision making processes involved in other activities related to coastal area management planning and development. The public is also kept aware on the need for the protection and management of coastal resources and the participation in the management process by those affected.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Process: Describe how fishery related information is disseminated and the process in place to consult with fishery sector and fishing communities.
Current Status/Appropriateness/Effectiveness: There are records of consultations with fishing communities and the fisheries sector. Attempts have been made to create public awareness on the need for protection and management of coastal resources, and those affected by the management process have been made aware of its provision.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include public records of consultation activities and other available documentation, published on the internet or distributed at public meetings.

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

Process:
The NMFS and the NPFMC participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes^{116, 117}. These include consultation, and decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. To implement NEPA’s policies, Congress prescribed a procedure, commonly referred to as “the NEPA process” or “the environmental impact assessment process.” The NEPA processes provide public information and opportunity for stakeholder involvement at both the state and federal levels. In this way, any application for a permit to undertake an activity or development in the coastal region, requires the agency that is being asked to issue the permit to evaluate the environmental effects of the permit and follow the NEPA process.

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

Current Status/Appropriateness/Effectiveness:
All the fishery agencies have processes, committees and groups that allow coastal zone resource management issues to be brought to formal review and engagement. As well as the NPFMC and BOF public meetings being key forums for consulting and creating awareness of issues to do with coastal resource management and their potential impact on fish stocks and socio-economic interests, the Council has established a rural 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

¹¹⁶ <https://alaskafisheries.noaa.gov/fisheries/nepa-guidance>

¹¹⁷ http://www.nmfs.noaa.gov/sfa/management/councils/training/2016/2016%20Presentations/jh_nepa_overview_acc.pdf

issues and how they may get involved and contribute to the decision-making process. At the State level, land use and access planning is considered to be a collaborative and adaptive process by which land managers, biologists, members of the public, and local stakeholder groups work together to produce [State Area and Management Plans](#) that guide and inform the day-to-day decisions that impact the use and development of Alaska’s land and water resources.

Evidence Basis:

The NPFMC and BOF websites actively encourage and demonstrate participation by stakeholders at their respective public meetings and cover a wide range of topics regarding the use, development and management of coastal resources. Furthermore, the Council and ADFG are statutorily obliged to establish or participate in more regional or local fora in order to engage stakeholders and encourage their contribution to the decision-making process ^{118,119,120,121}.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

NPFMC upcoming meetings and topics <https://www.npfmc.org/upcoming-council-meetings/>

NPFMC website encouraging stakeholder participation <https://www.npfmc.org/how-do-i-get-involved/>

NOAA Alaska Region – NEPA guidance <https://alaskafisheries.noaa.gov/fisheries/nepa-guidance>

NMFS Powerpoint on NEPA process
http://www.nmfs.noaa.gov/sfa/management/councils/training/2016/2016%20Presentations/jh_nepa_overview_acc.pdf

BOF meetings <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

BOF “Proposal Book”, inviting topics for discussion at BOF public meetings
<http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook>

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

ADFG participation in coastal and land use planning
<http://www.adfg.alaska.gov/index.cfm?adfg=access.planning>

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.5, 10.1.4, 10.15

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Practices for the avoidance of conflict	Practices have been adopted but are	Practices have been adopted but are	Fisheries practices that avoid conflict among

¹¹⁸ <https://www.npfmc.org/upcoming-council-meetings/>

¹¹⁹ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main>

¹²⁰ <https://www.npfmc.org/committees/rural-outreach-committee/>

¹²¹ <http://www.adfg.alaska.gov/index.cfm?adfg=access.planning>

<p>between fishers and other coastal users have not been adopted and fishing gear is not regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms are not established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.</p> <p>Lacking in all parameters.</p>	<p>largely ineffective to avoid conflict between fishers and other coastal users, and fishing gear is insufficiently regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms are insufficiently established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.</p> <p>Lacking in two parameters.</p>	<p>moderately effective in avoiding conflict between fishers and other coastal users, and fishing gear is moderately regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Furthermore, procedures and mechanisms are moderately established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.</p> <p>Lacking in one parameter.</p>	<p>fishers and other users of the coastal area (e.g. aquaculture, tourism, energy) are adopted and fishing is regulated in such a way as to avoid risk of conflict among fishers using different vessels, gear and fishing methods. Procedures and mechanisms are established at the appropriate administrative level to settle conflicts which arise within the fisheries sector and between fisheries resource users and other coastal users.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Process: These practices have been adopted, and there is a process to regulate fishing gear, methods and vessels so as to avoid risk of conflict. If conflict arise, there is process that allows to settle conflicts between fishery users and other users.
Current Status/Appropriateness/Effectiveness: Describe these practices and their effectiveness within the fishery sector, and between fishers and other coastal users.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws and regulations or other documents.

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

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

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

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

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

Current Status/Appropriateness/Effectiveness:
A suite of management measures are in place for the cod fisheries, that may contribute to minimizing conflict with other sectors or coastal users, for example, area restrictions are in place, e.g. around SSL rookeries; coordinated season timing is used to spread out fishing effort over the year thereby

helping to minimise gear conflicts, and allow participation by all elements of the groundfish fleet; the cod fishery is subject to prohibited species catch (PSC) limits.

Evidence basis:

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

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

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

NPFMC process and how stakeholders can get involved <https://www.npfmc.org/wp-content/PDFdocuments/meetings/IntrotoProcess.pdf>

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

NMFS FMP Amendments <https://alaskafisheries.noaa.gov/fmp-amendments>

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.1.10

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

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

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

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

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

Evidence Basis:
The MSA requires Councils to hold public meetings within their respective regions to discuss the development and amendment of FMPs. These meetings are publicised by the NPFMC and stakeholders actively encouraged to participate changes and allow input from stakeholders.¹²²

The BOF website publishes information on forth-coming BOF meetings including the “Proposal Book”¹²³ which details proposed ADFG or stakeholder requested changes that might lead to regulatory change. Stakeholders are actively encouraged to participate at the meetings and submit proposal prior to the meetings.

The OLE and AWT put an emphasis on educating ad informing stakeholders of new regulatory changes and other important fishery related matters (pers. comm. Nathan Lagerwey - OLE).

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:
NPFMC Home Page <https://www.npfmc.org>
ADFG Home Page <http://www.adfg.alaska.gov>

¹²² <https://www.npfmc.org/how-do-i-get-involved/>

¹²³ <http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook>

NPFMC website encouraging stakeholder participation <https://www.npfmc.org/how-do-i-get-involved/>

BOF meetings including the "Proposal Book"
<http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook>

Non-Conformance Number (if relevant):

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

FAO CCRF 10.2.2

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

Evaluation Parameters

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

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on social/cultural/economic value of the resource.

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

Process:

The Community Development Quota (CDQ) Program¹²⁴ was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. The purpose of the CDQ Program is: (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. The program involves eligible communities who have formed six regional organizations, referred to as CDQ groups. There are 65 communities within a fifty-mile radius of the Bering Sea coastline who participate in the program. The CDQ program allocates a percentage of the BSAI quotas to CDQ groups, including Pacific cod, pollock, halibut, crab and bycatch species.

Current Status/Appropriateness/Effectiveness:

The program is reviewed every ten years. The last review of the CDQ program was 2012¹²⁵. The program is reviewed every ten years¹²⁶. Analysis by the State of Alaska in 2013, determined that each CDQ entity had maintained or improved performance against its objectives.

Evidence basis:

¹²⁴ <https://alaskafisheries.noaa.gov/fisheries/cdq>

¹²⁵ <https://alaskafisheries.noaa.gov/fisheries/cdq-review>

¹²⁶ <https://alaskafisheries.noaa.gov/fisheries/cdq-review>

As indicated under 2.1.1 above the CDQ program provides an example of how the management system takes account of the allocation and use of coastal resources with respect to their economic, social and cultural value.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

The Community Development Quota (CDQ) Program <https://alaskafisheries.noaa.gov/fisheries/cdq>
 CDQ review <https://alaskafisheries.noaa.gov/fisheries/cdq-review>

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 10.2.4, 10.2.5, 10.3.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems to monitor coastal environment using multidisciplinary research.	There is insufficient cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems to monitor coastal environment using multidisciplinary research.	There is moderate cooperation at the sub-regional level in order to improve coastal area management and /or establishment or promotion of systems to monitor coastal environment using multidisciplinary research.	There is cooperation at the sub-regional level in order to improve coastal area management, and in accordance with capacities, measures are taken to establish or promote systems for research and monitoring of the coastal environment, in order to improve coastal area management, and promote multidisciplinary research in support and improvement of coastal area management using physical, chemical, biological, economic, social, legal and institutional aspects.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is a system at the sub regional level that allows research and monitoring of the coastal environment and multidisciplinary research in support of coastal area management is promoted.

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on the status of the coastal area using the various aspects listed above.

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

Process:

A considerable amount of monitoring of the coastal environment in Alaska is performed and supported by multiple federal and state agencies, e.g. NMFS, AFSC, ADFG, institutions of higher learning, e.g. the University of Alaska Fairbanks Institute of Marine Science¹²⁷ and organisations that support and facilitate marine research, e.g. North Pacific Research Board¹²⁸

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 (EMA), with an overall goal to improve and reduce uncertainty in stock assessment models of commercially important fish species through the collection of observations of fish and oceanography. These fish and oceanographic observations are used to connect climate change and variability in large marine ecosystems to early marine survival of commercially important fish species in the GOA, EBS, AI and Arctic. The goal for this assessment is to develop models relating these fisheries-oceanographic indices to productivity of commercially important fish species (such as Pacific cod, pollock, herring, western Alaska salmon) in the southeastern Bering Sea. The program is supported through partnerships in regional research programs such as the North Pacific Research Board, North Pacific Anadromous Fish Commission's Bering Aleutian Salmon International Survey (BASIS), the Bering Sea Fisherman's Association, the Alaska Sustainable Salmon Fund, and the Arctic Yukon Kuskokwim Sustainable Salmon Fund and the Alaska Ocean Observation System.

NMFS, Alaska Region, Fisheries' Habitat Conservation Division¹²⁹ (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on Essential Fish Habitat (EFH) and living marine resources in Alaska. This work includes conducting and/or reviewing environmental analyses for a large variety of activities ranging from commercial fishing to coastal development to large transportation and energy projects. HCD identifies technically and economically feasible alternatives and offers realistic recommendations for the conservation of valuable living marine resources. HCD focuses on activities in habitats used by federally managed fish species located offshore, nearshore, in estuaries, and in freshwater areas important to anadromous salmon.

NOAAs Pacific Marine Environmental Laboratory¹³⁰ (PMEL) undertakes marine ecosystem research focusing on measuring, understanding, and predicting impacts of natural physical, chemical, biological, geological, and anthropogenic processes on the oceanic web of life. A sub-set of their work known as "Oceans and Coastal Processes Research" includes an understanding of ocean physics and interactions between the ocean, the seafloor and atmosphere.

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

¹²⁷ <http://www.uaf.edu/cfos/research/institute-of-marine-scienc/>

¹²⁸ <http://www.nprb.org>

¹²⁹ <https://alaskafisheries.noaa.gov/habitat>

¹³⁰ <https://www.pmel.noaa.gov>

As a result the NPRB have helped fund two major projects in the Alaska region:
 The Bering Sea Project¹³¹, is a partnership between the NPRB and the National Science Foundation¹³², which seeks to understand the impacts of climate change and dynamic sea ice cover on the eastern Bering Sea ecosystem. More than 50 scientists from 11 institutions are taking part in the \$17.6 million.

The Gulf of Alaska Ecosystem Study, examines the physical and biological mechanisms that determine the survival of juvenile groundfish in the Gulf of Alaska. Field work was conducted through 2010-14 and a synthesis is underway and expected to be completed in 2018 producing products that apply the results to fisheries management.

The University of Alaska Fairbanks, Institute of Marine Science (IMS) conducts research within the Alaska region through a range of fisheries and ocean science disciplines¹³³, including marine, estuarine and freshwater ecosystems and their related human dimensions.

Evidence Basis:

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

University of Alaska Fairbanks Institute of Marine Science (IMS)
<http://www.uaf.edu/cfos/research/institute-of-marine-scienc/>

IMS fisheries and ocean science disciplines <http://www.uaf.edu/cfos/research/institute-of-marine-scienc/reasearch-projects/>

North Pacific Research Board (NPRB) <http://www.nprb.org>

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

NOAAs Pacific Marine Environmental Laboratory <https://www.pmel.noaa.gov>

NPRB: The Bering Sea Project <http://www.nprb.org/bering-sea-project/about-the-project/>

National Science Foundation <https://www.nsf.gov>

Alaska Ocean Observation System <http://www.aos.org>

Non-Conformance Number (if relevant):

NOT APPLICABLE

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

FAO CCRF (1995) 8.11.3

¹³¹ <http://www.nprb.org/bering-sea-project/about-the-project/>

¹³² <https://www.nsf.gov>

¹³³ <http://www.uaf.edu/cfos/research/institute-of-marine-scienc/reasearch-projects/>

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

Evaluation Parameters

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

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

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

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

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

Not applicable to the Pacific cod fishery.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input type="checkbox"/>

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 10.3.2

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

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

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

Process
 The risk of oil pollution¹³⁴ and polluted water from coastal mining tailings^{135 136} 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 Force¹³⁷ 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 Response¹³⁸ (SPAR) prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment. Given their experience with the Exxon Valdez oil tanker disaster in 1989, Alaskans have made significant progress in the safe handling, storage, and transportation of oil and chemicals and the cleanup of historical contamination.

The US and Russia also have a bi-lateral agreement¹³⁹, signed in 1989, concerning cooperation in combating pollution in the Bering and Chukchi Seas in emergency situations, 1989.

Evidence basis:
 Pacific States / British Columbia Oil Spill Task Force produce annual reports¹⁴⁰ which include, prevention, preparedness, response and communication updates as well as jurisdictional reviews of the US member states and British Columbia.

¹³⁴ <https://alaskafisheries.noaa.gov/sites/default/files/oilspillfactsheet1114.pdf>

¹³⁵ <http://www.fpir.noaa.gov/Library/HCD/EFH%20Non-fishing%20NW-SW%202003.pdf>

¹³⁶ <https://alaskafisheries.noaa.gov/sites/default/files/impactstoefh112011.pdf>

¹³⁷ <http://oilspilltaskforce.org>

¹³⁸ <https://dec.alaska.gov/spar/>

¹³⁹ www.dec.state.ak.us/spar/perp/plans/uc/mou/Kp- US_USSR_89.pdf

¹⁴⁰ http://oilspilltaskforce.org/wp-content/uploads/2017/05/OSTF_annualreport.onscreen.loresCORRECTED.pdf

The agreement between the US and Russia for combating oil pollution can be found on the internet.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

OAA Fact Sheet on Oil Pollution

<https://alaskafisheries.noaa.gov/sites/default/files/oilspillfactsheet1114.pdf>

Non-fishing Impacts to Essential Fish Habitat <http://www.fpir.noaa.gov/Library/HCD/EFH%20Non-fishing%20NW-SW%202003.pdf>

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

US Pacific States / British Columbia Oil Spill Task Force produce annual reports

<http://oilspilltaskforce.org/wp-content/uploads/2017/05/OSTF.annualreport.onscreen.loresCORRECTED.pdf>

State of Alaska, Department of Environmental Conservation, Division of Spill Prevention and Response SPAR) <https://dec.alaska.gov/spar/>

Non-Conformance Number (if relevant):

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

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

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

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

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



		Lacking in one parameter.
<p>Evaluation Parameters</p> <p>Process: Management objectives based on the best available scientific evidence (which can include traditional knowledge, if verifiable) have been translated into a fishery management plan or similar document.</p> <p>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.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plan/framework or legal rules.</p>		
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause</p> <p>Process / Evidence Basis: Under the MSA, the NPFMC is required to prepare and submit a FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs have to be consistent with ten national standards for fishery conservation and management (16 USC § 1851)¹⁴¹.</p> <p>Current Status/Appropriateness/Effectiveness The NPFMC 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:</p> <ol style="list-style-type: none"> 1. Prevent Overfishing: <ul style="list-style-type: none"> • Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield. • Continue to use the 2 million t optimum yield cap for the BSAI groundfish fisheries. • Provide for adaptive management by continuing to specify optimum yield as a range. • Provide for periodic reviews of the adequacy of F40% and adopt improvements, as appropriate. • Continue to improve the management of species through species categories. 2. Promote Sustainable Fisheries and Communities: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 		

¹⁴¹ <https://www.law.cornell.edu/uscode/text/16/1851>

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

5. Avoid Impacts to Seabirds and Marine Mammals:

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

6. Reduce and Avoid Impacts to Habitat:

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

7. Promote Equitable and Efficient Use of Fishery Resources:

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

8. Increase Alaska Native Consultation:

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

9. Improve Data Quality, Monitoring and Enforcement:

- Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
- Develop funding mechanisms that achieve equitable costs to the industry for implementation of the North Pacific Groundfish Observer Program.
- Improve community and regional economic impact costs and benefits through increased data reporting requirements.
- Increase the quality of monitoring and enforcement data through improved technology. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.

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

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

- Minimise 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
- Utilise 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 NPFMC

These principles are considered by the assessment team to equate to objectives.

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 (5 ACC 28.081)¹⁴²

Evidence basis:

In combination, the requirement for the NPFMC 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.

The state waters Pacific cod management plan have, apparently, been developed and implemented on the basis of guiding principles developed for BOF groundfish management plans more than 20 years ago. It is recommended that the BOF review the guiding principles and more explicitly state them in their Management Plans.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

MSA section (16 USC § 1851)
<http://www.touchngo.com/lqcntr/akstats/aac/title05/chapter028/section263.htm>

State Waters Pacific cod Management Plans (5 ACC 28.081)
http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groun dfish.pdf

¹⁴² http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groundfish.pdf

BOF 1996, Meeting record- "Findings from State Waters Pacific Cod Management Plan" Oct 1996, Wasilla.

Non-Conformance Number (if relevant):

3.2 Management measures shall provide, inter alia, that:

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

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

Evaluation Parameters

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

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery reports on harvest recommendation and harvest or fleet reports.

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

Process

In 1995, the NPFMC adopted the Alaska Licence Limitation Program¹⁴³ (LLP). The intent of the program has been to use fishing track record to rationalise the Alaska groundfish and crab fleet by limiting the number, size and specific operation of vessels as well as eliminating latent licences.

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

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

There are four exceptions to the LLP license requirement:

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

Current Status/Appropriateness/Effectiveness:

Groundfish licenses are currently required to participate in the BSAI groundfish fisheries in Federal

¹⁴³ <https://alaskafisheries.noaa.gov/fisheries/llp>

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 $\geq 60'$ 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 Gulf of Alaska groundfish fisheries are among the few remaining limited access (not rationalised) 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 ft in length), and 50 mt for large vessels (≥ 60 ft 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 a 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 NPFMC website includes a page describing the development and evolution of the Pacific cod allocation and fleet sectors.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

North Pacific Licence Limitation Program <https://alaskafisheries.noaa.gov/fisheries/llp>
 Pacific cod allocations <https://www.npfmc.org/pacific-cod-allocations/>
 Annual Management Report for Groundfish Fisheries in the Kodiak, Chignik, and South Alaska Peninsula Management Areas
<http://www.adfg.alaska.gov/FedAidPDFs/FMR15-41.pdf>
 Annual Management Report for Groundfish Fisheries in the Prince William Sound
<http://www.adfg.alaska.gov/FedAidpdfs/FMR13-30.pdf>

Non-Conformance Number (if relevant):

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

Low Confidence Rating	Medium Confidence Rating	Medium Confidence Rating	High Confidence Rating
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(Critical NC)	(Major NC)	(Minor NC)	(Full Conformance)
<p>There is an absence of favorable economic conditions that promote responsible fishing.</p> <p>Lacking in all parameters.</p>	<p>There is an insufficient presence of favorable economic conditions that promote responsible fishing.</p> <p>Lacking in two parameters.</p>	<p>There is a moderate presence of favorable economic conditions that promote responsible fishing.</p> <p>Lacking in one parameter.</p>	<p>The economic conditions under which fishing industries operate promote responsible fisheries.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: Where best available scientific evidence determines that it is necessary, there are management measures in place to ensure the economic conditions under which the fishery operates promote responsible fisheries.</p> <p>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.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include economic reports or enforcement data.</p>			
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause</p> <p>Process</p> <p>National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and NPFMC follow a multi-faceted precautionary approach (OFL, ABC, TAC, OY) to manage the federal Pacific cod fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations (e.g. the OY limits). The fisheries management system is supported by strong science and the biomass of Pacific cod stocks has been maintained well above the limit reference points, and thus management measures are effective in avoiding overfishing and maintain an abundance of fish that make fishing economically viable and help promote responsible fishing. Objectives for the BSAI and GOA are set out in the FMPs and include the need to take into account socio-economic considerations.</p> <p>Current Status/Appropriateness/Effectiveness and Evidence Basis:</p> <p>Enforcement reports indicate high compliance in the Pacific cod fisheries (see Clause 10).</p> <p>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 ^{144, 145}.</p> <p>Pacific cod is the second highest species in terms of catch in the BSAI regions. Pacific cod accounted for 13% of the BSAI's groundfish harvest and 75% of the total Pacific cod harvest in Alaska. Retained catch of Pacific cod decreased 1% to 231, 000 t in 2015, and though down from its peak of 241, 000 t in 2012, is 35% higher than the 2006-2010 average. The products made from BSAI Pacific cod had a first-wholesale value of \$362 million in 2015, which was up from \$354 million in 2014 and above the 2006-2010 average of \$300 million. The higher revenue in recent years is largely the result of increased catch and production levels as the average first-wholesale price of Pacific cod products have declined in recent years.</p> <p>Pacific cod typically accounts for just under 30% of the GOA's FMP groundfish harvest and over 20% of the total Pacific cod harvest in Alaska. Retained catch of Pacific cod decreased 4% to 54, 000 t in 2015 (as a result of a mid-year closure of the fishery), and though down from its recent high of 60,000 t in 2011, it is 30% higher than the 2006-2010 average. The products made from GOA Pacific cod had a first-wholesale value was \$103 million in 2015, which was down from \$118 million in 2014 and above the 2006-2010 average of \$190 million. The higher revenue in recent years is largely the result of increased catch and production levels as the average first-wholesale price of Pacific cod products have declined in recent years.</p>			
<p>Conclusion:</p>			

¹⁴⁴ <https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf>

¹⁴⁵ <https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf>

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

<p>References: EBS Pacific cod Economic Status, Appendix to the SAFE report https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf</p> <p>GOA Pacific cod Economic Status, Appendix to the SAFE report https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf</p> <p>AI Pacific cod Economic Status, Appendix to the SAFE report https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf</p>
Non-Conformance Number (if relevant):

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no accounting of interests of fishers including those engaged in subsistence, small-scale and artisanal fisheries.	There is insufficient accounting of interests of fishers including those engaged in subsistence, small-scale and artisanal fisheries.	There is moderate accounting of interests of fishers including those engaged in subsistence, small-scale and artisanal fisheries.	The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries are taken into account.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

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

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

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

Current Status/Appropriateness/Effectiveness:
The GOA and BSAI FMPs describe management measures designed to 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 native consultation.

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

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

EBS Pacific Cod Economic Status, Appendix to the SAFE report
<https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf>

GOA Pacific Cod Economic Status, Appendix to the SAFE report
<https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf>

AI Pacific Cod Economic Status, Appendix to the SAFE report
<https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf>

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

Non-Conformance Number (if relevant):

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

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

Evaluation Parameters

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

Current Status/Appropriateness/Effectiveness: The management measures currently in place have been successful in meeting the management objectives. There is no evidence that the fishery is currently having a significant adverse impact on aquatic habitats or ecosystems, and it is not putting any ETP species at risk of extinction.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws and regulations, fisheries management plans and species status reports.

Evaluation:

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 12.12 below. Measures to preserve the biodiversity of ecosystems (notably Habitat Areas of Particular Concern) are considered under Clause 3.2.5 below and in Clauses 12.9 and 12.13.

Process:

The processes in place address designation of species and development of objectives and measures under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) for species of note - Steller sea lions and northern fur seals; short toed albatross and a number of salmon stocks. Clause 4.2 sets out the basis of the observer programme and the levels of precision available. This forms the basis of data collection directly relevant to the groundfish fisheries under assessment. This programme 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 programme 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 eastern Bering Sea, Aleutian Islands and Gulf of Alaska as appropriate. Marine mammals, and notably Steller sea lions and northern fur seal are monitored according to requirements within the Marine Mammal Protection Act (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 US Fish and Wildlife Service compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process).

Salmon are monitored through assessments carried out by relevant departments of Fish and Game (notably the Alaska Department of Fish and Game). Within the ground fish fisheries, coded-wire tag (CWT) recoveries are used to determine sources of fish taken in bycatches: more recent observer sampling protocols implemented in 2011 are expected to improve estimates of the stock of origin (from both CWT 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 U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.

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

NMFS annually categorizes all U.S. commercial fisheries under the Marine Mammal Protection Act (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 \leq 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 \geq 10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality \geq 50% of PRB. 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 Potential Biological Removals (PBR) for, in particular Steller sea lions and northern fur seal indicates that interaction with the pollock fishery 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 (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated 100,286 square kilometres 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 cod fishery to some extent. The US Fish and Wildlife Service 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 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 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 (Shannon Fitzgerald pers. comm.). 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 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 pollock 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. A number of management actions were implemented by NPFMC to promote the recovery of Steller sea lions, including the restriction of pollock trawling within areas of critical habitat - 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 the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area. Recent surveys indicate that in the GOA pups and non-pups have increased at average rates of from 2-4% and 2-5% per year, giving a sustained increase in population size.

For seabirds, there are no records of Short-tailed albatross having been taken in the GOA Pacific cod fishery. Also as with the BSAI fishery, a recent 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). The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch (monitored through the SEASTATE system) are in place to minimise this bycatch.

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

Evidence Basis:

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NPFMC 2016a; NPFMC 2017; USFWS 2015; Ford 2011

Non-Conformance Number (if relevant):

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no management objectives for avoidance, minimization or mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration"	There are insufficiently clear objectives for avoidance, minimization or mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration"	There are moderately clear objectives for avoidance, minimization or mitigation of impacts on essential fish habitats and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification for the "stock under consideration"	There are management objectives seeking to avoid, minimize or mitigate impacts of the unit of certification on essential habitats for the stock under consideration and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

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

that this clause shall consider Alaska specific designation of important and essential fish habitats categorized as such at the State and federal level.

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

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

Evaluation

This issue is considered more fully under Clauses 12.9 and 12.13. The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to 'prevent, mitigate or minimise, to the extent practicable' any adverse effects of fishing on EFH that are 'more than minimal and not temporary'. Councils are also required to give special attention to Habitat Areas of Particular Concern (HAPC). There is also a requirement for a 5-yearly review of methods to evaluate effects on EFH.

The latest review of Essential Fish Habitat issues has developed a hierarchical impact assessment methodology to operationalise the 'more than minimal and not temporary' criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below 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.

Habitat areas of particular concern (HAPC) are designated following a nomination process according to NPFMC priorities. HAPC nominations are generally on a 5-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.

Process:

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

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

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

NPFMC 2016a; NPFMC 2017; NMFS 2016a; NMFS 2016b; NMFS 2017b

Non-Conformance Number (if relevant):

<p>3.2.6 There shall be management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. FAO ECO (2011) 36.9</p>			
<p>Low Confidence Rating (Critical NC)</p>	<p>Medium Confidence Rating (Major NC)</p>	<p>Medium Confidence Rating (Minor NC)</p>	<p>High Confidence Rating (Full Conformance)</p>
<p>There are no management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.</p> <p>Lacking in all parameters.</p>	<p>There are insufficiently clear management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.</p> <p>Lacking in two parameters.</p>	<p>There are moderately clear management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.</p> <p>Lacking in one parameter.</p>	<p>There are management objectives that seek to minimize adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: There is a process in place by which adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible are identified. This process results in setting relative management objectives. Management priority shall be focused primarily towards minimizing and avoiding impacts.</p> <p>Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, or other regulatory document or laws.</p>			
<p>Evaluation:</p> <p>Effects on ecosystem aspects are considered more fully under Clauses 12.1-12.15. Essentially, there are several processes in place which demonstrably address actual or potential impacts identified through the monitoring of the groundfish fishery and the ecosystem supporting the fishery. The primary mechanism is the annual Stock Assessment and Fishery Evaluation (SAFE) report. Following scientific assessment by the assessment authors, NMFS plan teams, information and recommendations are made to the SSC and NPFMC. 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.</p> <p>There are specific processes through NMFS and U.S. Fish and Wildlife Service (USFWS) to review potential impacts (generally indirect effects through changes in prey availability) on endangered species (through the Endangered Species Act) and marine mammals (Marine Mammal Protection Act). Assessments of the effects of the Alaska groundfish fisheries on many Endangered species are also provided in the Alaska Groundfish Harvest Specifications Environmental Impact Statement. There are also requirements for the relevant agency (NMFS or U.S. Fish and Wildlife Service - USFWS) to evaluate (provide a Biological Opinion) on the effects of the Fishery Management Plans (FMP) for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species. The BiOp process has been</p>			

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 – for example pollock TACs in the EBS were adjusted partially to take account of potential indirect effects on northern fur seal
3. Measures are in place to minimise bycatch and discarding (see Clause 12.5), including specific requirements and management/operational responses relating to prohibited species (notably chinook salmon and halibut – see Clause 12.5 below)
4. Measures have been implemented to minimise direct effects on endangered species and prohibited species (such as salmon escapement devices on pollock trawls) and to minimise indirect effects (such as closure of essential habitat surrounding Steller sea lion rookeries.
5. Measures are in place to protect essential fish habitat (where relevant) and Habitat Areas of Particular Concern (HAPC). Several HAPCs are designated in the GoA, EBS and AI – see Clause 12.9 below.

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

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 Marine Mammal Protection Act, 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 NPFMC consideration of ecosystem indicators, one of which is fur seal pup success. Specific research is also currently underway on factors influencing demography, as outlined in the Northern Fur Seal 2007 Conservation Plan, including studies on habitat-use, physical environmental data, selection of appropriate environmental indices of fur seal success, environmental effects on behaviour and productivity, inclusion of NFS in ecosystem modelling and oceanographic and fishery surveys based on pelagic fur seal habitat use.

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 BiOps. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NMFS 2016a; NMFS 2016b; NMFS 2017a; NMFS 2017b; NPFMC 2016a; NPFMC 2017; Oliver 2017; USFWS 2015; NMFS 2015

Non-Conformance Number (if relevant):

5.2 B. Science and Stock Assessment Activities

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

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

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

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

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

FAO Eco (2009) 29.1-29.3

FAO Eco (2011) 36.1, 36.3, 36.4

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

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

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

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

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

Evaluation (per parameter)/:

Process: There is a satisfactory process to account for fishery removals and mortality of P.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 n. mi.), 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, IPHC and ADFG) system that centrally collates landings data from shore-based processing and landings operations as well as retained catch observations from individual vessels. The CAS system also provides a centralized data platform for the collation of catch (landings and discards) data from the extensive observer program. Catch and effort are recorded through the e-landing (electronic fish tickets) system and also collected by vessel captains in logbooks.

Current Status/Appropriateness/Effectiveness: The data collection and catch estimation methods for P. 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 P. 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 P. 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 organisations with the managed stocks being restricted to the Alaska EEZ.

When fish are landed, a representative of the processor submits the landing report into eLandings and a paper "fish ticket" is printed for both the processor and the vessel representative to sign. Landing reports are mandatory for all processors required to have a Federal processing permit. Landing reports include the fishing start date, the delivery date, gear type, area fished, a breakdown of the weight and condition of each species delivered, and weights of any species that were discarded at the plant before processing. Landings are verified by shore-based observers, and estimates of discards in the P. 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. By-catches in the directed P. cod fisheries are recorded by observers, reported through the CAS, and presented in the annual stock assessments. Sport and subsistence removals are not reported to CAS, but are estimated by ADF&G and are relatively minor for P. 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 P. cod catches is found in the 2016 SAFE documents. Catch reports for P. cod in the BSAI and GOA Regions for 2016 and previous years can be found on the NMFS Alaskan fisheries website¹⁴⁶. ADFG also produces catch documentation on the state-managed P. cod fisheries¹⁴⁷.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Cahalan et al. 2014, NMFS 2017, ADFG 2017, 2016 P. cod SAFE reports

Non-Conformance Number (if relevant):

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

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no availability of timely, complete and	There is insufficient availability of timely,	There is moderate availability of timely,	Timely, complete and reliable statistics are

¹⁴⁶ NMFS catch reports <https://alaskafisheries.noaa.gov/fisheries-catch-landings>

¹⁴⁷ ADFG P. cod harvest data http://www.adfg.alaska.gov/static/applications/web/nocache/fishing/PDFs/commercial/2017_pcod_rockfish_harvest_westward.pdf#2CCC95D020576F5731ADB9FB5F78C88/2017_pcod_rockfish_harvest_westward.pdf

<p>reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is no promotion/use and distribution of this data to ensure a link between applied research and fisheries management.</p> <p>Lacking in all parameters.</p>	<p>complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is insufficient promotion/use and distribution of this data to ensure a link between applied research and fisheries management.</p> <p>Lacking in two parameters.</p>	<p>complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is moderate promotion/use and distribution of this data to ensure a link between applied research and fisheries management.</p> <p>Lacking in one parameter.</p>	<p>compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly and verified through an appropriate system. The use of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage, between applied research and fisheries management (e.g. adoption of scientific advice) is promoted. Results of analysis are distributed accordingly as a contribution to fisheries conservation, management and development.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters

Process: There is a process or system that allows for the production, maintenance, update, and verification of statistical data to international standards. Such standards include the FAO coordinating working party on fishery statistics Handbook of Fishery Statistical Standards. Also, there is a process for the use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g. adoption of scientific advice).

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

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

Evaluation Parameters

Process: For all Alaskan P. 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 is driven by the NPFMC¹⁴⁸ management process. 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 P. cod fisheries in Alaska. Long time series of catch and effort data exist for P. 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 NPFMC websites. The stock assessments involve rigorous peer review that includes scientists from NMFS, ADFG, universities, as well as other organizations. The best and most recent scientific information is reviewed and is used to conduct the assessments and thusly inform the fisheries management process. Results of various research projects, applied studies, research surveys, etc. are reviewed and feed into the stock assessment process and management of the Alaskan P. cod fisheries. Management is clearly is based on the scientific advice, without exception.

Evidence Basis: Data on catches of Alaskan P. cod are maintained and updated by NMFS and are available on their website¹⁴⁹. The SAFE documents^{150,151,152}, for the 3 federal-waters P. 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 (AKFIN) was established in 1997 and maintains an analytic database of both state and federal commercial fisheries data in Alaska¹⁵³ relevant to the needs of fisheries scientists and other users, and provides that data in usable formats.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC 2017, NMFS 2017, Thompson 2016, Barbeaux et al. 2016, Thompson and Palsson 2016, AKFIN

Non-Conformance Number (if relevant):

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

FAO Eco (2009) 30.4

FAO ECO (2011) 37.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
If appropriate, there is no use of generic evidence based on similar stocks for fisheries with low risk to that "stock under consideration".	If appropriate, there is insufficient availability or use of generic evidence based on similar stocks for fisheries with low risk to that	If appropriate, there is moderate availability or use of generic evidence based on similar stocks for fisheries with low risk to that "stock under	In the absence of specific information on the "stock under consideration", generic evidence based on similar stocks can be used for fisheries with

¹⁴⁸ NPFMC FMPs <http://www.npfmc.org/fishery-management-plans/>

¹⁴⁹ NMFS catch reports <https://alaskafisheries.noaa.gov/fisheries-catch-landings>

¹⁵⁰ EBS P. cod SAFE 2016 <https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpcod.pdf>

¹⁵¹ GOA P. cod SAFE 2016 <https://www.afsc.noaa.gov/REFM/Docs/2016/GOApcod.pdf>

¹⁵² AI P. cod SAFE 2016 <https://www.afsc.noaa.gov/REFM/Docs/2016/aipcod.pdf>

¹⁵³ AKFIN <http://www.akfin.org/about-akfin>

Lacking in all parameters.	"stock under consideration", taking into account that the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. Lacking in two parameters.	consideration", taking into account that the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. Lacking in one parameter.	low risk to that "stock under consideration". However, the greater the risk of overfishing, the more specific evidence is necessary to ascertain the sustainability of intensive fisheries. Fulfils all parameters.
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Evaluation Parameters

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

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

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

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

Evaluation (per parameter)/: As per Note in the Evaluation Parameters section in this clause, this clause is scored with Full Conformance, as the Alaskan P. cod assessments are conducted on a stock-specific basis. The three SAFE reports explicitly state that P. 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 organisations with the managed stocks being restricted to the Alaska EEZ.

Conclusion: NA

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: 2016 P. Cod SAFE reports

Non-Conformance Number (if relevant):

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

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No observer scheme designed to collect accurate data for research and to support compliance.	Observer scheme established but there is insufficient collection of accurate	Observer scheme established but there is moderate collection of accurate data for research and	An observer scheme designed to collect accurate data for research and support compliance with

Lacking in all parameters.	data for research and to support compliance. Lacking in two parameters.	to support compliance. Lacking in one parameter.	applicable fishery management measures is established. Fulfils all parameters.
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Evaluation Parameters

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

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

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

Evaluation (per parameter)/:

Process: Beginning in 2013, Amendment 86 to the FMP of the BSAI and Amendment 76 to the FMP of the GOA established the new North Pacific Groundfish and Halibut Observer Program (NPGHOP)¹⁵⁴. 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 P. 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 NPGHOP cover all biological information from commercial fisheries, including catch weights (landings and discards), catch demographics (species composition, length, sex and age) and interactions with species such as sharks, rays, seabirds, marine mammals and other species with limited or no commercial value. For halibut, viability (injury and condition) data are collected by observers to generate halibut discard mortality rates (DMR) in Alaskan groundfish fisheries.

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

Evidence Basis: Detailed annual reports from the Observer Program can be found on AFSC and NMFS websites¹⁵⁵. 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 2016 Observer Sampling Manual, over 400 certified groundfish observers are deployed each year on a variety of commercial fishing vessels for numerous Alaskan fisheries, including P. cod, providing the Observer Program with over 37,000 data collection days annually¹⁵⁶. Information on calculation of DMRs for Alaskan fisheries can be found in the DMR WG report¹⁵⁷. Faunce et al. (2016) contains an analysis of observer

¹⁵⁴ NMFS 2015 https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf

¹⁵⁵ Observer report for 2016. <https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf>

¹⁵⁶ Observer manual https://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2016.pdf

¹⁵⁷ DMR WG Report <http://npgmc.legistar.com/gateway.aspx?M=F&ID=34847078-2ed2-4d3c-85a5-73e26235c1d5.pdf>

deployment in Alaskan fisheries in 2015¹⁵⁸. NMFS and the NPFMC have developed an Electronic Monitoring (EM) Strategic Plan to integrate video monitoring into the Observer Program to improve data collection¹⁵⁹.

The following text is from the 2016 Observer Report (NMFS 2017). "Recognizing the challenging logistics of putting observers on small vessels, NMFS continues to recommend that vessels less than 40 ft. be in the no selection pool for observer coverage. However, since there is no monitoring data from this segment of the fleet NMFS also supports the Council's recommendation to develop a discussion paper about incorporating vessels less than 40 ft LOA in the EM selection pool." For P. cod fisheries, an analysis of the catch data showed that the amount of P. cod taken by vessels < 40 ft. LOA was less than 1% of the total catch in 2013-2015. Other information on observer coverage of P. cod fisheries in GOA and BSAI was presented in Sections 3.1 and 3.6.5 above.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC 2016, 2017; AFSC 2016, 2017; Faunce et al. 2016

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.4.6/7.4.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no compilation and distribution of data in accordance with confidentiality requirements.	There is insufficient compilation and distribution of data in accordance with confidentiality requirements.	There is moderate compilation and distribution of data in accordance with confidentiality requirements.	Sub-regional or regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

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

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

¹⁵⁸ Faunce et al. 2016. Observer deployment report for 2015 <https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-322.pdf>

¹⁵⁹ NPFMC EM https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/Final2017EMPre-impPlan.pdf



<p>Current Status/Appropriateness/Effectiveness: There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports where confidentiality requirements have been effected.</p>			
<p>Evaluation (per parameter)/: Process: There are systems within NMFS, NPFMC, and ADFG management structures that allow for complete data distribution in line with confidentiality requirements.</p> <p>Current Status/Appropriateness/Effectiveness: NMFS and ADFG have extensive scientific databases which include P. cod, and NPFMC has substantial information on management of P. cod in Alaskan waters. These data are made widely available through the agency websites, publications and at various publically-attended meetings. Data on certain aspects of commercial fishing are considered to be confidential, such as analysis and reporting of fishery data, depending on the number of individuals or entities involved.</p> <p>Evidence Basis: NPFMC management plans, and SAFE documents contained detailed data which is widely disseminated, and confidentiality is maintained as necessary. The Commercial Fisheries Entry Commission¹⁶⁰ 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.</p>			
<p>Conclusion:</p>			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
<p>References: CFEC 2017</p>			
<p>Non-Conformance Number (if relevant):</p>			

<p>4.4 States shall stimulate the research required to support national policies related to fish as food.</p>			
<p>FAO CCRF 12.7</p>			
<p>Low Confidence Rating (Critical NC)</p> <p>There is no stimulation of research required to support national policies related to fish as food.</p> <p>Lacking in all parameters.</p>	<p>Medium Confidence Rating (Major NC)</p> <p>There is insufficient stimulation of research required to support national policies related to fish as food.</p> <p>Lacking in two parameters.</p>	<p>Medium Confidence Rating (Minor NC)</p> <p>There is moderate stimulation of research required to support national policies related to fish as food.</p> <p>Lacking in one parameter.</p>	<p>High Confidence Rating (Full Conformance)</p> <p>The State stimulates the research required to support national policies related to fish as food.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters Process: There is research to support national policies related to fish as food. Current Status/Appropriateness/Effectiveness: There is evidence of this research. Evidence Basis: Availability, quality, and adequacy of the evidence.</p>			
<p>Evaluation (per parameter)/:</p>			

¹⁶⁰ CFEC website <https://www.cfec.state.ak.us/>

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

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

Evidence Basis: ASMI¹⁶¹ is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training and sustainability certification. ASMI's role includes conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state.

Through the University of Alaska Fairbanks, the state of Alaska also operates the Kodiak Seafood and Marine Science Center (KSMSC)¹⁶², which directs efforts in several fields, including seafood processing technology, and seafood quality and safety. KSMSC staff work closely with the fishing industry to convey research results and provide educational opportunities that help seafood workers improve efficiency and the quality of their products.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: ASMI 2017, UAF 2017

Non-Conformance Number (if relevant):

4.5 States shall ensure that a sufficient knowledge of the economic, social, marketing and institutional aspects of fisheries is collected through data gathering, analysis and research and that comparable data are generated for ongoing monitoring, analysis and policy formulation.

FAO CCRF (1995) 7.4.5, 12.9

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation.	There is insufficient assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation.	There is moderate assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation.	The state ensures that the economic, social, marketing and institutional aspects of fisheries are adequately researched and that comparable data are generated for ongoing monitoring, analysis and policy formulation.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is a system in place by which knowledge of the economic, social, marketing and institutional aspects of fisheries is collected.

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on social/cultural/economic value of the resource.

¹⁶¹ ASMI <http://www.alaskaseafood.org>

¹⁶² UAF Kodiak Center <https://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/>

Evaluation (per parameter)			
Process: Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the Magnuson-Stevens Act (MSFCMA or MSA ¹⁶³), the NEPA, the Endangered Species Act, and other applicable laws. AFSC/NMFS Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska.			
Current Status/Appropriateness/Effectiveness: The economic and socio-economic data collected for the P. cod fisheries are extensive, and data are used for ongoing analysis. These analyses include estimates of total P. cod and groundfish catch, discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the fisheries off Alaska, and employment on at-sea processors. Annual reports contain a wide range of analyses and information on the performance of numerous indices for different sectors of the North Pacific fisheries, including P. 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 ¹⁶⁴ on social/cultural/economic value of the Alaskan fisheries resources are produced, which include extensive information on the Alaskan P. cod fisheries. A report prepared by the McDowell Group in 2015 for ASMI quantifies the regional, state-wide, and national economic impacts of Alaska's seafood industry. This report ¹⁶⁵ summarizes overall industry impacts, participation, value, and exports. BSAI and GOA P. cod assessment SAFE reports have extensive sections on the economic performance of the P. cod fisheries, and these are summarized in Section 3.3 in the Information Sources section above. Amendment 80 cooperatives file annual reports with NPFMC outlining fleet performance and other metrics.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References: NMFS 1996, Fissel et al 2016, The McDowell Group 2015.			
Non-Conformance Number (if relevant):			

4.6 States shall investigate and document traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development.			
FAO CCRF 12.12			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no investigation and documentation traditional fisheries technology applied to small scale fisheries.	There is insufficient investigation and documentation traditional fisheries technology applied to small scale fisheries.	There is moderate investigation and documentation traditional fisheries technology applied to small scale fisheries.	The State investigates and documents traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation,

¹⁶³ NMFS 1996 MSFCMA <http://www.nmfs.noaa.gov/sfa/maqact/>

¹⁶⁴ Fissel et al. 2016. <http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf>

¹⁶⁵ The McDowell Group report http://ebooks.alaskaseafood.org/ASMI_Seafood_Impacts_Dec2015/#/0/

Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	management and development. Fulfils all parameters.
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Evaluation Parameters

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

Current Status/Appropriateness/Effectiveness: There are records of the documentation of small scale fisher practices.

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

Evaluation (per parameter)/:

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

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

Evidence Basis: All data from the state and federally managed P. cod fisheries are included in the stock assessments. Relative to commercial catch, there is minimal recreational, personal use, or subsistence fishing for P. cod in Alaskan waters, and all estimates of such catches compiled by ADFG are included in the assessment catch data. Smaller scale fisheries managed by ADFG and BOF are controlled with specified Guideline Harvest Level (GHL) and other regulations, such as closed areas around Steller sea lion rookeries¹⁶⁶.

The NPFMC established a Rural Outreach Committee in 2009 to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. Further details on this are contained in Clauses 2.2 and 8.3.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: ADFG 2015, NPFMC 2017

Non-Conformance Number (if relevant):

Not applicable

4.7 States conducting scientific research activities in waters under the jurisdiction of another State shall ensure that their vessels comply with the laws and regulations of that State and international law.

FAO CCRF 12.14

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Research vessels do not comply with the	Research vessels insufficiently comply	Research vessels moderately comply	The state conducting scientific research

¹⁶⁶ ADFG Commercial Fisheries news release <https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/634206707.pdf>

laws and regulations of that State and international law.	with the laws and regulations of that State and international law.	with the laws and regulations of that State and international law.	activities in waters under the jurisdiction of another State ensures that their vessels comply with the laws and regulations of that State and international law.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.
Evaluation Parameters Note: If the stock is fully managed by one state and there is no need for shared stock research (between two or more jurisdictions), then this clause is not applicable. Process: There is a system in place to manage the conduct of research vessels operating in waters under the jurisdiction of other states Current Status/Appropriateness/Effectiveness: If so, there is record of such shared research activities and they comply with required regulations. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports.			
Evaluation (per parameter)/: The stock is fully managed by the USA, and the fishery occurs in the US EEZ. Thus there is no need for shared stock research with other jurisdictions and this clause is not applicable.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

Not applicable 4.8 States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and shall, where appropriate, support the establishment of mechanisms, including, inter alia, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and shall encourage the sharing of such research results with other regions. <p style="text-align: right;">FAO CCRF 12.15, 12.16</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Does not promote adoption of uniform guidelines governing high seas research or sharing of data between regions or sub-regions.	Insufficiently promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions.	Moderately promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions.	States promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and, where appropriate, support the establishment of mechanisms, including, <i>inter alia</i> , the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and encourage the sharing of such research

Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	results with other regions. Fulfils all parameters.
<p>Evaluation Parameters If the stock is fully managed by one state and there is no need for shared stock research (between two or more jurisdictions), then this clause is not applicable. Process: There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas. Current Status/Appropriateness/Effectiveness: There is a record of uniform high seas research guidelines or a mechanism to create them. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports, high seas guidelines.</p>			
<p>Evaluation (per parameter)/: The stock is fully managed by the USA, and the fishery occurs in the US EEZ. Thus there is no need for shared stock research with other jurisdictions and this clause is not applicable.</p>			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

<p>Not applicable</p> <p>4.9 States and relevant international organizations shall promote and enhance the research capacities of developing countries, <i>inter alia</i>, 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.</p> <p style="text-align: right;">FAO CCRF 12.18</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Does not enhance research capacity of developing countries. Lacking in all parameters.	Insufficiently enhance research capacity of developing countries. Lacking in two parameters.	Moderately enhance research capacity of developing countries. Lacking in one parameter.	States and relevant international organizations promote and enhance the research capacities of developing countries, <i>inter alia</i> , in the areas of data collection and analysis, information, science and technology, human resource development and provision of research facilities, in order for them to participate effectively in the conservation, management and

			sustainable use of living aquatic resources. Fulfils all parameters.
Evaluation Parameters Note: This clause is only applicable when the Unit of Certification includes a transboundary stock which is fished by one or more developing countries. Process: There is a mechanism in place by which the research capacities of developing countries can be developed and enhanced. This could include, but is not limited to, the provision of personnel, equipment, or funding, or cooperation on data collection and stock assessment. Current Status/Appropriateness/Effectiveness: There are recognizable examples of instances in the history of the fishery under assessment where actions by the managers of the Unit of Certification have promoted or enhanced the research capacity of one or more developing nations in the ways described above. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.			
Evaluation (per parameter)/: The stock is fully managed by the USA, and the fishery occurs in the US EEZ. There are no developing countries involved in this fishery, and thus this clause is not applicable.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

Not applicable			
4.10 Competent national organizations shall, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. FAO CCRF 12.19			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Does not render technical and financial support. Lacking in all parameters.	Insufficiently render technical and financial support. Lacking in two parameters.	Moderately render technical and financial support. Lacking in one parameter.	Competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. Fulfils all parameters.
Evaluation Parameters			

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

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

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

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

Evaluation (per parameter)/: This fishery meets the FAO definition of a developed fishery, and thus this clause is not applicable.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>

References:

Non-Conformance Number (if relevant):

Not applicable

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

FAO CCRF 12.20

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Competent national organizations, where appropriate, do not render technical and financial support towards research effort.	Competent national organizations, where appropriate, insufficiently render technical and financial support towards research effort.	Competent national organizations, where appropriate, moderately render technical and financial support towards research effort.	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.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

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

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

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

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.				
Evaluation (per parameter)/: This fishery does not include a developing or small island region and thus this clause is not applicable.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

5. There shall be regular stock assessment activities appropriate for the fishery, its range, the species biology and the ecosystem, undertaken in accordance with acknowledged scientific standards to support its optimum utilization.
FAO CCRF (1995) 7.2.1/12.2/12.3/12.5/12.6/12.7/12.17
FAO Eco (2009) 29-29.3, 31
FAO Eco (2011) 42

5.1 An appropriate institutional framework shall be established to determine the applied research which is required and its proper use (i.e. assess/evaluate stock assessment model/practices) for fishery management purposes.
FAO CCRF 12.2, 12.6

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Establishment of appropriate institutional framework for applied research does not exist. Lacking in all parameters.	The appropriate institutional framework is established to determine the applied research required, but there is insufficient use for fishery management purposes. Lacking in two parameters.	The appropriate institutional framework is established to determine the applied research required, but there is moderate use for fishery management purposes. Lacking in one parameter.	An appropriate institutional framework is established to determine the applied research required, and its proper use (i.e., assess and evaluate stock assessment models or practices) for fishery management purposes. Fulfils all parameters.

Evaluation Parameters
Process: There is an established institutional framework for fishery management purposes that determines applied research needs and use.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that essential research for fishery management purposes is determined and carried out. This research generally includes routine stock(s) and ecosystem assessment reports.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include description of the overall process of research assessment and peer review, stock and ecosystem assessment reports.

Evaluation (per parameter)/:
Process: Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the Alaska Fisheries Science Center (AFSC) in

Seattle, which operates several laboratories and Divisions. The Auke Bay Laboratories in Alaska conduct scientific research on fish stocks, fish habitats, and the chemistry of marine environments. The Fisheries Monitoring and Analysis Division (FMA) monitors groundfish fishing activities in the US EEZ off Alaska and conducts research associated with sampling commercial fishery catches, estimation of catch and bycatch mortality, and analysis of fishery-dependent data. The Resource Assessment and Engineering Division (RACE) conducts fishery surveys to measure the distribution and abundance of approximately 40 commercially important fish and crab stocks. The Resource Ecology and Fisheries Management Division (REFM) collects data to support management of Northeast Pacific and eastern Bering Sea fish and crab resources, including P. cod. REFM also produces an annual Economic Status Report. ADFG has a well-developed research capacity and conducts surveys and stock assessments in State waters to help determine safe harvest levels. NPFMC actively encourages stakeholder participation, and all Council deliberations are conducted in open, public sessions.

Current Status/Appropriateness/Effectiveness: Peer reviewed stock assessments are done annually and used as the scientific basis to set catch quotas for the 3 P. 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 maximum sustainable yield of the groundfish complex as well as its component species groups, assessments on the stock condition of individual species groups; assessments of the impacts on the ecosystem of harvesting the groundfish complex at the current levels given the assessed condition of stocks, including consideration of rebuilding depressed stocks; and alternative harvest strategies and related effects on the component species groups. Various biological studies and surveys which feed data into the stock assessments are reviewed as well. The SAFE reports are scientifically based, consider all available research on P. cod including that which is conducted in state waters and provide information to NPFMC for determining annual harvest specifications, documenting significant trends or changes in the stocks, marine ecosystem, and fisheries. The SAFE reports are comprehensive and publically available. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by the Center of Independent Experts (CIE), and any recommendations are addressed in subsequent stock assessments.

Evidence Basis: The NMFS/AFSC website has detailed information on Alaskan P. cod research and stock assessment¹⁶⁷. The SAFE reports (see Section 4 above for details and references to the three P. cod SAFE documents for 2016) are compiled annually by the BSAI and GOA Groundfish Plan Teams, which are appointed by the NPFMC. As outlined in the current NPFMC Groundfish FMPs^{168,169} for BSAI and GOA, scientists from the AFSC, ADFG, other agencies, and universities prepare a Stock Assessment and Fishery Evaluation (SAFE) report annually. The SAFE report consists of three volumes: a volume containing stock assessments, one containing economic analysis, and one describing ecosystem considerations. Chapters of the assessment volume deal with each stock assessment (e.g. for each P. cod stock assessment). This document is reviewed first by the NPFMC Groundfish Plan Team, then by the Scientific and Statistical Committee (SSC) and Advisory Panel, and finally by the full Council. The review by the SSC¹⁷⁰ constitutes the official scientific review for purposes of the Information Quality Act. Upon review and acceptance by the SSC, the SAFE report and any associated SSC comments constitute the best scientific information available for purposes of the Magnuson-Stevens Act. The EBS P. cod assessment was reviewed by three external reviewers from the CIE during February, 2016, and their reports are available on the NMFS website¹⁷¹. Recommendations from these reviews were taken into account in the 2016 EBS cod assessment, where possible.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

¹⁶⁷ NMFS P. cod information https://www.afsc.noaa.gov/species/Pacific_cod.php#

¹⁶⁸ NPFMC GOA FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmfp.pdf>

¹⁶⁹ NPFMC BSAI FMP <https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>

¹⁷⁰ NPFMC SSC Report <http://npfmc.legistar.com/gateway.aspx?M=F&ID=2705c3ce-ed5a-4ab3-9936-4cf70912ee1c.pdf>

¹⁷¹ CIE Reviews <https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2016>

References: NMFS 2017, NPFMC 2016, 2017.

Non-Conformance Number (if relevant):

5.1.1 With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries resulting in greater uncertainty about the state of the stock under consideration, more precautionary approaches to managing fisheries on such resources shall be required, including where appropriate, lower level of utilization of resources. A record of good management performance may be considered as supporting evidence of the adequacy and the management system.

FAO Eco (2011) 42

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are not required, including where appropriate, lower level of utilization of resources. Lacking in all parameters.	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are insufficiently required, including where appropriate, lower level of utilization of resources. Lacking in two parameters.	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are moderately required, including where appropriate, lower level of utilization of resources. Lacking in one parameter.	With the use of less elaborate methods for stock assessment frequently used for small scale or low value capture fisheries, more precautionary approaches to managing fisheries on such resources are required, including where appropriate, lower level of utilization of resources. Fulfils all parameters.

Evaluation Parameters

Note: if the fishery for the stock under consideration has sufficient data collected through regular stock assessment activities for its management then this clause can be scored with full conformance.

Process: There is a process that allows for the application of more precautionary approaches to managing fisheries (e.g. lower exploitation rates) on resources assessed through stock assessment methods resulting in greater uncertainty about the state of the stock under consideration.

Current Status/Appropriateness/Effectiveness: There is evidence for the application of precautionary approaches to managing fisheries (e.g. lower exploitation rates) on resources assessed through stock assessment methods resulting in in greater uncertainty about the state of the stock under consideration.

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

Evaluation (per parameter)/: Based on the Note under Evaluation Parameters in this section, the fisheries under consideration have sufficient data, and this clause can be scored with full conformance.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: CIE 2016.

Non-Conformance Number (if relevant):

5.1.2 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. Results of analyses shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

FAO CCRF (1995) 12.1/7.4.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>The state does not conduct and make available appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and institution building to conduct the research.</p> <p>Lacking in all parameters.</p>	<p>The state conducts and makes available insufficiently appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and institution building to conduct the research.</p> <p>Lacking in two parameters.</p>	<p>The state conducts and makes available moderately appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and institution building to conduct the research.</p> <p>Lacking in one parameter.</p>	<p>States ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. The research is disseminated accordingly. States also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There are organizations and processes in place to permit research into all aspects of fisheries, as listed in the clause.

Current Status/Appropriateness/Effectiveness: Research is carried out in fisheries biology, fisheries ecology, fisheries technology, environmental science, fisheries economics, social science, aquaculture, nutritional science. In fisheries where there is no demonstrable nutritional science being conducted, but all other types of research are carried out, the fishery shall be deemed compliant with this evaluation parameter.

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

Evaluation (per parameter)/:

Process: Appropriate research is conducted into all aspects of P. 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. A number of 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 P. 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 P. cod abundance. NMFS research plans, data gaps, and priorities are listed in the annual P. 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 is available to the public in readily understandable fashion. Thus the best scientific evidence is made readily available as a contribution to fisheries conservation and management. Research facilities and appropriate training are provided at a number of locations in Alaska.

Evidence Basis: Extensive research, survey, and stock assessment results are described in the three P. cod SAFE documents from 2016 (referenced in Clause 4.1.1 above). Numerous other documents are published in a variety of sources each year, containing biological and ecological studies on P. cod, details of stock assessment, and survey methodology and results. The three SAFE reports explicitly state that P. 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. 2016 reference in Section 4.6 above) provides estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, values of catch and resulting food products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, and employment on at-sea processors. The report contains a wide range of analyses and comments on the performance of a range of indices for different sectors of the North Pacific fisheries, and relates changes in value, price, and quantity, across species, product and gear types, to changes in the market. This report includes a considerable amount of economic data for the commercial P. cod fisheries¹⁷², and a summary appears in each P. cod stock assessment SAFE in 2016.

The Bering Sea Project, a partnership between the The North Pacific Research Board (NPRB) and the National Science Foundation, is studying the Bering Sea ecosystem from atmospheric forcing and physical oceanography to humans and communities, as well as socio-economic impacts of a changing marine ecosystem. Scientists and researchers from a number of agencies and universities are involved. Ecosystem modelling, sound data management, and education and outreach activities are included in the program¹⁷³. An integrated GOA Ecosystem project, also funded by the NPRB, is examining recruitment processes of major groundfish species.

The University of Alaska¹⁷⁴ provides bachelor, masters and doctoral programs in fisheries science, associate degrees and certificates in fisheries technology. University faculty supervise graduate student research on a broad array of biological topics including quantitative stock assessment, biology and ecology of marine and freshwater species, molecular genetics, and behavioural ecology. Facilities are located in Juneau, Seward, Kodiak and Fairbanks. The University of Alaska Fairbanks Kodiak Seafood and Marine Science Center¹⁷⁵ promotes the sustainable use of Alaska fisheries through collaborative research, application, education and information transfer. The areas of focus include seafood safety and quality, product markets and development, and bycatch reduction and environmental concerns.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: 2016 P. Cod SAFE reports, Fissel et al. 2016, NPRB 2017, UAF 2017.

Non-Conformance Number (if relevant):

¹⁷² Fissel et al 2016 Economic SAFE <https://www.afsc.noaa.gov/refm/docs/2016/economic.pdf>

¹⁷³ NPRB http://www.nprb.org/assets/images/uploads/01.10_bsaq_web.pdf.

¹⁷⁴ UAF <https://www.uaf.edu/sfos/research/fisheries/>

¹⁷⁵ UAF Kodiak Center <http://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/>

5.2 There shall be established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.

FAO CCRF (1995) 12.5
FAO Eco (2009) 31

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.</p> <p>Lacking in all parameters.</p>	<p>There is an insufficiently established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.</p> <p>Lacking in two parameters.</p>	<p>There is a moderately established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.</p> <p>Lacking in one parameter.</p>	<p>There is established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters
Process: There is a system that establishes the required research capacity needed to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.
Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that there is sufficient research capacity in place for assessing and monitoring the state of the stock under consideration, impacts of fishing pressure, pollution and habitat alteration and the effects of climate or environment change on fish stocks and aquatic.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock, ecosystem and habitat assessment reports.

Evaluation (per parameter)/:
Process: The NMFM, ADFG, and University of Alaska maintain established research programs to monitor the state of the P. cod stocks and effects of fishing, pollution, habitat alteration and climate change.
Current Status/Appropriateness/Effectiveness: : NPFMC receives comprehensive presentations on the status of Alaska’s marine ecosystems (Gulf of Alaska and Bering Sea) at its SSC and Advisory Panel meetings, as part of its annual management process for Alaskan groundfish. These are prepared and presented by NMFS scientists, and contain report cards which look at a wide range of environmental and ecosystem variables, such as physical and environmental trends, zooplankton biomass, predator and forage species biomass, and seabird and marine mammal data. Essential fish habitat is identified for managed fish species, including P. cod.
 The Oil Spill Recovery Institute (OSRI) was established by US Congress in response to the 1989 Exxon Valdez oil spill. OSRI is administered through and housed at the Prince William Sound Science Center, a non-profit research and education organization located in Cordova, AK. The PWS Science Center facilitates and encourages ecosystem studies in the Greater Prince William Sound region. The Congressional mandate given OSRI is:

1. To identify and develop the best available techniques, equipment and materials for dealing with oil spills in the Arctic and sub-Arctic marine environment; and,
2. To complement federal and state damage assessment efforts and determine, document, assess and understand the long-range effects of Arctic and sub-Arctic oil spills on the natural resources of Prince William Sound, and the environment, the economy and the lifestyle and well-being of the people who are dependent on those resources.

Evidence Basis: Alaska’s P. cod stock assessment programs (NMFS, ADFG) are extensive and comprehensive, and documented in the annual SAFE process (see references in Clause 4.1.1. above). They contain regular updates of stock status, including how each stock is positioned relative to precautionary approach reference points. Ecosystem considerations are presented in each SAFE assessment report. In addition, comprehensive Ecosystem Reports for EBS, AI, and GOA are presented to NPFMC annually (e.g. Zador (ed). 2016a, b, c for 2016 reports), which look at numerous elements of the Alaskan Ecosystems (see Clause 5.2 for more details). Each SAFE document for P. cod has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem.

The North Pacific Research Board (NPRB) has developed two special projects that seek to understand the integrated ecosystems of the BSAI and GOA. For example, in the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the \$17.6 million GOA ecosystem study that looks at the physical and biological mechanisms that determine the survival of juvenile groundfish in the eastern and western Gulf of Alaska¹⁷⁶. There is also an NPRB study on modeling growth and survival of early life-stages of Pacific cod in response to climate-related changes in sea ice conditions in the Bering Sea¹⁷⁷.

NMFS identifies habitats essential for managed species and conserves habitats from adverse effects on those habitats. These habitats are termed “Essential Fish Habitat” or EFH, and are defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity”. NMFS and NPFMC must describe and identify EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH¹⁷⁸.

OSRI produces an annual report¹⁷⁹, among other publications. The 2016 report contains details on their activities, including ongoing research projects, an update of field guide for oil spill response in arctic waters, and shore-zone mapping of the eastern Aleutian Islands.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: NPRB 2017, NPFMC 2017, OSRI 2017, Zador (ed.) 2016a, b, c

Non-Conformance Number (if relevant):

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

FAO 12.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
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¹⁷⁶ NPRB GOA project <http://www.nprb.org/gulf-of-alaska-project/preliminary-final-results/>

¹⁷⁷ NPRB Fish and Invertebrate projects http://www.nprb.org/assets/uploads/files/General_NPRB/overview_fish_inverts.pdf

¹⁷⁸ NPFMC EFH <http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/>

¹⁷⁹ OSRI Annual Report 2016 <http://www.pws-osri.org/wp-content/uploads/2013/05/FY16-Annual-report.pdf>

<p>There is no cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.</p> <p>Lacking in two parameters.</p>	<p>There is moderate cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.</p> <p>Lacking in one parameter.</p>	<p>Management organizations cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: There is cooperation or interaction between international organizations to ensure optimum utilization of resource.</p> <p>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.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.</p>			
<p>Evaluation (per parameter)/:</p> <p>Process: USA cooperates through relevant international organizations such as PISCES to encourage research in order to ensure optimum utilization of all fishery resources. Although the fishery for P. cod is conducted entirely within the US EEZ, there is also scientific cooperation with neighboring countries such as Canada who fish for P. cod from adjacent stocks.</p> <p>Current Status/Appropriateness/Effectiveness: The North Pacific Marine Science Organization (PISCES) is an intergovernmental scientific organization, was established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas. Its present members are Canada, Japan, People's Republic of China, Republic of Korea, the Russian Federation, and the United States of America. Its scientific program named FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is an integrative program undertaken by the member nations and affiliates of PICES to understand how marine ecosystems in the North Pacific respond to climate change and human activities.</p> <p>The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off the West Coast. Representatives from Canadian and American state and federal agencies continue to meet annually to exchange information and to identify data gaps and information needs for groundfish stocks of mutual concern from California to Alaska. Not all of these are transboundary stocks (e.g. P. halibut is, P. cod is not). Each agency prepares a comprehensive annual report highlighting survey and research activities, including stock assessments. These reports are compiled into an annual TSC report that is published online. The TSC reviews agency reports and recommends collaborative work or plans workshops on topics of shared interest, such as survey methodology, tagging programs, electronic data capture, and fish ageing.</p> <p>Evidence Basis: The PISCES website can be found here¹⁸⁰, and the TSC website can be found here¹⁸¹, and includes minutes of meetings through 2016, as well as workshop reports. NMFS scientists from Alaska (e.g. Auke Bay Laboratories) maintain collaborative ties with researchers from many international agencies and institutions¹⁸².</p>			
<p>Conclusion:</p>			
<p>Evidence Rating:</p>	<p>Low <input type="checkbox"/></p>	<p>Medium <input type="checkbox"/></p>	<p>High <input checked="" type="checkbox"/></p>

¹⁸⁰ <http://meetings.pices.int/members/scientific-programs>

¹⁸¹ Canada-USA Technical Subcommittee <http://www.psmfc.org/tsc2>

¹⁸² NMFS International cooperation <https://www.afsc.noaa.gov/ABL/InteragencyCooperation.htm>

Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: TSC 2017, PISCES 2017, NMFS 2017.				
Non-Conformance Number (if relevant):				

NOT APPLICABLE

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

FAO CCRF 12.7, 12.17

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no development of collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks.	There is insufficient development collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks.	There is moderate development of collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks.	The fishery management organizations directly, or in conjunction with other States, develop collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters
 Not applicable if stock in not transboundary in nature.
Process: The collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks have been developed.
Current Status/Appropriateness/Effectiveness: There is evidence available to substantiate that such cooperation or interaction has taken place. There are data on such collaborations for transboundary aquatic stock understanding.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)/:
 Not applicable as the P. cod stocks are not transboundary in nature.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

Non-Conformance Number (if relevant):

5.5 Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no analysis of research data, or publication of that data in a way that ensures confidentiality, where appropriate.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient analysis of research data or publication of that data in a way that ensures confidentiality, where appropriate.</p> <p>Lacking in two parameters.</p>	<p>There is moderate analysis of research data, or publication of that data in a way that ensures confidentiality, where appropriate.</p> <p>Lacking in one parameter.</p>	<p>Data generated by research is analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.</p> <p>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.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.</p>			
<p>Evaluation (per parameter)/:</p> <p>Process: There is a well-defined public process, coordinated by NPFMC, NFMS, and ADFG that allows extensive analysis of research and relevant commercial fisheries data, ensuring their confidentiality when necessary.</p> <p>Current Status/Appropriateness/Effectiveness: As documented in some previous clauses, extensive scientific data from various sources are analysed and presented in peer reviewed meetings and/or in primary literature, following scientific protocols. Results of these analyses are disseminated in a timely fashion through numerous methods, including scientific publications, and as information on websites of various agencies, in order to contribute to P. cod fisheries conservation and management. Confidentiality is required by Alaska statute and data is redacted in reports when necessary.</p> <p>Evidence Basis: The P. 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 NPFMC 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 (see Thompson 2016 EBS P. cod SAFE for examples). 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.</p>			
<p>Conclusion:</p>			
<p>Evidence Rating:</p>	<p>Low <input type="checkbox"/></p>	<p>Medium <input type="checkbox"/></p>	<p>High <input checked="" type="checkbox"/></p>
<p>Non-Conformance:</p>	<p>Critical <input type="checkbox"/></p>	<p>Major <input type="checkbox"/></p>	<p>Minor <input type="checkbox"/> None <input checked="" type="checkbox"/></p>
<p>References: Thompson 2016</p>			
<p>Non-Conformance Number (if relevant):</p>			

5.3 C. The Precautionary Approach

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

FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2-29.2bis, 29.6, 30-30.2
FAO Eco (2011) 36.2, 36.3, 37, 37.1, 37.2

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No safe target reference points have been established. Lacking in all parameters.	Target reference points have been established but considered insufficiently safe. Lacking in two parameters.	Target reference points have been established but considered moderately safe. Lacking in one parameter.	Target reference points have been established and are consistent with achieving MSY. Fulfils all parameters.

Evaluation Parameters

Process: A target reference point(s) or proxy has been officially established. Managers shall be able to apply technical measures to reduce fishing pressure in the event that reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness: The official target reference point or proxy is consistent with achieving maximum sustainable yield (MSY) or a suitable proxy, and there is evidence that it has been used as an objective by the management process. If there are historical instances of the reference point being approached or exceeded, managers have taken remedial action as appropriate. In the context of reference points, when data are insufficient to estimate reference points directly other measures of productive capacity can serve as reasonable substitutes or "proxies". Suitable proxies may be, for example, standardized cpue as a proxy for biomass or specific levels of fishing mortality and biomass which have proven useful in other fisheries and can be used with a reasonable degree of confidence in the absence of better defined levels. It is important to note that the use of a proxy may involve additional uncertainty, and if so, should trigger the use of extra precaution in the setting of biological reference points.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/:

Process: National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. Target reference points for biomass and fishing mortality (harvest rate) have been developed for P. cod within the NPFMC 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 fishing mortality if reference points are approached or exceeded.

Current Status/Appropriateness/Effectiveness: The status of US fish stocks is determined by 2 metrics. The first is the relationship between the actual exploitation level and the overfishing level (OFL). If the exploitation level (or fishing mortality) exceeds the FOFL, the stock is considered to be subject to overfishing. The second is the relationship between the stock size and the minimum stock size threshold (MSST). If the stock size is below the MSST it is considered to be overfished. A stock is considered to be approaching an overfished condition when it is projected that there is more than a 50% chance that the biomass of the stock or stock complex will decline below the MSST within 2 years.

Harvest specifications for each of the P. cod stocks are made annually by NPFMC, and include the OFL, acceptable biological catch (ABC), and total allowable catch (TAC). The NPFMC management plans classify each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. The Tier system specifies the maximum permissible ABC and the OFL for each stock in the complex (usually individual species but sometimes species groups). The BSAI and GOA groundfish fishery management plans have pre-defined harvest control rules (HCR) that define a series reference points for groundfish covered by these plans. The overall objectives of the management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty.

In Tiers 1–3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. Most of the larger and commercially important stocks under NPFMC management are in Tier 3, which has sufficient information to determine surrogates for MSY-based reference points. The term “ $FX\%$ ” refers to the fishing mortality rate (F) associated with an equilibrium level of spawning per recruit equal to $X\%$ of the equilibrium level of spawning per recruit in the absence of any fishing. For tier 3, the term $B40\%$ refers to the long-term average biomass that would be expected under average recruitment and $F=F40\%$. These 2 metrics can thus be considered as targets. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so although MSY cannot be estimated with confidence, the MSY proxy level is defined as $B35\%$ and the MSST level is one-half of $B35\%$. Note that Tier 3 is split into 3 components, based on biomass level, and that the harvest control rule specifies a decline in fishing mortality when the stock biomass drops below the target level of $B40\%$ rather than at $B35\%$.

The state P. cod fisheries are managed by ADFG and BOF using an annual Guideline Harvest Level (GHL) set as a percentage of the federal ABC for GOA P. cod (split 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 NPFMC FMP for BSAI Groundfish, shows the tier system and harvest control rules used to determine FOFL. A similar table exists for FABC calculation in the FMP, and the portion relevant to Tier 3 stocks is as follows:

Tier 3 Information available: reliable point estimates of B , $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$$\max F_{ABC} = F_{40\%}$$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$$\max F_{ABC} = F_{40\%} \times (B/B_{40\%} - \alpha) / (1 - \alpha)$$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$$\max F_{ABC} = 0$$

Evidence Basis: The BSAI and GOA groundfish FMPs¹⁸³ contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the reference points. Extensive analysis (e.g. a series of standard projections) is conducted in each stock assessment to determine the current and projected biomass level relative to the MSY-based target reference points. Spawning biomass projected for 2017 for both GOA and EBS P. cod stocks (Tier 3a) was above the B40% reference point, placing the stocks in Tier 3a. Biomass for AI P. cod was above the OFL level in 2016. Based on the information in the 2016 SAFE documents, none of the 3 P. cod stocks had overfishing occurring, as per the standard definitions applied to each stock. For the Tier 3 stocks (EBS and GOA), the additional determinations could be made that neither stock was overfished, or approaching an overfished condition.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: NPFMC 2017

Non-Conformance Number (if relevant):

6.2 States shall establish safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions should be taken to decrease the fishing mortality (or its proxy) below that limit reference point.

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>No safe limit reference points for exploitation have been established.</p> <p>Lacking in all parameters.</p>	<p>Limit reference point is established but considered insufficiently safe, and measures taken are insufficient to ensure that it will not be exceeded.</p> <p>Lacking in two parameters.</p>	<p>Limit reference point is established but considered moderately safe, and measures taken are moderate to ensure that it will not be exceeded.</p> <p>Lacking in one parameter.</p>	<p>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,</p>

¹⁸³ NPFMC GOA FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmppdf>



		<p>actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. Fulfils all parameters.</p>
<p>Evaluation Parameters Process: A scientifically based limit reference point or proxy has been officially established, together with the measure to be taken to ensure it will not be exceeded.</p> <p>Current Status/Appropriateness/Effectiveness: The stock under assessment shall not currently be overfished (as defined by the competent Alaska authorities) according to the best available scientific understanding. The stock is currently estimated to be on the sustainable side of this reference point (e.g. SSB is above limit reference point, F is below F_{lim}, etc.). The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. There are mechanisms in place (e.g. harvest control rule or mechanism) to ensure that the level of fishing pressure is reduced if the limit reference point is approached or reached, and these mechanisms are consistent with ensuring to a high degree of certainty that the limit reference point will not be exceeded and that actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. The level of F_{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 F_{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 shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska and scored accordingly within the assessment.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.</p>		
<p>Evaluation (per parameter)/: Process: National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. If the exploitation level (or fishing mortality) exceeds the FOFL limit, the stock is considered to be subject to overfishing. If the stock size is below the MSST threshold it is considered to be overfished, and a rebuilding plan is called for. Limit reference points for biomass and fishing mortality (harvest rate) have also been developed for P. cod within the NPFMC precautionary approach management system based on sound scientific analyses. An optimal yield (OY) reference point has also been established for each sum of all yields in the GOA and BSAI. Managers can apply technical measures to reduce fishing mortality if reference points are approached or exceeded.</p> <p>Current Status/Appropriateness/Effectiveness: In the NPFMC tier system, the P. cod stocks in EBS and GOA are currently managed under Tier 3, while AI. P. 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 Acceptable Biological Catch (ABC) and OFL. The harvest control rule is biomass-based, for which fishing mortality is constant when biomass is above the B40% target and declines linearly down to the threshold value when biomass drops below the target, consistent with the precautionary approach. Below the limit specified in Tier 3c, the fishing mortality rate (FOFL) used to set the OFL is set to zero. The rule used to determine the ABC is applied in exactly the same manner, i.e. based on a harvest control rule triggered by targets and limits, and below the limit, maxFABC (fishing mortality) is set to zero. Note that the MSST threshold used to determine if a stock is overfished is a different reference point than those used in the NPFMC tier system. An incorrect interpretation of this reference point relative to the HCR in the NPFMC tier system was presented in Clause 6.1 of the previous RFM surveillance audit for this stock. NPFMC Groundfish FMPs for GOA and BSAI Regions also define a B20% threshold as follows: "For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed fishing is prohibited in the event that the spawning biomass of such a species is projected in the stock assessment to fall below B20% in the coming year".</p>		

Evidence Basis: The BSAI and GOA groundfish fishery management plans referenced above contain the details on the NPFMC precautionary approach, including the tier system, the HCR, and the limit and target reference points. GOA and EBS P. 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 2016 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 NPFMC FMPs state that if a stock is determined to be overfished, an FMP amendment or regulations will implemented to rebuild the stock or stock to the MSY level within a specified time period. This would include determining an FOFL and FMSY that will rebuild the stock within an appropriate time frame.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: NPFMC 2017, 2016 P. cod SAFE reports

Non-Conformance Number (if relevant):

6.3 Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the stock under consideration shall not be overfished (i.e. above limit reference point or proxy) and the level of fishing permitted shall be commensurate with the current state of the fishery resources, maintaining its future availability, taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing.

**FAO CCRF (1995) 7.5.3, 7.6.1
FAO Eco (2009) 29.2-29.2bis, 29.6, 30-30.2**

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no measurement of the position of the fishery in relation to the reference points exists, and maintenance of the level of fishing permitted is not commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. Lacking in all parameters.	The measurement of the position of the fishery in relation to the reference points is carried out, but the maintenance of the level of fishing permitted is insufficiently commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. Lacking in two parameters.	The measurement of the position of the fishery in relation to the reference points is carried out, but the maintenance of the level of fishing permitted is only moderately commensurate (i.e. avoiding overfishing) with the current state of the fishery resources. Lacking in one parameter.	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, taking into account that long term changes in productivity can occur due to natural variability and/or

			impacts other than fishing. Fulfils all parameters.	
Evaluation Parameters				
<p>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.</p> <p>Current Status/Appropriateness/Effectiveness: The current status of the stock in relation to reference points, is used to determine the level of fishing permitted, to ensure the latter is commensurate with the current state of the fishery resources (i.e. close to or above target reference point and most importantly, not overfished or below its limit reference point or proxy) taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing. The stock shall be ideally positioned above the midway point between target and limit reference point. It is important to clarify that, for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.</p>				
Evaluation (per parameter)/:				
<p>Process: NMFS/NPFMC has an extensive peer reviewed stock assessment program, which is necessary to monitor and measure the status of the P. 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.</p> <p>Current Status/Appropriateness/Effectiveness: Each 2016 SAFE report for P. cod describes the current fishing mortality rate, and stock biomass relative to the target and limit reference points. NPFMC FMPs specify the Overfishing Limits (OFL) and the Fishing mortality rate (FOFL) used to set OFL, Acceptable Biological Catch (ABC), and the fishing mortality rate (FABC) used to set ABC, the determination of each being dependent on the knowledge base for each stock. The GOA and EBS stocks are well above the B35% (MSY proxy) and B40% reference points, and therefore above MSST (defined as 1/2B35%). None of these stocks is overfished, has overfishing occurring, or is approaching an overfished condition. AI P. cod does not have overfishing occurring, which is the only metric used for Tier 5 stocks.</p> <p>Extensive oceanographic monitoring is carried out in conjunction with the various surveys in Alaskan waters, as described in Clause 4. Monitoring of the Pacific Decadal Oscillation (PDO) regimes, a standard indicator of productivity in the north Pacific, is conducted, along with analyses of its potential impacts on productivity of North Pacific stocks. Annual Ecosystem Reports for BSAI and GOA are presented to NPFMC.</p> <p>Evidence Basis: The SAFE documents provide full analyses of the status of P. cod stocks relative to all available reference points. The tables in Section 3.3 above, taken directly from the 2016 SAFE reports for each P. 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 P. cod are also contained in the SAFE documents.</p> <p>In addition, comprehensive Ecosystem Reports for EBS, AI, and GOA are presented to NPFMC annually (e.g. Zador (ed). 2016a, b, c for 2016 reports), which look at numerous elements of the Alaskan Ecosystems (see Clause 5.2 for more details). Each SAFE document for P. cod has a comprehensive Ecosystem section, which considers ecosystem effects on the stock, as well as fishery effects on the ecosystem.</p>				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: Zador 2016a, b, c.				

Non-Conformance Number (if relevant):

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

**FAO CCRF (1995) 7.5.3
FAO Eco (2009) 29.6, 30.2
FAO Eco (2011) 36.3**

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. Lacking in all parameters.	There is an insufficiently effective agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. Lacking in two parameters.	There is a moderately effective agreement of management actions in the eventuality that data sources and analyses indicate that reference points have been exceeded. Lacking in one parameter.	Management actions are agreed in the eventuality that data sources and analyses indicate that these reference points have been exceeded. Fulfils all parameters.

Evaluation Parameters

Process: There is an agreed process or system in the eventuality that the data sources and analyses indicate that these reference points have been exceeded.

Current Status/Appropriateness/Effectiveness: In the eventuality that the current level of the stock has exceeded target or limit reference point, the agreed management action (i.e., harvest control rule or framework) shall be immediately implemented and fishing reduced or halted as necessary. The harvest control rule is effective at keeping or bringing back the stock at acceptable biological levels (i.e. avoid overfishing).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/:

Process: NPFMC has developed Harvest Control Rules (HCR) which calls for specific management actions when reference points have been exceeded.

Current Status/Appropriateness/Effectiveness: The NPFMC management of P. 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 1/2 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 spawning biomass of such a species is projected in the stock assessment to fall below B20% in the coming year". Catch limits for the P. 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 NPFMC precautionary approach, including the tier system, the HCR, and the limit and target reference points. Extensive analysis is conducted in each stock assessment to determine the current and projected biomass level relative to the reference points, and to advise on the various catch levels appropriate to the HCRs. At present, the stocks are all well above the MSST values (not overfished), and the current ABCs for GOA and EBS P. cod were set based on the stocks being above B40%, i.e. in Tier 3a. For AI P. cod, biomass was above the OFL.

The following section on stock rebuilding is directly from the NPFMC FMP for BSAI Groundfish: Within two years of such time as a stock or stock complex is determined to be overfished, an FMP

amendment or regulations will be designed and implemented to rebuild the stock or stock complex to the MSY level within a time period specified at Section 304(e)(4) of the Magnuson-Stevens Act. If a stock is determined to be in an overfished condition, a rebuilding plan would be developed and implemented for the stock, including the determination of an FOFL and FMSY that will rebuild the stock within an appropriate time frame.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC FMPs, MSFCMA

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.5.1/7.5.4/7.5.5/12.3
FAO ECO (2009) 29.6/32
FAO Eco (2011) 36.7

7.1 The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. This should take due account of stock enhancement procedures, where appropriate. Absence of scientific information shall not be used as a reason for postponing or failing to take conservation and management measures. Relevant uncertainties shall be taken into account through a suitable method of risk assessment, including those associated with the use of introduced or translocated species¹⁸⁴.

FAO Eco (2009) 29.6
FAO Eco (2011) 36.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The precautionary approach is not applied to conservation, management and exploitation of living aquatic resources. Lacking in all parameters.	The precautionary approach is insufficiently applied to conservation, management and exploitation of living aquatic resources. Lacking in two parameters.	The precautionary approach is moderately applied to conservation, management and exploitation of living aquatic resources. Lacking in one parameter.	The precautionary approach is applied to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. Fulfils all parameters.

Evaluation Parameters

Process: There are management measures, regulations, and laws that command or direct for the use of the precautionary approach (PA) to conservation, management and exploitation of the aquatic resources under assessment. This could either take the form of an explicit commitment to the application of the PA, or could be evidenced by an over-arching approach applied throughout the management literature.

Current Status/Appropriateness/Effectiveness: There is evidence for the practical application of the PA to resource management and conservation. Note that the PA may be integrated in stock

¹⁸⁴ FAO Technical Guidelines for Responsible Fisheries No.2 – Precautionary approach to capture fisheries and species introductions.

assessment practices, in specific management measures enacted for everyday fisheries operations, or other measures. Application of the PA takes in due account of stock enhancement procedures, where appropriate, and relevant uncertainties are taken into account using a suitable method of risk assessment, including those associated with the use of introduced or translocated species.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans and other documents.

Evaluation (per parameter)/: Process: Precautionary approach-based reference points are used in the management of Alaskan P. cod stocks, and are stated in the NPFMC FMPs for the GOA and BSAI regions. Scientific information and stock assessments available are at a consistently high level, and clearly provide the necessary basis for conservation and management decisions. Uncertainties are taken into account in the stock assessment process, in the establishment of reference points, and risk assessment is used in providing harvest options.

Current Status/Appropriateness/Effectiveness: Precautionary approach-based reference points are used in the management of the P. 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-managed P. 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 NPFMC tier system precautionary approach documented in their FMPs, and stock status is evaluated against these calculated reference points in the annual stock assessment SAFE reports. Where possible, projections are carried out as part of the stock assessments to determine future trajectories of biomass, and related risks of overfishing. There are no stock enhancement, introduced or translocated species concerns for Alaskan P. cod.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

Non-Conformance Number (if relevant):

7.1.1 In implementing the precautionary approach, States shall take into account, *inter alia*, of uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.

FAO CCRF (1995) 7.5.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
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<p>There is no implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions.</p> <p>Lacking in two parameters.</p>	<p>There is moderate implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as, well as environmental and socio-economic conditions.</p> <p>Lacking in one parameter.</p>	<p>In implementing the precautionary approach, the State takes into account, <i>inter alia</i>, 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.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Process: There is a system in place under which the potential uncertainties listed above can be examined and taken into account during the decision-making process.
Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that in the fishery under assessment, uncertainties considered include those associated with the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans and other documents.

Evaluation (per parameter)/: **Process:** Potential uncertainties in the stock size, reference points, productivity, etc. are taken into account in the assessment process. Uncertainties in the management process re reference points, classification of stocks into precautionary approach tiers, setting of catch levels, etc. are explicit in the NPFMC FMPs.

Current Status/Appropriateness/Effectiveness: Scientists evaluate how fish stocks and user groups might be affected by fishery management actions. The assessments take into account uncertainty in such parameters as survey index data, mean weights at age, and stock-recruit relationship. Analyses evaluate stock status relative to reference points in a probabilistic way, and risks of exceeding reference points at current and projected stock sizes are explicitly presented in the catch option tables in each SAFE report. Extensive research on impacts of fishing, environmental factors, and socioeconomics is presented annually.

The overall objectives of the NPFMC management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty. The management plan classifies each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. The harvest control rules associated with these tiers consider the uncertainty associated with each level of information. Acceptable biological catch (ABC) is a level of a stock or stock complex’s annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and the ABC is set below the OFL. Total allowable catch (TAC) is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty. In the NPFMC approach, $TAC \leq ABC < OFL$.

Evidence Basis: There are numerous references and examples of how uncertainty is dealt with in the stock assessment of P. cod in the annual SAFE reports. Also, the NPFMCs fishery management plans (FMPs) for groundfish in GOA and BSAI regions are explicit in how different levels of uncertainty are accounted for in the management process. Environmental data and socioeconomic data are also well documented through annual SAFE reports, as outlined in previous clauses.

Regarding the distribution of fishing mortality, for the past several years, the ABC for GOA P. cod has been allocated among regulatory areas on the basis of the biomass distribution in the trawl surveys. The current apportionment, given in the 2016 SAFE, is 41% Western GOA, 50% Central, and 9% Eastern. The state-managed cod fisheries have GHs based on a percentage of the apportioned ABCs, for example, the cod fishery in state waters in Prince William Sound has a GH set at 25% of the Eastern GOA ABC. As noted by the SAFE authors, GOA P. 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). For AI P. cod, the SAFE authors note that the current Steller sea lion protection measures require an estimate of the proportion of the AI Pacific cod stock residing in Area 543, which will be used to set the harvest limit in 543 after subtraction of the State GH from the overall AI ABC. Based on the analyses shown in the SAFE, this percentage is currently around 25%.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: 2016 P. cod SAFE Reports

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.5.1, 12.3

FAO Eco (2009) 29.6/32

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
In the absence of adequate scientific information, appropriate research is not initiated in a timely fashion. Lacking in all parameters.	In the absence of adequate scientific information, appropriate research is sometime initiated in a timely fashion. Lacking in two parameters.	In the absence of adequate scientific information, appropriate research is often initiated in a timely fashion. Lacking in one parameter.	In the absence of adequate scientific information, appropriate research is initiated in a timely fashion. Fulfils all parameters.

Evaluation Parameters

Process: There is a process that identifies weaknesses in the scientific information available to fishery managers, and initiates additional research as necessary.

Current Status/Appropriateness/Effectiveness: There is evidence that such a process has been applied in the case of the fishery under assessment, including examples of initiated research. Depending on the situation, appropriate research or further analysis of the identified risk is initiated in a timely fashion.



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

Evaluation (per parameter)
Process: Stock assessments are reviewed on a number of levels, including externally. Where data gaps have been identified, the NMFS/AFSC and ADFG has ongoing research programs capable of addressing these needs. Organisations such as NPRB allow scientists from a number of disciplines and agencies to work collaboratively on a variety of fishery related studies in Alaskan waters, including some on P. cod. Research is also conducted by ADFG on the state-managed P. cod fisheries.

Current Status/Appropriateness/Effectiveness: The scientific information available for the P. 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/NPFMC stock assessments are of excellent quality, and are subjected to levels of peer review, including committees in NPFMC. The AFSC periodically requests a more comprehensive review of groundfish stock assessments by the Center of Independent Experts (CIE). These reviews are intended to lay a broader groundwork for improving the stock assessments outside the annual assessment cycle. The EBS and AI P. cod assessment was reviewed by three external reviewers from the CIE during February, 2016, and several recommendations from this review were incorporated into the 2016 assessment. Similarly, the GOA P. cod assessment was reviewed by CIE in 2011, along with the BSAI P. 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 P. cod assessment have detailed descriptions on how the CIE recommendations are dealt with in the assessment process.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: 2016 SAFE Reports; CIE Reviews

Non-Conformance Number (if relevant):

Not applicable.

7.2 In the case of new or exploratory fisheries, States shall adopt as soon as possible cautious conservation and management measures, including, inter alia, catch limits and effort limits. Such measures should remain in force until there are sufficient data to allow assessment of the impact of the fisheries on the long-term sustainability of the stocks, whereupon conservation and management measures based on that assessment should be implemented. The latter measures should, if appropriate, allow for the gradual development of the fisheries.

FAO CCRF (1995) 7.5.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
For new and exploratory fisheries, no procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and no provisions have	For new and exploratory fisheries, insufficiently effective procedures are in place for promptly applying precautionary management measures, including	For new and exploratory fisheries, moderately effective procedures are in place for promptly applying precautionary management measures, including	In the case of new or exploratory fisheries, States adopt as soon as possible cautious conservation and management measures, including, <i>inter alia</i> , catch limits and effort limits. Such measures

<p>been made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery.</p> <p>Lacking in all parameters.</p>	<p>catch or effort limits, and insufficient provisions have been made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery.</p> <p>Lacking in two parameters.</p>	<p>catch or effort limits, and moderate provisions have been made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery.</p> <p>Lacking in one parameter.</p>	<p>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. The latter measures allow, if appropriate, for the gradual development of the fisheries.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Note. This clause is only applicable for new or exploratory fisheries.
Process: For new or exploratory fisheries there is a process that allows the immediate application of precautionary management measures and provisions, including catch or effort limits, and for the impact assessment of such fisheries on the long-term sustainability of the stocks.
Current Status/Appropriateness/Effectiveness: There is evidence for the implementation of these catch and effort limits, and other management measures including the impact assessment performed for these fisheries.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or scientific reports.

Evaluation (per parameter)/: This clause is not applicable, as fisheries for p. cod in Alaska are well established.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>

References:

Non-Conformance Number (if relevant):

7.3 Contingency plans shall be agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the fishery resource. Such measures may be temporary and shall be based on best scientific evidence available.

FAO CCRF (1995) 7.5.5

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No contingency plan has been drawn up to introduce temporary management measures to ensure that fishing activity does not exacerbate serious	A contingency plan has been drawn up to introduce temporary management measures, but it is insufficiently effective to ensure	A contingency plan has been drawn up to introduce temporary management measures, but it is only moderately effective to ensure	Contingency plans are agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse

threats to the resource caused by natural phenomena.	that fishing activity does not exacerbate serious threats to the resource caused by natural phenomena.	that fishing activity does not exacerbate serious threats to the resource caused by natural phenomena.	environmental changes or other phenomena adversely affecting the fishery resource. Such measures may be temporary are based on best scientific evidence available.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is an agreed contingency plan to avoid serious threat to the resource.

Current Status/Appropriateness/Effectiveness: There is evidence of effectiveness for this contingency plan.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, regulations or other records.

Process: There are pre-agreed NPFMC harvest control rules in place to ensure overfishing does not occur on the P. cod stocks. Extensive provisions exist in the NMFS fishery regulations for in-season adjustments (e.g. gear modifications, fishery closures) where necessary to protect the resource from biological harm.

Current Status/Appropriateness/Effectiveness: Harvest control rules have been effective in controlling catch and fishing mortality for the Alaskan P. cod stocks. Stock biomasses are above reference points, and fisheries are performing well. Provisions for rebuilding plans are specified in the MSA should stock biomass drop below MSST threshold. NPFMC FMPs contain specific clauses that enable management actions when necessary, including in-season. The FMPs also note that information and data relating to stock status may become available to NPFMC during the course of a fishing year which warrants in-season adjustments to a fishery. Certain changes warrant swift action by NMFS to protect the resource from biological harm by instituting gear modifications or adjustments through closures or restrictions. Other changes warrant action to provide greater fishing opportunities for the industry by instituting time or area adjustments through openings or extension of a season beyond a scheduled closure. Other in-season actions may be necessary for interim fishery closures to reduce prohibited species (e.g. halibut, chinook salmon) bycatch rates and the probability of premature attainment of PSC limits.

Evidence Basis: NPFMC FMPs contain the following specific clause: "In the event that a stock or stock complex is determined to be approaching a condition of being overfished, an in-season action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to prevent overfishing from occurring"¹⁸⁵. The BSAI and GOA FMPs for groundfish also state: "For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed fishing is prohibited in the event that the spawning biomass of such a species is projected in the stock assessment to fall below *B20%* in the coming year". Probability of the P. cod stocks falling below this limit is provided in the SAFE documents where possible.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC 2017.

Non-Conformance Number (if relevant):

¹⁸⁵ NPFMC GOA FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmpp.pdf>

5.4 D. Management Measures

<p>8. Management shall adopt and implement effective management measures designed to maintain stocks at levels capable of producing maximum sustainable yields, including harvest control rules and technical measures applicable to sustainable utilization of the fishery and be based upon verifiable evidence and advice from available scientific and objective, traditional sources.</p> <p style="text-align: right;">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</p>			
<p>8.1 Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional, fisher or community sources.</p> <p style="text-align: right;">FAO CCRF (1995) 7.1.1 Others</p> <p>7.4.1/7.6.7</p> <p style="text-align: right;">FAO Eco (2009) 29.2/29.4 FAO Eco (2011) 36.2</p>			
<p>Low Confidence Rating (Critical NC)</p>	<p>Medium Confidence Rating (Major NC)</p>	<p>Medium Confidence Rating (Minor NC)</p>	<p>High Confidence Rating (Full Conformance)</p>
<p>There are no effective conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. Lacking in all parameters.</p>	<p>There are insufficiently effective conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. Lacking in two parameters.</p>	<p>There are moderately effective conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. Lacking in one parameter.</p>	<p>Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional, fisher or community sources. Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: The process by which management measures are developed for the fishery utilizes the best available scientific evidence, including traditional sources where these are verifiable, and also considers the cost-effectiveness and social impact of potential new measures.</p> <p>Current Status/Appropriateness/Effectiveness: There is evidence that the management measures in place are effective at achieving the long-term optimum yield, which is defined by the FAO as “the harvest levels for a species that achieves the greatest overall benefits, including economic, social and biological considerations”. If the stock has been maintained above the limit reference point this shall be taken as evidence that management measures are effective in avoiding overfishing.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports, fishery management plans, regulations or other management measures.</p>			
<p>Evaluation (per parameter)/: Process: Conservation and management measures in place ensure the long-term sustainability of the resources. FMPs which are based on the Magnuson-Stevens Act have objectives to prevent overfishing and promote sustainable and equitable use of the P. cod resource. NPFMC has established a science-based precautionary approach and harvest control rule and based on the scientific assessment of the stocks, uses this approach to determine appropriate harvest levels. The process utilizes the best available scientific evidence, and considers the cost-effectiveness and social impact of any potential new measures.</p>			

Current Status/Appropriateness/Effectiveness: National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and NPFMC follow a comprehensive Precautionary Approach (OFL, ABC, TAC, OY) to manage the federal P. 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 Groundfish FMPs contain long-term management objectives for the Alaska P. cod fishery. The biomass of P. cod stocks is well above the limit reference points, and thus management measures are effective in avoiding overfishing.

The state P. cod fisheries are managed by ADFG and BOF using an annual Guideline Harvest Level (GHL) set as a percentage of the appropriate federal ABC for P. cod and regulations are spelled out by BOF. Extensive cooperation exists between federal and state authorities in assessing and managing the P. cod stocks.

Evidence Basis: The MSFCMA¹⁸⁶ sets out the standards (e.g. optimal use and avoiding overfishing) which are followed in managing the P. cod fisheries in Alaska. FMPs for the GOA and BSAI Regions spell out the precautionary approach used by NPFMC in its management. The 2016 SAFE reports document the latest scientific information and assessment of P. cod stocks, including current and projected biomass and fishing mortality, and their position relative to the reference points. Economic considerations are also contained the 2016 SAFE reports, as noted in Clause 4.6 above.

Guiding principles for the BOF state-managed fisheries can be found here (5 AAC 28.263)¹⁸⁷, and includes provisions such as “conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock”. Details on the state P. cod fisheries can be found on the ADFG website, and include reports covering a wide range of issues pertaining to P. cod.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: MSFCMA -NMFS 1996; BOF 2017

Non-Conformance Number (if relevant):

8.1.1 Management targets are consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.

FAO Eco (2009) 29.2

FAO Eco (2011) 36.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
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¹⁸⁶ NMFS 1996 MSFCMA <http://www.nmfs.noaa.gov/sfa/magact/>

¹⁸⁷ BOF state-managed fisheries <http://www.touchngo.com/iglcnr/akstats/aac/title05/chapter028/section089.htm>

<p>Management targets are not consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.</p> <p>Lacking in all parameters.</p>	<p>Management targets are insufficiently consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.</p> <p>Lacking in two parameters.</p>	<p>Management targets are moderately consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.</p> <p>Lacking in one parameter.</p>	<p>Management targets are consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Process: There is a process that allows for the creation of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.
Current Status/Appropriateness/Effectiveness: **There is evidence of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.**
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/:
Process: NPFMC uses a multi-tier precautionary approach to management of P. cod, which includes Optimal Yield (multi-species) and MSY (single species) reference points, in the GOA and BSAI areas. The OY takes into consideration the total amount of fish that can be harvested from each area. Predator-prey relationships are considered.
Current Status/Appropriateness/Effectiveness: NPFMC uses a multi-tier precautionary approach, which includes Optimal Yield and MSY reference points. For P. cod under tier 3 management, F40% and B40% can be considered as target reference points. By definition, the optimum yield (OY) reference point is the amount of fish which: a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; b) is prescribed as such on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor; and c) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery.
 Within Alaskan state waters, ADFG permits a 'parallel fishery'¹⁸⁸ where the state allows fishing against the federal TAC. The state-managed P. cod resources also use a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey and ABC for the area. Although there is not a full suite of reference points for the P. cod fisheries in state waters, there are guideline objectives and management measures in place, and the state fisheries appear to be well managed.
Evidence Basis: For GOA and EBS P. cod, biomass in 2017 for both stocks are considered to be above B40%. OY is given as a range for the groundfish complexes in the BSAI and the GOA, and the sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. The range for BSAI is 1.4 to 2.0 million tons¹⁸⁹ while the range for GOA is 116 to 800 thousand tons¹⁹⁰. To prevent

¹⁸⁸ ADFG Commercial Fisheries <http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherygroundfish.main>

¹⁸⁹ NPFMC BSAI FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf>

¹⁹⁰ NPFMC GOA FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmppdf>

overfishing, NPFMC management objectives include the following measures specific to Optimum Yield: Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield; 2) continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries; and 3) provide for adaptive management by continuing to specify optimum yield as a range.

The NPFMC FMPs for BSAI and GOA groundfish state that “For groundfish species identified as key prey of Steller sea lions (i.e., walleye pollock, Pacific cod, and Atka mackerel), directed fishing is prohibited in the event that the spawning biomass of such a species is projected in the stock assessment to fall below *B*20% in the coming year”. There are a number of other SSL protection measures in place in various locations throughout BSAI and GOA, implemented by NMFS¹⁹¹, including areas closed to P. cod fishing for trawl and non-trawl gears. ADFG notes that co-management agreements have been established between the NMFS and the Aleut Marine Mammal Commission, the Traditional Council of St George Island and the Traditional Council of St Paul Island¹⁹².

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: ADFG 2017, NPFMC 2017.

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact.	There is insufficient evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact.	There is moderate evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact.	In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: The process by which management measures are developed for the fishery allows for consideration of the cost-effectiveness and social impact of potential new or modified management measures.

Current Status/Appropriateness/Effectiveness: There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.

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

Evaluation (per parameter)/:

Process: NPFMC FMPs for Alaskan groundfish recognize the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. The CDQ program exists to allocate a portion of allowable catches to coastal communities in Alaska. Industry has taken a number of measures which have led to elimination of the “race for fish” and improved cost effectiveness.

¹⁹¹ NOAA Steller Sea Lion protection measures <https://alaskafisheries.noaa.gov/fisheries/sslpm>

¹⁹² ADFG Steller Sea lion management <http://www.adfg.alaska.gov/index.cfm?adfg=stellersealion.management>

Current Status/Appropriateness/Effectiveness: The NPFMC FMPs include a substantial section on the economic and socioeconomic characteristics of the fisheries and communities in Alaska. There is a detailed annual SAFE report on economic status of Alaskan fisheries. Harvest levels for each groundfish species or species group that are set by the Council for a new fishing year are based on the best biological, ecological, and socioeconomic information available, and follow a rigorous and public peer-reviewed process.

The AFA affected the Alaskan fishing industry through overall capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish, and higher valued products. Amendment 80 went into effect in 2008 and divided groundfish target quotas and bycatch limits among cooperatives such as the Alaska Seafood Cooperative, AKSC¹⁹³. A number of cooperatives and coalitions have formed, such as the Freezer Longline Coalition (FLC). Their stated mission is to promote public policy that facilitates the intelligent and orderly harvest of Pacific cod and other groundfish species in the BS, AI and GOA, to encourage the reduction of waste and improvement of resource utilization in the longline fishery, to encourage the reduction of incidental catch of non-target species in the longline fisheries, to support research and public education about the longline fisheries, and to represent longline fishery interests in matters concerning the management and regulation of the longline fishery with respect to target species and protected resources. The FLC is a non-profit corporation that represents the owners and operators of the vessels that participate in the freezer longline, or catcher processor hook-and-line sector of the Pacific cod fishery in the federal waters of the BSAI and GOA Regions. The cooperatives that formed, e.g. the Alaska Seafood Cooperative, operate under a catch share program that allocates fixed amounts of Pacific cod, and other species in GOA and BSAI to the Cooperative. In return the fleet agreed to increase the amount of fish retained, to reduce bycatch and to promote sustainable fishing practices. By ending the race for fish and working cooperatively, the fleet now harvest more fish with fewer tows by targeting areas of high abundance.

The Western Alaska Community Development Quota (CDQ) Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. The CDQ Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities and the current allocation is 10% of the P. cod TAC. The effects of such measures on communities is regularly reviewed within NPFMC.

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

Evidence Basis: More information on AFA can be found here¹⁹⁴, while details were presented earlier on CDQ¹⁹⁵ and LLP¹⁹⁶ (see Clause 3.2.1). NMFS has numerous reports on the performance of the vessel cooperatives, including sections in the annual economic SAFE document (Fissel et. al 2016) noted previously. Information on the Freezer Longline Coalition¹⁹⁷ and catcher vessel intercooperative reports¹⁹⁸ can also be found on the NMFS website. Cooperatives have reported that with no “race for fish”, retention rates have increased, and bycatch rates have fallen.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: AKSC 2017, NMFS 2017, NPFMC 2017, NOAA 2017, FLC 2017

Non-Conformance Number (if relevant):

¹⁹³ Alaska Seafood Cooperative homepage <http://alaskaseafoodcooperative.org/>

¹⁹⁴ American Fisheries Act (AFA) <https://alaskafisheries.noaa.gov/fisheries/AFA-polloack>

¹⁹⁵ NPFMC CDQ Program <http://www.npfmc.org/community-development-program/>

¹⁹⁶ NOAA LLP <https://alaskafisheries.noaa.gov/fisheries/llp>

¹⁹⁷ Freezer Longline Coalition homepage <http://www.freezerlonglinecoalition.com/index.html>

¹⁹⁸ Cooperative reports <https://alaskafisheries.noaa.gov/sites/default/files/reports/cvintercoop2015.pdf>

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

FAO CCRF (1995) 7.4.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>Studies are not promoted on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient promotion of studies on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort.</p> <p>Lacking in two parameters.</p>	<p>There is moderate promotion of studies on the cost, benefits, and effects of alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort.</p> <p>Lacking in one parameter.</p>	<p>Studies are promoted which provide an understanding of the costs, benefits and effects of alternative management options designed to rationalize fishing, in particular, options relating to excess fishing capacity and excessive levels of fishing effort.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters
Process: There is a need and a process that allows, as appropriate, for studies to understand the costs, benefits, and effects of alternative management options designed to rationalize fishing.
Current Status/Appropriateness/Effectiveness: There is evidence for studies conducted on of alternative management options designed to rationalize fishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various evaluation or reports on fishing rationalization.

Evaluation (per parameter)/:
Process: Amendment 80 was approved by NPFMC in June of 2006, and enabled the formation of fishery cooperatives for trawl catcher/processors (CPs) that are not eligible under the American Fisheries Act (AFA) to participate in directed pollock fisheries. In addition to allowing a cooperative for the AM80 CPs, AM80 also resulted in a separate Trawl Limited Access (TLA) fishery for yellowfin sole, Pacific cod, and Atka mackerel in BSAI.

Current Status/Appropriateness/Effectiveness: Mechanisms have been established to reduce capacity to levels commensurate with sustainable use of the P. cod resource in Alaska. These include harvest control rules on the catch and effort management side, a license limitation program, and reduction of the number of vessels through industry-based initiatives. The industry-based measures have been taken to rationalize effort, eliminate derby-style fisheries, improve retention and utilization and reduce bycatch, and include the formation of groundfish cooperatives under Amendment 80. Some goals of Amendment 80 include reduction of by-catch and further rationalization of the fishery.

Evidence Basis: The Amendment 80 program was implemented in 2008 for certain groundfish catcher/processors in the Bering Sea/Aleutian Islands (BSAI) and provides an allocation of six groundfish species including P. cod. As well, the freezer longline fleet in the BSAI Region formed a voluntary cooperative (the Freezer Longline Conservation Cooperative or FLCC) in 2010, in an attempt to maximize the value of their allocation of P. cod. The number of active vessels in this fleet was stable between 2003 and 2009 at an average of approximately 39 vessels, but after the formation of the FLCC, only approximately 29-30 vessels continued to fish in 2011-2014. However the number of fishing days utilized increased, as the race for fish was eliminated (Fissel et al. 2016 Economic SAFE). Amendment 83 to the GOA FMP allocates the Pacific cod TAC in the Western and Central regulatory areas of the GOA among various gear and operational sectors, and eliminates inshore and offshore allocations in these two regulatory areas.

NPFMC regularly reviews the effectiveness of measures such as Amendment 80, and a detailed five year review was prepared in 2014 by Northern Economics ¹⁹⁹ for NPFMC.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: Fissel et al. 2016, Northern Economics report 2015.				
Non-Conformance Number (if relevant):				

8.2 States shall prohibit dynamiting, poisoning and other comparable destructive fishing practices.			
<i>FAO CCRF (1995) 8.4.2</i>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no prohibition of dynamiting, poisoning and other comparable destructive fishing practices.	There is insufficiently effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices.	There is moderately effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices.	The State prohibits dynamiting, poisoning and other comparable destructive fishing practices.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.
Evaluation Parameters			
Process: There are management measures, or regulations, or laws that prohibit destructive fishing practices.			
Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices.			
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and enforcement data.			
Evaluation (per parameter)/:			
Process: Management regulations prohibit destructive fishing practices.			
Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices, and there is no evidence that these practices are being used.			
Evidence Basis: As listed in the NPFMC FMPs and NMFS regulations, the only legal gears for taking P. cod in the Alaskan fisheries are pelagic trawl, bottom trawl, jig, longline, and pot. No destructive gears such as dynamite or poison are permitted, nor is there any evidence that such practices are being used illegally.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>

¹⁹⁹ <https://npfmc.legistar.com/View.ashx?M=F&ID=3300713&GUID=DB925E16-602F-41BD-8690-8156BEC4FB82>

Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: NOAA/NMFS Fishery regulations for Alaska https://alaskafisheries.noaa.gov/fisheries-679regs				
Non-Conformance Number (if relevant):				

8.3 States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements shall be made to consult all the interested parties and gain their collaboration in achieving responsible fisheries.

FAO CCRF (1995) 7.1.2, 7.1.6, 7.6.6

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>No attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource.</p> <p>Lacking in all parameters.</p>	<p>Insufficient attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource.</p> <p>Lacking in two parameters.</p>	<p>Moderate attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource.</p> <p>Lacking in one parameter.</p>	<p>States seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation and management of the resource, due recognition is given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements are made to consult all the interested parties and gain their collaboration in achieving responsible fisheries.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There is a process that allows for identifying and consulting with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource.

Current Status/Appropriateness/Effectiveness: In accordance with national laws and regulations, there is evidence that domestic parties having a legitimate interest in the use and management of the fishery (as described above) have been identified and encouraged to collaborate in the fisheries management process.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and meeting records.

Evaluation (per parameter)/:

Process: NPFMC and BOF have processes in place to allow for identifying and consulting with domestic parties having interest in the Alaskan P. cod fisheries.

Current Status/Appropriateness/Effectiveness: The NPFMC is responsible for allocation of the P. cod resource among user groups in Alaskan waters. In addition, the Alaskan Board of Fisheries (BOF) public meeting process provides a regularly scheduled public forum for all interested individuals, fishermen, fishing organizations, environmental organizations, Alaskan Native organizations and other governmental and non-governmental entities that catch P. cod off Alaska to participate in the development of legal regulations for fisheries. Organisations and individuals involved in the fishery and management process have been identified. The Alaska P. cod management process has many stakeholders, including Alaska P. cod license holders, processors, fishermen’s organizations, cooperatives, coalitions, the states of Alaska, Washington, and Oregon, CDQ groups, and environmental groups. Roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. The NPFMC process is the primary means for soliciting stakeholder information important to the fisheries, and this is fully transparent and open to the public. Proposals for management measures may come from the public, state and federal agencies, advisory groups, or Council members. Fishing industry stakeholders work extensively with fishery scientists, managers, and other industry members on various initiatives to ensure sustainability of the P. cod fisheries.

The NPFMC established a Rural Outreach Committee in 2009 to improve outreach and communications with rural communities and Alaska Native entities and develop a method for systematic documentation of Alaska Native and community participation in the development of fishery management actions. The Committee is to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; to provide feedback on community impacts sections of specific analyses, if requested; and to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. Initial priorities of the Committee included PSC reduction. Management actions taken to reduce salmon by-catches in a number of fisheries also explicitly acknowledge the importance of the salmon resources to the individuals and communities reliant on them.

The CDQ Program was created by the NPFMC in 1992 to provide western Alaska communities an opportunity to participate in the BSAI fisheries that had been foreclosed to them because of the high capital investment needed to enter the fishery. The CDQ Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. There are approximately 65 communities within a fifty-mile radius of the BS coastline who participate in the program.

Advisory Committees (AC) are local “grass roots” citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 84 advisory committees in the state. Of these, approximately 80% to 85% are “active”, meaning they regularly meet, write proposals, comment and attend BOF meetings.

Evidence Basis: Details on the NPFMC Rural Outreach Committee can be found here²⁰⁰. The CDQ information is on the NPFMC website²⁰¹. The enabling statute for the Advisory Committees system is AS 16.05.260. Regulations governing the AC are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97. More information on BOF and ADFG advisory process can be found here²⁰²

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
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²⁰⁰ <http://www.npfmc.org/committees/rural-outreach-committee/>

²⁰¹ NPFMC CDQ Program <http://www.npfmc.org/community-development-program/>

²⁰² BOF/ADFG Advisory process <http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory>

Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
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References: NPFMC 2017, BOF/ADFG 2017

Non-Conformance Number (if relevant):

8.4 Mechanisms shall be established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. Fleet capacity operating in the fishery shall be measured and monitored. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

FAO CCRF (1995) 7.1.8, 7.6.3, 8.1.2, 8.1.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are not established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource.	There is insufficient measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are insufficiently established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource.	There is moderate measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are moderately established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource.	There is collection of measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations.

Research has been conducted to determine or estimate the fishing capacity commensurate with the sustainable use of the resource. There are mechanisms in place to measure the total fishing capacity within the Unit of Certification, and to reduce this capacity if it is determined to exceed the sustainable level.

Current Status/Appropriateness/Effectiveness: There is evidence of the size of fleet capacity and of data describing fishing operation and that the mechanisms described above are successful at maintaining the effective fishing capacity of the Unit of Certification at a level commensurate with the sustainable use of the resource. Management mechanisms which restrict the application of fishing capacity, such as quotas, shall be considered valid mechanisms in relation to this parameter.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include, fleet reports or other documents or reports.

Evaluation (per parameter)/:

Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. There are mechanisms in place to measure the total fishing capacity, and to reduce it if it is determined to exceed the sustainable level. There are substantial effort controls and records of all fishing operations in the Alaskan fisheries through mechanisms such as the NPFMC Licence Limitation Program, and the Restricted Access Management Program administered by NMFS Alaska Regional Office.

Current Status/Appropriateness/Effectiveness: NPFMC, NMFS, and ADFG have determined the fishing capacity commensurate with the sustainable use of the P. cod resource, and stocks are above biomass reference points and not overfished in any way. Management mechanisms such as TACs and quota allocations, along with licence limitation and restricted access management, regulate the catch and amount of fishing effort applied to the stocks, and there is an overall OY cap in both GOA and BSAI regions which restricts the total amount of fish of all species that can be removed from these ecosystems. Fleet capacity and regularly updated data on all P. 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 such as Fissel et al. 2016), the cooperative reports, and NPFMC Groundfish FMPs for GOA and BSAI, are all documented in several previous clauses, provide the necessary evidence. Information on the Alaska Licence Limitation Program can be found here²⁰³.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: Fissel et al 2016, NMFS 2017

Non-Conformance Number (if relevant):

8.5 Technical measures shall be taken into account, where appropriate, in relation to:

- fish size
- mesh size or gear
- closed seasons
- closed areas
- areas reserved for particular (e.g. artisanal) fisheries
- protection of juveniles or spawners

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.	Insufficient technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.	Moderate technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.	Technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

²⁰³ NOAA/NMFS Fishery regulations for Alaska <https://alaskafisheries.noaa.gov/fisheries-679regs>

Process: The management system has taken into account technical measures, where and as appropriate to the fishery and stock under assessment, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.

Current Status/Appropriateness/Effectiveness: Technical measures are related to sustainability objectives, ensuring sustainable exploitation of the target stock, and minimizing the potential negative impacts of fishery activities on non-target species, ETP species, and the physical environment.

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

Evaluation (per parameter)/:

Process: The management system has taken into account various technical measures in relation to fish size, fishing gear, closed seasons and 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 P. 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 1998, full retention of P. cod is required in all Alaskan fisheries under the Improved Retention/Improved Utilization (IRIU) program. In addition, some vessels have made various gear modifications to avoid retention of smaller fish, and/or to minimize bottom contact. Maximum retainable amounts (MRA) are put in place to help manage bycatches in groundfish fisheries. Fishing industry groups such as cooperatives and coalitions have undertaken numerous conservation oriented measures in relation to fish size, bycatch avoidance, and product utilization.

Evidence Basis: A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs (e.g. see Table ES- 2 in the GOA FMP²⁰⁴). The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website²⁰⁵. These regulations cover all aspects of fishing, including seasons, gear limitations, and numerous area closures. There are specific rules laid out for P. 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 NPFMC FMPs for GOA and BSAI. Information on the IRIU Program can be found here²⁰⁶. A suite of measures specific to seabird avoidance in hook and line fisheries in Alaskan waters also exist²⁰⁷, 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 years²⁰⁸. Other industry-driven measures taken to reduce halibut catch include use of excluder devices, improved communication and data sharing among vessels to avoid halibut, and enhanced deck sorting to reduce mortality of halibut returned to the sea (Gauvin 2013²⁰⁹).

In 2016, NMFS reduced the maximum retainable amount (MRA) of skates using groundfish and halibut as basis species in the Gulf of Alaska (GOA) from 20 percent to 5 percent, as a necessary measure to limit the incidental catch and discards of skates in GOA groundfish and halibut fisheries²¹⁰. A 5 percent MRA means the maximum amount of skates retained on board the vessel must not exceed 5 percent of the round weight of other groundfish and halibut retained onboard a vessel. Information in the 2016

²⁰⁴ NPFMC GOA FMP <http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfm.pdf>

²⁰⁵ NMFS Fishery regulations for Alaska <https://alaskafisheries.noaa.gov/fisheries-679regs>

²⁰⁶ IRIU Regulations <https://alaskafisheries.noaa.gov/sites/default/files/679b27.pdf>

²⁰⁷ NMFS seabird avoidance regulations <https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf>

²⁰⁸ NPFMC by-catch management in GOA <https://www.npfmc.org/goa-trawl-bycatch-management/>

²⁰⁹ Gauvin. 2013 Deck Sorting report https://alaskafisheries.noaa.gov/sites/default/files/efp12-01halibut_a80.pdf

²¹⁰ NMFS MRA reduction <https://alaskafisheries.noaa.gov/node/53467>

SAFE reports for skate show that the skate resources in BSAI²¹¹ and GOA²¹² 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. Regarding the endangered Steller sea lions (SSL), the NPFMC has acted in a precautionary manner to place protection around rookeries and haulouts and close areas where fishing may impact SSL prey such as P. cod. ADFG has also implemented areas in state waters closed to fishing, e.g. around SSL rookeries.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC 2017, NMFS 2017, Gauvin 2013, Ormseth 2016a, b.

Non-Conformance Number (if relevant):

8.6 Fishing gear shall be marked in accordance with national legislation in order that the owner of the gear can be identified. Gear marking requirements shall take into account uniform and internationally recognizable gear marking systems.

FAO CCRF (1995) 8.2.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear marking systems.	There is insufficient gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear marking systems.	There is moderate gear marking, in accordance with national legislation in order that the owner of the gear can be identified, that takes into account internationally recognizable gear marking systems.	Fishing gear is marked in accordance with national legislation in order that the owner of the gear can be identified. Gear marking requirements take into account uniform and internationally recognizable gear marking systems.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is regulation for gear marking.

Current Status/Appropriateness/Effectiveness: Fixed gear is marked according to national legislation, and lost gear can be identified back to owner.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various fleet reports and regulations.

Evaluation (per parameter)/:

Process: There are NMFS regulations for gear marking in the Alaskan fisheries in GOA and BSAI.

Current Status/Appropriateness/Effectiveness: Fixed gear is marked according to regulations, which state:

- (a) Marking of hook-and-line, longline pot, and pot-and-line gear.

²¹¹ Ormseth 2016 BSAI skate SAFE <https://www.afsc.noaa.gov/REFM/Docs/2016/BSAIskate.pdf>

²¹² Ormseth 2016 GOA skate SAFE <https://www.afsc.noaa.gov/REFM/Docs/2016/GOAskate.pdf>

(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 P. cod fishery are established in NMFS and ADFG regulations, e.g. as prescribed in the annual management measures published in the Federal Register²¹³. There was no evidence raised/available that indicated the marking of gear is not being followed, or is not effective.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NMFS 2017

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.10

FAO Eco (2009) 30

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities.	There is insufficient allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities.	There is moderate allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities.	Measures are introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery/restoration of such stocks. Also, efforts are made to ensure that resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities are restored.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

²¹³ NMFS Fishery Regulations <https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf>

Process: There is a process that identifies depleted stocks, resources and habitats. A depleted stock is usually a stock which had undergone overfishing. Accordingly, stock status is below limit reference point and the ability of the stock to recover has been impaired.

Current Status/Appropriateness/Effectiveness: There is evidence that where depleted or adversely affected stocks, resources and habitats have been identified, efforts have been made to ensure they are restored or allowed to recover.

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

Evaluation (per parameter)/:

Process: The US laws governing the Alaskan P. cod fisheries are fully consistent with and supportive of a number of international laws and agreements related to fisheries management, such as the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the UN Straddling and Highly Migratory Fish Stocks Agreement, and the Convention on Biological Diversity. As noted in previous clauses, the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. NMFS and NPFMC follow a comprehensive PA (OFL, ABC, TAC, OY) to manage the federal fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations. Management measures are in place to ensure sustainability, and to allow rebuilding if stocks are overfished. Specific measures protect prohibited species such as halibut, various crabs, and chinook salmon, as well as Steller sea lions, exist in the P. cod fishery regulations.

Current Status/Appropriateness/Effectiveness: None of the P. cod stocks in Alaska are classified as overfished or undergoing overfishing, and none are in a depleted state. No destructive fishing practices are allowed in GOA or BSAI which would adversely impact habitat. With regard to other resources taken in the P. cod fishery, considerable work has been done to reduce catches of species such as halibut and Chinook salmon in trawl catches, as there are concerns with the status of Chinook in many rivers. Special management measures to protect marine mammals such as SSL exist, which call for no directed fishing on P. cod if biomass drops below the B20% threshold.

Evidence Basis:

Considerable work on deck sorting (Gauvin 2013) has occurred in recent years in certain trawl fisheries to improve the survival rates of halibut discarded at sea (required under regulation). Numerous measures to protect SSL populations and habitat affect are implemented in the FMPs for GOA and BSAI groundfish, and some are specific to the P. cod. These are discussed in detail in Clause 8.5 above. NMFS and NPFMC must describe and identify EFH in FMPs, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH²¹⁴.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Gauvin 2013, NPFMC 2017.

Non-Conformance Number (if relevant):

8.8 States and relevant groups from the fishing industry shall measure performance and encourage the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that sufficiently selective as to minimize catch, waste and discards of non-target species - both fish and non-fish species and impacts on associated or dependent species. The use of fishing gear and practices that lead to the discarding of catch shall be discouraged and the use of fishing gear and practices that increase survival rates of escaping fish shall be promoted. Inconsistent methods, practices and gears shall be phased out accordingly.

²¹⁴ NPFMC EFH <http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/>

FAO CCRF (1995) 7.2.2, 7.6.4, 7.6.9, 8.4.5, 8.5.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species.</p> <p>Lacking in two parameters.</p>	<p>There is moderate encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species.</p> <p>Lacking in one parameter.</p>	<p>States and relevant groups from the fishing industry measure performance and encouragement of the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that sufficiently selective as to minimize catch, waste and discards of non-target species - both fish and non-fish species and impacts on associated or dependent species. The use of fishing gear and practices that lead to the discarding of catch are discouraged and the use of fishing gear and practices that increase survival rates of escaping fish are promoted. Inconsistent methods, practices and gears are phased out accordingly.</p> <p>Fulfils all parameters.</p>
<p>Evaluation Parameters</p> <p>Process: The management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to reduce waste and discard of the target species. 'Relevant groups' includes fishers, processors, distributors 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.</p> <p>Current Status/Appropriateness/Effectiveness: Such technologies and operational methods have been implemented. The methods in use are effective in reducing waste and discards of the target species. There is evidence that the gears used in the fishery are appropriate, in terms of selectivity, environmental impact and cost-effectiveness, as assessed by the responsible scientific authority of the fishery. Methods shall be considered successful if there is evidence that the fishery under assessment is not causing significant risk of overfishing to non-target species.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various reports, regulations or other data.</p>			
<p>Evaluation (per parameter)/:</p> <p>Process: The NPFMC/NMFS/ADFG management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to improve gear selectivity, and to reduce waste and discard of the P. cod species, such as the IRIU program, and utilization of distinct areas and time periods (seasons) to manage the fisheries. The selectivity, environmental impact and cost-effectiveness of fishing gears is measured, analysed, and monitored in a number of ways, including extensive analysis and reporting of data in the SAFE documents, the EFH work, and at-sea enforcement of regulations.</p>			

Current Status/Appropriateness/Effectiveness: Numerous technologies and operational methods have been implemented in the P. cod fisheries to reduce waste and discards of non-target species. A number of earlier studies have been carried out re halibut excluder devices in trawls, and EFPs allow deck sorting of halibut to see if survival of released halibut can be improved. Measures have been introduced to reduce or avoid Chinook salmon bycatch.

Evidence Basis:

Exempted fishing permits have been issued for deck sorting on Amendment 80 Catcher Processors to reduce halibut mortality. Reports covering some of these EFP results have been published (e.g. Gauvin 2013). P. cod is also taken as bycatch in some flatfish trawl fisheries, and some of these fisheries are required to use trawl gear which raises the trawl sweep lines off the sea floor, reduces net size, and utilizes semi-pelagic trawl doors. This reduces benthic habitat effects and reduces fuel consumption.

In 2015, Amendment 97 established annual Chinook salmon PSC limits for the groundfish trawl fisheries, except for pollock trawl fisheries, in the Western and Central GOA. This action established annual Chinook salmon PSC limits for various fleet sectors and also established incentives for reducing Chinook salmon PSC for the trawl C/P and Non-Rockfish Program CV sectors, and established seasonal Chinook salmon PSC limits for the trawl C/P sector²¹⁵. The majority of chinook by-catch in GOA is from the pollock fishery, and a recent supplementary Biological Opinion concluded that groundfish fisheries in the GOA were not likely to jeopardize the continued existence of threatened Chinook stocks (NMFS 2012²¹⁶). Amendment 103 to the GOA FMP, passed in September 2016²¹⁷, allows NMFS to reapportion unused Chinook salmon prohibited species catch (PSC) within and among specific trawl sectors in the Central and Western Gulf of Alaska (GOA), based on specific criteria and within specified limits. This rule does not increase the current combined annual PSC limit of 32,500 Chinook salmon that applies to Central and Western GOA trawl sectors, and promotes more flexible management of GOA trawl Chinook salmon PSC. NPFMC are considering additional management measures to address the Chinook limits for some GOA fisheries.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: Gauvin 2013, NMFS 2012, 2016, 2017;

Non-Conformance Number (if relevant):

8.9 Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques shall be applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste.

FAO CCRF (1995) 7.2.2, 8.4.6, 8.4.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Pollution, waste, and catch by lost or abandoned gear is not minimized. Lacking in all parameters.	Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective	Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective	Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective

²¹⁵ NMFS Chinook bycatch management <https://alaskafisheries.noaa.gov/fisheries/chinook-salmon-bycatch-management>

²¹⁶ NMFS 2012. Supplemental Biological Opinion

²¹⁷ Amendment 103 to GOA FMP . <https://alaskafisheries.noaa.gov/sites/default/files/81fr62659.pdf>

	fishing gear and techniques are insufficiently applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. Lacking in two parameters.	fishing gear and techniques are moderately applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. Lacking in one parameter.	fishing gear and techniques are applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. Fulfils all parameters.
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Evaluation Parameters

Process: There has been development of technologies, materials and operational methods that minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear and a system to minimize pollution, waste, catch by lost or abandoned gear.

Current Status/Appropriateness/Effectiveness: Technologies, materials and operational methods that minimize the loss of fishing gear and ghost fishing are applied whenever appropriate. Also, these measures are effective in minimizing, to the extent practicable, pollution, waste, and catch by lost or abandoned gear.

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

Evaluation (per parameter)/:

Process: Operational methods and gears regulated in the Alaskan P. 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 P. cod fisheries in Alaska. Thus there is no ghost fishing from these forms of fishing gear in the P. cod fisheries. As well, there is minimal ghost fishing from gear loss in trawl fisheries.

Evidence Basis: NPFMC FMPs outline the allowable fishing gears allowed in the Alaskan pollock fisheries, and no gillnetting is permitted for P. cod. Evidence provided by fishing fleets indicates that lost fishing gear is minimal. An NOAA study²¹⁸ shows ghost fishing mortality 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 P. cod fisheries substantially reduces the impact on bottom habitats and bycatch of many bottom dwelling species. Longline is typically not associated with as much ghost fishing as some other fishing gears, such as gillnets and some types of traps (NOAA 2015). The previous clause contains information on several measures aimed at reducing bycatch/waste and improving the selectivity of fisheries for P. cod. NMFS regulations²¹⁹ 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 P. cod fishery, however, it has been reported that in some locations there were periodic lost pot recovery programs.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NOAA 2015, NMFS 2017

Non-Conformance Number (if relevant):

²¹⁸ NOAA ghostfishing document https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf

²¹⁹ NMFS Fishing gear regulations https://alaskafisheries.noaa.gov/sites/default/files/part679_all.pdf

<p>8.10 The intent of fishing selectivity and fishing impacts related regulations shall not be circumvented by technical devices and information on new developments and requirements shall be made available to all fishers.</p> <p style="text-align: right;">FAO CCRF (1995) 8.5.1</p>				
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)	
<p>Information on new developments and requirements is not made available to all fishers.</p> <p>Lacking in all parameters.</p>	<p>Information on new developments and requirements is insufficiently made available to all fishers.</p> <p>Lacking in two parameters.</p>	<p>Information on new developments and requirements is moderately made available to all fishers.</p> <p>Lacking in one parameter.</p>	<p>The intent of fishing selectivity and fishing impacts related regulations is not circumvented by technical devices and information on new developments and requirements is made available to all fishers.</p> <p>Fulfils all parameters.</p>	
<p>Evaluation Parameters</p> <p>Process: There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulation.</p> <p>Current Status/Appropriateness/Effectiveness: The adopted methods are successful and effective making known fishing regulation to the participants. Enforcement data are highlighting significant violations.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.</p>				
<p>Evaluation (per parameter)/:</p> <p>Process: Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of NPFMC, NOAA/NMFS, and ADFG, and through various meetings, mailouts, etc. Fishing gear is regulated and monitored through these agencies, and data on compliance is recorded and published.</p> <p>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 P. cod, and are designed not to impede escaping fish.</p> <p>Evidence Basis: There is no evidence that regulations involving gear selectivity in the P. cod fisheries are being circumvented either by omission, or through the illegal use of gear technology.</p>				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

Not applicable

8.11 Assessment and scientific evaluation shall be carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations. Accordingly, the effects of such introductions shall be monitored.

FAO CCRF (1995) 8.4.7, 12.11

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are not considered prior to its introduction. Lacking in all parameters.	The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are insufficiently considered prior to its introduction. Lacking in two parameters.	The implications of commercial scale introductions of a new gear or fishing operations on the fish habitat are moderately considered prior to its introduction. Lacking in one parameter.	Assessment and scientific evaluation is carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations. Accordingly, the effects of such introductions are monitored. Fulfils all parameters.

Evaluation Parameters
 Note: this clause is not applicable if new gear has not been introduced in the past 3 years.
Process: New gear has been recently introduced on a commercial scale within the last 3 years, or there is a plan to introduce new gear in the forthcoming future.
Current Status/Appropriateness/Effectiveness: An appropriate assessment of potential risks has been carried out. There is evidence to suggest that the assessment is adequate to support habitat conservation and fishery management purposes. Additionally, there is a monitoring regime in place.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation (per parameter)/: This clause is not applicable as no new gear has been introduced in the past 3 years.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.5.4

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

International cooperation is not encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in all parameters.	International cooperation is insufficiently encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in two parameters.	International cooperation is moderately encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in one parameter.	International cooperation is encouraged with respect to research programs for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology. Fulfils all parameters.
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Evaluation Parameters

Process: There is a system of international information exchange to allow knowledge to be shared

Current Status/Appropriateness/Effectiveness: There is evidence for international information exchange, such as meeting records or other information.

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

Evaluation (per parameter)/: Process: The fishery for P. cod in Alaska is conducted by US vessels only. In adjacent waters of the GOA cooperation on P. cod research and management between Canada and USA occurs as part of the science and management process.

Current Status/Appropriateness/Effectiveness: The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee was formed in 1960 to coordinate fishery and scientific information resulting from the implementation of commercial groundfish fisheries operating in US and Canadian waters off the West Coast. The TSC meets annually, reviews the effectiveness of existing regulations, and allows exchange of information on the status of groundfish stocks of mutual concern and to coordinate wherever possible programs of research, such as surveys, age reading, gear research, etc.

Evidence Basis: Information on the Canada-USA cooperation, including various meeting reports, can be found in Clause 5.3

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: TSC 2017.

Non-Conformance Number (if relevant):

8.13 States and relevant institutions involved in the fishery shall collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species in relation to such fishing gear as an aid for management decisions and with a view to minimizing non utilized catches.

FAO CCRF (1995) 8.5.3/12.10

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no standard methodologies developed for studies on fishing gear selectivity and methods	There are insufficient standard methodologies developed for studies on fishing gear	There are moderate standard methodologies developed for studies on fishing gear	States and relevant institutions involved in the fishery collaborate in developing standard methodologies for

been decided by States and relevant institutions involved.	selectivity and methods been decided by States and relevant institutions involved.	selectivity and methods been decided by States and relevant institutions involved.	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.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfills all parameters.

Evaluation Parameters

Process: There is collaborative research into fishing gear selectivity, fishing methods and strategies.

Current Status/Appropriateness/Effectiveness: There is evidence of such research, and the results have been applied accordingly in fisheries management.

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

Evaluation (per parameter)

There is considerable collaborative research into fishing gear selectivity, fishing methods and strategies in the P. cod fisheries in Alaska. Organizations involved include various fishing industry groups, NMFS, ADFG, University of Alaska, and NPRB.

Current Status/Appropriateness/Effectiveness: There are numerous measures implemented in Alaskan fisheries to minimize non-utilized catches, such use prohibition of discarding (IRIU program), use of salmon and halibut excluder devices in trawl nets, and use of streamers on longline gear to reduce seabird bycatch. Many of the studies and subsequent implementation have involved cooperative efforts between researchers at institutions in NMFS, ADFG, universities, and industry, and are introduced into regulations only after extensive testing has occurred.

Evidence Basis: As reported by Gauvin et al. (2013)²²⁰ in work conducted under the North Pacific Fisheries Research Foundation, salmon excluder designs have evolved considerably since experimental trials in the Bering Sea started in the fall of 2003. Mainly used by the pollock fleets, design changes have been influenced by a suite of exempted fishing permit (EFP) tests and by feedback from fishermen using the various designs over the years since the EFPs started. For halibut, recent EFPs for testing of deck sorting have been allowed in order to improve survival rates of released halibut in some trawl fisheries. Further information on these studies can be found in the reports referenced in Clause 8.8 above. ADFG has also done research on cod pots, in studies to see if Tanner crab bycatch could be reduced while maintaining cod catch rates²²¹.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Gauvin et al 2013, ADFG 1998.

Non-Conformance Number (if relevant):

Not applicable

8.14 Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States shall ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical

²²⁰ Gauvin et al. 2013 http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

²²¹ ADFG study on cod pots <http://www.adfg.alaska.gov/FedAidPDFs/RIR.4K.1998.45.pdf>

location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.

FAO CCRF (1995) 8.11.1, 8.11.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There are no policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. No care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.</p> <p>Lacking in all parameters.</p>	<p>There are insufficiently effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. Insufficient care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.</p> <p>Lacking in two parameters.</p>	<p>There are moderately effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. Moderate care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.</p> <p>Lacking in one parameter.</p>	<p>Policies are developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

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

Process: There is a mechanism in place for identifying potential for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. This mechanism ensures that where artificial structures are deemed appropriate, environmental protection, safety, and navigation are considered in their application.

Current Status/Appropriateness/Effectiveness: This mechanism has been applied to the fishery under assessment, resulting either in the conclusion that artificial structures are inappropriate or in the use of artificial structures. Care has been taken in the selection of materials to use in constructing artificial reefs, the selection of sites for their deployment and to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.

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

Evaluation (per parameter)/: This clause is not applicable to P. cod

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 8.1.7/8.1.10/8.2.4/8.4.5

9.1 States shall enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.

FAO CCRF (1995) 8.1.7/8.4.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>No education and training programs for fishers have been implemented that meet international standards and guidelines.</p> <p>Lacking in all parameters.</p>	<p>Insufficiently effective education and training programs for fishers have been implemented that meet international standards and guidelines.</p> <p>Lacking in two parameters.</p>	<p>Moderately effective education and training programs for fishers have been implemented that meet international standards and guidelines.</p> <p>Lacking in one parameter.</p>	<p>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.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters
Process: There are implemented education programs for fishers.
Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.

Evaluation (per parameter)/:
Process: There are several available education programs for fishers.

Current Status/Appropriateness/Effectiveness: The North Pacific Fishing Vessel Owners Association (NPFVOA) provides a large and diverse training program that many of the professional crew members must pass. Training ranges from firefighting on a vessel, damage control, man-overboard, MARPOL, etc., and the Sitka-based Alaska Marine Safety Education Association alone has trained more than 10,000 fishermen in marine safety and survival through a Coast Guard-required class on emergency drills. Captains and some officers on the larger pollock vessels require certain levels of navigational certification. The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska’s Institute of Technology). One of AVTEC’s main divisions is the Alaska Maritime Training Center, which promotes safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry.

Also, the University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. MAP also conducts sessions of their Alaska Young Fishermen’s Summit. In addition to this, MAP provides training and technical assistance to fishermen and seafood processors in Western Alaska. A number of training courses and workshops were developed in cooperation with local communities and CDQ groups. Additional education is provided by the Fishery Industrial Technology Center, in Kodiak, Alaska.

Evidence Basis: NPFVOA²²², AVTEC²²³, University of Alaska Sea Grant Marine Advisory Program (MAP)²²⁴, Fishery Industrial Technology Center²²⁵

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPVOA 2017, AVTEC 2017, UAF Sea Grant 2017, FITC 2017

Non-Conformance Number (if relevant):

9.2 States, with the assistance of relevant international organizations, shall endeavor to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF (1995), as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.

FAO CCRF (1995) 8.1.10

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no education and training measures making fishers aware of the key provisions of FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	There are insufficient education and training measures making fishers aware of the provisions of the key FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	There are moderate education and training measures making fishers aware of the provisions of the key FAO CCRF and other applicable environmental and other standards essential for responsible fisheries.	States, with the assistance of relevant international organizations, endeavor to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the FAO CCRF, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

²²² NPVOA homepage <http://npfvoa.org/>

²²³ AVTEC homepage <http://www.avtec.edu/>

²²⁴ UAF Sea Grant MAP <http://seagrants.uaf.edu/map/fisheries/>

²²⁵ Fishery Industrial Technology Center <http://www.sfos.uaf.edu>



<p>Evaluation Parameters Process: There are relevant measures of the code and other applicable environmental and other standards being exposed to fishers for their training. Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines and key CCRF principles. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.</p>				
<p>Evaluation (per parameter)/: Process: All regulations governing the P. cod fisheries are available on the NPFMC, NMFS, and ADFG websites, and the results of any changes are widely discussed and communicated. AKD/NMFS engages in outreach to fishers and industry personnel, providing current regulatory information and guidance to promote compliance and responsible fisheries. Current Status/Appropriateness/Effectiveness: All rules and regulations governing Alaskan P. cod fisheries, including those dealing with responsible fishing methods, are readily available on NMFS, NPFMC, and ADFG websites. To increase communications and understanding between the regulated users and enforcement personnel, the Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) strives to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, AKD contacts thousands of harvesters and industry personnel at organized events, including trade shows, and responded to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and responsible fisheries. Evidence Basis: A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs for those two regions. These also cover legal definitions such as quota shares, IFQ's, etc. The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website²²⁶. These regulations cover all aspects of fishing, including seasons, gear limitations, and numerous area closures.</p>				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: NMFS 2017				
Non-Conformance Number (if relevant):				

<p>9.3 States shall, as appropriate, maintain records of fishers which shall, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws.</p> <p style="text-align: right;">FAO CCRF (1995) 8.1.8</p>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no records kept of fishers, including wherever possible, qualification in accordance with their national laws.	There are insufficient records kept of fishers, including wherever possible, qualification in accordance with their national laws.	There are moderately appropriate records kept of fishers, including wherever possible, qualification in accordance with their national laws.	The State maintains, as appropriate, records of fishers which, whenever possible, contain information on their service and qualifications, including certificates of competency, in

²²⁶ NMFS Fishery Regulations <https://alaskafisheries.noaa.gov/fisheries-679regs>

Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	accordance with their national laws. Fulfils all parameters.	
Evaluation Parameters Process: There is a system to collect and maintain fishermen records. Current Status/Appropriateness/Effectiveness: These records are considered accurate and effective for management purposes. Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.				
Evaluation (per parameter) Process: There is a comprehensive system in place to collect and maintain fishermen records. Current Status/Appropriateness/Effectiveness: Detailed data on the number and location of Alaskan fishers, vessels, permits issued, etc. can be found in the annual SAFE documentation on economics of the fishery. Certain information on Alaskan fisheries has been compiled through the Alaska Fisheries Information Network (AKFIN), although selected studies may not be publicly available as some information is confidential. Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska’s Commercial Fisheries Entry Commission website. Fishermen in the state-managed fisheries must register prior to fishing and are required to keep a logbook during the fishery. Completed logbook pages must be attached to the ADFG copy of the fish ticket at the time of delivery. Evidence Basis: Data on the number and location of Alaskan of fishers, permits issued, etc. can be found in Fissel et al. 2016. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network for Alaska Fisheries (AKFIN) ²²⁷ . Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska’s CFEC website ²²⁸ .				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: AKFIN 2017, CFEC 2017.				
Non-Conformance Number (if relevant):				

²²⁷ AKFIN <http://www.akfin.org/home/>

²²⁸ CFEC https://www.cfec.state.ak.us/fishery_statistics/earnings.htm

5.5 E. Implementation, Monitoring and Control

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

FAO CCRF (1995) 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1

FAO ECO (2009) 29.5

FAO Eco (2011) 36.6

10.1. Effective mechanisms shall be established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programs, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified.

FAO CCRF (1995) 7.1.7 Others 7.7.3/8.1.1

FAO Eco (2009) 29.5

FAO Eco (2011) 36.6

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There are no mechanisms established for fisheries monitoring, surveillance and control.</p> <p>Lacking in all parameters.</p>	<p>There are insufficiently effective mechanisms established for fisheries monitoring, surveillance and control.</p> <p>Lacking in two parameters.</p>	<p>There are moderately effective mechanisms established for fisheries monitoring, surveillance and control.</p> <p>Lacking in one parameter.</p>	<p>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.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There are mechanisms established for fisheries monitoring, surveillance, control and enforcement.

Current Status/Appropriateness/Effectiveness: These mechanisms are effective, and include effective observer, inspection scheme, and vessel monitoring schemes where appropriate for the type of fishery under assessment. Monitoring, surveillance, control and enforcement mechanisms can be considered effective if they are sufficiently broad to cover the entirety of the Unit of Certification, there is evidence that rules and regulations are consistently enforced, and there is no evidence of frequent or widespread violation of fishery regulations. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. With respect to fisheries in the high seas, the legal obligations of UNCLOS and UNFSA have particular relevance. Evidence of the performance of the legal framework can be derived from the assessment of conformance with requirements covering compliance and enforcement.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include rules and regulations, enforcement reports.

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

Process:

The US Coast Guard (USCG)²²⁹, NMFS Office of Law Enforcement (OLE)²³⁰ and Alaska Wildlife Troopers (AWT)²³¹ (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 (VMS) are in operation²³² within the fisheries and developmental work is on-going with respect to additional electronic monitoring (EM) technologies²³³.

Current Status/Appropriateness/Effectiveness:

Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE²³⁴ and the USCG²³⁵ (17th District USCG). The AWT²³⁶ 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 679²³⁷]).

The OLE in Alaska²³⁸ focuses on outreach and education programs to help the fishing industry understand the rationale for regulations and prevent or minimize infractions. The OLE enforcement staffing levels have recently increased; sixteen special agents and enforcement officers now operate in the Alaska region. The NMFS Alaska Region OLE reports few major compliance issues (pers. comm. Nathan Lagerwey - OLE).

OLE agents/officers have the option to provide a written warning for minor offences however, these are taken into account for repeat offenders. More serious offences can be dealt with by a summary settlement, i.e. a violation which is not contested and results in a ticket which may include a discounted fine, thus allowing the violator to quickly resolve the case without incurring legal expenses. Thereafter, an offence is referred to NOAA's Office of General Counsel (OGC) for Enforcement and Litigation which can impose a sanction on the vessels permit or further refer the case to the US Attorney's Office for criminal proceedings. Penalties may range from severe monetary fines, boat seizure and/or imprisonment (pers. comm. Nathan Lagerwey - USCG). The MSA has an enforcement policy section (50 CFR 600.740²³⁹) that details these "remedies for violations".

The USCG²⁴⁰ is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District²⁴¹ 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 (pers. comm. Stephen White - USSG). The Pacific cod fishery is considered to be a relatively low risk fishery, with the potential for PSC bycatch, in particular halibut and salmon, at certain times of the year being the main issue, however, voluntary compliance, i.e. recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue (pers. comm. Nathan Lagerwey). 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

²²⁹ <https://www.uscg.mil/d17/>

²³⁰ <http://www.nmfs.noaa.gov/ole/>

²³¹ <http://dps.alaska.gov/AWT/>

²³² https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf

²³³ https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/EM211.pdf

²³⁴ <http://www.nmfs.noaa.gov/ole/>

²³⁵ <http://www.pacificarea.uscg.mil/Our-Organization/District-17/>

²³⁶ <http://dps.alaska.gov/AWT/>

²³⁷ <https://alaskafisheries.noaa.gov/fisheries-679regs>

²³⁸ http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html

²³⁹ <https://www.law.cornell.edu/cfr/text/50/600.740>

²⁴⁰ <https://www.uscg.mil>

²⁴¹ <http://www.pacificarea.uscg.mil/Our-Organization/District-17/>

effort (pers. comm. Stephen White).

The NPFMC Groundfish and Halibut Observer Program²⁴² (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.

An annual report is produced each year on the Alaskan observer program, which covers fisheries in the BSAI and GOA Regions²⁴³. From the 2016 observer program report, observer coverage in the BSAI cod fisheries by catcher/processors, and catcher vessels delivering to motherships was at 100%, for all 3 major gear types. For catcher vessels delivering shoreside in 2016, about 50% of Pacific cod caught by non-pelagic trawls was observed, and about 15% of Pacific cod taken by pots was observed. Coverage in the GOA Pacific cod fisheries by catcher/processors was at 100%, for the only two gears involved (longline and trawl). For catcher vessels in 2016, the observed percentages of cod catch were 7% in longline, 12% for pots, and 14% in trawls.

While observers are not directly part of the federal MCS programme 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 (pers. comm. Nathan Lagerwey - OLE).

The Alaska Department of Public Safety²⁴⁴, through its Division of Alaska Wildlife Troopers²⁴⁵ is primarily responsible for enforcing fish and wildlife-related statutes and regulations in Alaska. Some ADFG biologists and other staff have undertaken enforcement training and may participate in enforcement activities²⁴⁶ and assist the Wildlife Troopers as needed. The AWT attend the BOF and have an important input in the development of state regulations and legislation.

Evidence Basis:

The OLE publishes a national annual report²⁴⁷ and the Alaska region submits six monthly reports to the NPFMC. As an example, see OLE 2017²⁴⁸ - Report for the period 1st October 2016 – 31st March 2017: for all fisheries, there were: 51 written warnings, 238 summary settlements and 1 criminal case. While the report does not distinguish which fishery the offences related to, none involved the Pacific cod fishery (pers. comm. Nathan Lagerwey - OLE).

The USCG publishes an annual report to the NPFMC on resources applied to fishery enforcement in the previous year, the number of boardings/inspections, the number of violations, lives lost at sea, safety issues, and any changes in regulations. The most recent report April – May 2017 (See Enforcement Committee webpage²⁴⁹), indicates a low number of infractions: from a total of 93 boardings, all but one were related to safety equipment deficiencies, none were associated with the Pacific cod fishery.

The low occurrence of serious offences indicates that the Pacific cod fishery is generally compliant with regulations and the sanctions are considered to be an effective deterrent.

The NPMC have an Enforcement Committee²⁵⁰ charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea²⁵¹. 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.

²⁴² <https://alaskafisheries.noaa.gov/fisheries/observer-program>

²⁴³ <https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf>

²⁴⁴ <http://dps.alaska.gov>

²⁴⁵ <http://dps.alaska.gov/AWT/>

²⁴⁶ <http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main>

²⁴⁷ http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf

²⁴⁸ <https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C>

²⁴⁹ <https://www.npfmc.org/committees/enforcement-committee/>

²⁵⁰ <https://www.npfmc.org/committees/enforcement-committee/>

²⁵¹ https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
<p>The US Coast Guard https://www.uscg.mil</p> <p>NMFS Office of Law Enforcement http://www.nmfs.noaa.gov/ole/</p> <p>Alaska Wildlife Troopers http://dps.alaska.gov/AWT/</p> <p>Enforcement consideration for NOAA and NPFMC https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf</p> <p>Electronic Monitoring (EM) technologies https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/EM211.pdf</p> <p>17th District USCG http://www.pacificarea.uscg.mil/Our-Organization/District-17/</p> <p>Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679] https://alaskafisheries.noaa.gov/fisheries-679regs</p> <p>OLE in Alaska http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html</p> <p>MSA section (50 CFR 600.740²⁵²) "remedies for violations" https://www.law.cornell.edu/cfr/text/50/600.740</p> <p>The NPFMC Groundfish and Halibut Observer Program https://alaskafisheries.noaa.gov/fisheries/observer-program</p> <p>The Alaska Department of Public Safety http://dps.alaska.gov</p> <p>ADFG staff enforcement training http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main</p> <p>OLE national annual report http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf</p> <p>OLE Alaska region six monthly reports to the NPFMC https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C</p> <p>NPFMC Enforcement Committee https://www.npfmc.org/committees/enforcement-committee/</p> <p>NPFMC enforcement Committee Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf</p>				
Non-Conformance Number (if relevant):				

10.2 Fishing vessels shall not be allowed to operate on the resource in question without specific authorization.			
FAO CCRF (1995) 7.6.2 Other 8.1.2, 8.2.1			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
The local management body does not maintain an updated record of all authorization to fish, or vessels are permitted	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management	Fishing vessels are not allowed to operate on the resource in question without specific authorization.

²⁵² <https://www.law.cornell.edu/cfr/text/50/600.740>

to operate on the resource in question without specific authorization.	body maintain an insufficiently updated record of all authorization to fish.	body maintain a moderately updated record of all authorization to fish.	Fulfils all parameters.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	

Evaluation Parameters
Process: There is a mechanism or system established to maintain a record of fishing authorizations.
Current Status/Appropriateness/Effectiveness: This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data.

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

Process:
Every fishing vessel targeting Pacific cod in Alaska is required to have a federal or state permit. The Restricted Access Management Program (RAM) is responsible for managing NOAAs Alaska Region licence and permit programs. RAM responsibilities include: providing program information to the public, determining eligibility and issuing permits, processing transfers, collecting landing fees and related activities.

The Alaska Commercial Fisheries Entry Commission (CFEC) helps to conserve and maintain the economic health of Alaska’s commercial fisheries by limiting the number of participating fishers. CFEC issues permits and vessel licenses and provides due process hearings and appeals as and when needed.

Current Status/Appropriateness/Effectiveness:
OLE, USCG and AWT staff have on-line access to information related to permits and licences and are therefore able to confirm whether a vessel or individual has the correct credential to be operating in a fishery.

Evidence Basis:
Details of licence and permits for the federal and state fisheries are maintained and are accessible on-line^{253, 254}

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:
Details of licence and permits for the federal fisheries <https://alaskafisheries.noaa.gov/permits-licenses>
Details of licence and permits for the federal fisheries <http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main>

Non-Conformance Number (if relevant):

²⁵³ <https://alaskafisheries.noaa.gov/permits-licenses>
²⁵⁴ <http://www.adfg.alaska.gov/index.cfm?adfg=fishlicense.main>

Not Applicable			
10.3 States involved in the fishery shall, in accordance with international law, within the framework of sub-regional or regional fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their national jurisdiction.			
<i>FAO CCRF (1995) 8.1.4</i>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Within a regional framework involving other regional bodies, the local management body is not cooperating in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. Lacking in all parameters.	Within a regional framework involving other regional bodies, the local management body is cooperating insufficiently in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. Lacking in two parameters.	Within a regional framework involving other regional bodies, the local management body is cooperating moderately in establishing systems for monitoring, control and surveillance and enforcement of measures regulating fishing operations in waters outside their national jurisdiction. Lacking in one parameter.	States involved in the fishery do, in accordance with international law, within the framework of sub-regional or regional fisheries management organizations or arrangements, cooperate to establish systems for monitoring, control, surveillance and enforcement of applicable measures with respect to fishing operations and related activities in waters outside their national jurisdiction. Fulfils all parameters.
Evaluation Parameters Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone. Process: There is a mechanism or system established to conduct enforcement operations outside the country jurisdiction. Current Status/Appropriateness/Effectiveness: This mechanism is enforcing operations in internationally occurring fisheries. If the stock under consideration is not transboundary, then the Standard need only be concerned with the effectiveness and suitability of the monitoring, surveillance, control and enforcement activities at the national level for the fishery of which the Unit of Certification is a part. If the Unit of Certification is part of a national fleet fishing on a transboundary stock, then it is still likely to be the effectiveness and suitability of the monitoring, surveillance, control and enforcement activities at the national level shall be assessed. If the Unit of Certification covers all the fishing on the stock under consideration, then the monitoring, surveillance, control and enforcement all of the national fleets is of concern and shall be assessed (to ensure full consideration of total fishing mortality on the stock under consideration). Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include enforcement reports.			
Evaluation (per parameter)/: General description of evidence in order to score the clause Not applicable - the fishery does not occur outside the Alaska EEZ.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>
References:			
Non-Conformance Number (if relevant):			

Not Applicable

10.3.1 States which are members of or participants in sub-regional or regional fisheries management organizations or arrangements shall implement internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States shall also proceed, as necessary, to assist other States in achieving the objectives of the FAO CCRF (1995), and should make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State.

FAO CCRF (1995) 7.7.5/8.3.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>The State has not implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements.</p> <p>Lacking in all parameters.</p>	<p>The State has insufficiently implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements.</p> <p>Lacking in two parameters.</p>	<p>The State has moderately implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements.</p> <p>Lacking in one parameter.</p>	<p>The state which is members of or participants in sub-regional or regional fisheries management organizations or arrangements implements internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States also proceed, as necessary, to achieve and to assist other States in achieving the objectives of the FAO CCRF, and make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State.</p> <p>Fulfills all parameters.</p>

Evaluation Parameters				
Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.				
Process: There are regulations established against vessels flying the flag of non-members or non-participants country which may engage in activities which undermine the effectiveness of conservation and management measures established by regional bodies.				
Current Status/Appropriateness/Effectiveness: These measures are effective in deterring such practices.				
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include enforcement or other reports.				
Evaluation (per parameter)/: General description of evidence in order to score the clause				
Not applicable - the fishery does not occur outside the Alaska EEZ.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

Not Applicable			
10.4 Flag States shall ensure that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels shall carry on board the Certificate of Registry and their authorization to fish.			
<i>FAO CCRF (1995) 8.2.2</i>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
No Certificate of Registry has been issued to vessels.	An insufficient number of vessels have been issued the Certificate of Registry.	A moderate number of vessels have been issued the Certificate of Registry.	The flag State ensures that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels carry on board the Certificate of Registry and their authorization to fish.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters			
Not applicable if no foreign vessels fish in the State's EEZ, or if its vessels do not fish in high seas or in another State's EEZ.			
Process: There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.			
Current Status/Appropriateness/Effectiveness: These vessels have been issued with a Certificate of Registry and they are required to carry it on board.			

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.				
Evaluation (per parameter)/: General description of evidence in order to score the clause Not applicable for the Alaska Pacific cod fishery.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

Not 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.			
<i>FAO CCRF (1995) 8.2.3</i>			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Vessels have not been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.	An insufficient number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.	A moderate number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels.	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.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.
Evaluation Parameters			
Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.			
Process: There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.			
Current Status/Appropriateness/Effectiveness: Foreign vessels authorized to fish in the State's EEZ or its vessels fishing in another State's EEZ have been marked accordingly to international guidelines.			
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.			
Evaluation (per parameter)/: General description of evidence in order to score the clause			

Not Applicable - vessel owners must demonstrate citizenship and relevant vessel registration documents.				
Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input type="checkbox"/>
References:				
Non-Conformance Number (if relevant):				

11. There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations. **FAO CCRF (1995) 7.7.2/8.2.7**

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

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
National laws of adequate severity are not in place that provide for effective sanctions. Lacking in all parameters.	National laws of adequate severity are in place but insufficient to provide for effective sanctions. Lacking in two parameters.	National laws of adequate severity are in place but considered moderate in providing for effective sanctions. Lacking in one parameter.	National laws of adequate severity are in place that provide for effective sanctions. Fulfils all parameters.

Evaluation Parameters
Process: The system of national laws is of adequate severity to provide for effective sanctions.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that national laws are of adequate severity to provide for effective sanctions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process / Current Status/Appropriateness/Effectiveness / Evidence Basis:

The MSA provides four options for penalizing violations. In ascending order of severity:

- 1) Issuance of a citation (a type of warning), usually at the scene of the offence (see 15 CFR part 904, subpart E²⁵⁵).
- 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 proceedings²⁵⁶. The low proportion of violations encountered during at-sea patrols

²⁵⁵ <https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E>

²⁵⁶ <https://fisheries.msc.org/en/fisheries/alaska-pollock-bering-sea-and-aleutian-islands/@assessments>

of the Alaska fisheries demonstrates effective deterrence (Jun-Sep 2016: 403 boardings; 7 violations; 1.7% violation rate) (17th Coast Guard District Enforcement Report – B4 USCG Report, October 2016).

Alaska state law, universal citation 16.05.723²⁵⁷, describes the penalties for violating a BOF regulation. Fines, up to a maximum of \$15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanour conviction within a 10 year period will result in a fine 3 times the value of any fish in possession or a fine of \$10,000, whichever is greater. The option of pursuing criminal action is also available to the state. No recent sanctions have been applied in the state Pacific cod fishery and ADFG staff consider that sanctions are effective deterrents (pers. comm Forest Bower, ADFG).

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

MSA 15CFR PART 904 Subpart E <https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E>

MSC BSAI Public Certification report <https://fisheries.msc.org/en/fisheries/alaska-pacific-cod-bering-sea-and-aleutian-islands/@assessments>

Alaska state law, universal citation 16.05.723

<http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723><http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723>

Non-Conformance Number (if relevant):

11.2 Sanctions applicable in respect of violations and illegal activities shall be adequate in severity to be effective in securing compliance and discouraging violations wherever they occur. Sanctions shall also be in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures.

FAO CCRF (1995) 7.7.2/8.1.9/8.2.7

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Sanctions considered effective in severity to deter violators are not in force. Lacking in all parameters.	Sanctions are in force but insufficiently effective to affect authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures. Lacking in two parameters.	Sanctions are in force but moderately effective to affect authorization to fish and/or to serve as masters or officers of a fishing vessel, in the event of non-compliance with conservation and management measures. Lacking in one parameter.	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. Fulfils all parameters.

²⁵⁷ <http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723><http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723>



<p>Evaluation Parameters</p> <p>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.</p> <p>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.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.</p>				
<p>Evaluation (per parameter)/: General description of evidence in order to score the clause</p>				
<p>Process / current Status / Appropriateness / effectiveness</p> <p>The parameters in clause 11.1 show that, with the limited violations the sanctions imposed for violations acts a deterrent.</p>				
<p>Evidence Basis</p> <p>NOAA Alaska region has available a "Summary Settlement and Fix-it Schedule"²⁵⁸ 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.</p> <p>Alaska state law, universal citation 16.05.723²⁵⁹, describes the penalties for violating a BOF regulation. Fines, up to a maximum of \$15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanour conviction within a 10 year period will result in a fine 3 times the value of any fish in possession or a fine of \$10,000, whichever is greater. The option of pursuing criminal action is also available to the state.</p>				
<p>Conclusion:</p>				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
<p>References:</p> <p>NOAA Alaska region, Summary Settlement and Fix-it Schedule, http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf</p> <p>NOAA Office of General Counsel – Penalty Policy and Schedule http://www.gc.noaa.gov/enforce-office3.html</p> <p>Alaska State Law – Fisheries Penalties http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723</p>				
<p>Non-Conformance Number (if relevant):</p>				

²⁵⁸ http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf
²⁵⁹ <http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723><http://law.justia.com/codes/alaska/2015/title-16/chapter-16.05/article-04/section-16.05.723>

Not Applicable			
11.3 Flag States shall take enforcement measures in respect of fishing vessels entitled to fly their flag which have been found by them to have contravened applicable conservation and management measures, including, where appropriate, making the contravention of such measures an offence under national legislation.			
FAO CCRF (1995) 8.2.7			
Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no enforcement measures for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures.	There are insufficiently effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures.	There are moderately effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures.	Flag States take enforcement measures with fishing vessels entitled to fly their flag if the vessels have been found by the State to have contravened applicable conservation and management measures. These enforcement measures will include, where appropriate, making the contravention of such measures an offence under national legislation.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.
Evaluation Parameters			
Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.			
Process: If applicable, the system of enforcement measures is effective for foreign vessels fishing in the State's EEZ or for its vessels fishing in high seas or in another State's EEZ.			
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate enforcement action in these cases i.e., boarding, violations.			
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or enforcements reports.			
Evaluation (per parameter)/: General description of evidence in order to score the clause			
Not applicable, no foreign vessel is licenced to fish within the Alaska EEZ, US licenced vessels do not fish on the high seas or in another State's EEZ for Pacific cod.			
Conclusion:			
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
None <input checked="" type="checkbox"/>			
References:			
Non-Conformance Number (if relevant):			

5.6 F. Serious Impacts of the Fishery on the Ecosystem

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

FAO CCRF (1995) 7.2.3/8.4.7/8.4.8/12.11

FAO ECO (2009) 29.3/31

FAO Eco (2011) 41-41.4

12.1 States shall assess the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and assess the relationship among the populations in the ecosystem.

FAO CCRF (1995) 7.2.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no assessment of the impacts of environmental factors on target stocks and associated species in the same ecosystems.	There is insufficient assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species.	There is moderate assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species.	The State assesses the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and the relationship among the populations in the ecosystem.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is a process that allows for the assessment and monitoring of environmental factors (e.g. climatic, oceanographic) on target stocks and associated species in the same ecosystem, and to assess the relationships between species in the ecosystem.

Current Status/Appropriateness/Effectiveness: There is evidence that assessments have been conducted to determine the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. The results of these studies are in sufficient detail to allow informed management of the fishery.

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

Evaluation:

The National Oceanic and Atmospheric Administration (NOAA, of which NMFS is a part) has a series of programmes monitoring and modelling oceanographic processes in Alaskan and adjoining waters. This data, together with a range of other environmental monitoring information such as plankton, low trophic level fish species, fish populations and population dynamics of higher predators are all assembled through NMFS. The relationship between environmental factors (biotic and abiotic) and BSAI, AI and GoA groundfish is evaluated annually in the Stock Assessment and Fishery Evaluation process. All significant and commercial species are assessed individually according to the SAFE Tier system applied, including key prey and predators, notably cod, pollock and arrowtooth flounder. The ecosystem considerations section of the SAFE report includes area-specific indicators of the ecosystem health (Eastern Bering Sea, Western, Central and Eastern Aleutians and Gulf of Alaska). The SAFE assessment also includes a consideration of the status of Essential Fish Habitat (EFH).

The relationships among populations in the ecosystem has been extensively examined through a variety of ecosystem and multi-species models, notably the Forage Euphausiid Abundance in Space and Time (FEAST), concentrated on climate/forage fish/zooplankton interactions with specific

applications for cod, pollock and also fur seals, chinook salmon, birds. 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, 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.

Process: The SAFE evaluations provide a process by which a wide range of environmental information relevant to cod, pollock and associated groundfish species is assembled and evaluated in relation to its potential effects. In addition, the relationship between different populations in the ecosystem is evaluated through ongoing ecosystem and multi-species modelling programmes within NMFS. These information sources are presented and considered annually at the Plan Team, SSC and NPFMC meetings.

Current Status/Appropriateness/Effectiveness: There is clear evidence that relatively in-depth studies (especially considering the extent of the area under consideration) have been conducted on the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. Not only are a wide range of parameters monitored, but these are then synthesised into a readily understood form; from systems ecologists to stock assessment scientists and from the SAFE process to managers at NPFMC. NPFMC managers also require information from ecosystem modelling as part of the management process.

Evidence Basis: There is a significant evidence base including annual stock assessment reports, results of modelling output (the majority of which are published in peer-reviewed scientific journals) and reports of Council meetings, all of which are publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

Zador 2016c; Zador 2016b; Zador 2016a; Holsman et al 2016; NMFS 2016a; NMFS 2016b; NPFMC 2017; Aydin 2017

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.2.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no assessment and corrections where appropriate, of adverse environmental impacts on the resources from human activities. Most or all of the potential impacts listed in the evaluation parameters are not considered.	There is insufficient assessment and corrections, where appropriate, of adverse environmental impacts on the resources from human activities. Many of the potential impacts listed in the evaluation	There is moderate assessment and corrections where appropriate, of adverse environmental impacts on the resources from human activities. Some of the potential impacts listed in the evaluation	Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected. All potential impacts listed in the evaluation parameters are considered.

Lacking in all parameters.	parameters are not considered. Lacking in two parameters.	parameters are not considered. Lacking in one parameter.	Fulfils all parameters.
<p>Evaluation Parameters</p> <p>Process: There is a process that allows for the assessment of environmental impacts and their minimization or correction.</p> <p>Current Status/Appropriateness/Effectiveness: There is evidence of appropriate assessments made to elucidate the impacts environmental impacts on the resources from human activities. Human impacts include both fishing and non-fishing activities. Examples may include overfishing of the target stock, significant bycatch of associated species, gear-habitat interactions, and where relevant, mining, dredging, pollution, introduction of exotic species, and conversion of important aquatic habitats.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.</p>			
<p>Evaluation:</p> <p>Adverse environmental effects on fish resources from fishery-related activities are evaluated through a Programmatic Supplemental Environmental Impact Statement (PSEIS). The Alaska Groundfish Fisheries Programmatic Supplemental Environmental Impact Statement (2004 PSEIS; NMFS 2004) evaluated the cumulative changes in the management of the groundfish fisheries since the implementation of the Fishery Management Plan for the Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) and the Fishery Management Plan for the Groundfish of the Gulf of Alaska (GOA FMP) and considered a broad array of policy-level programmatic alternatives. On the basis of the analysis, the 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 see whether changes are warranted. The Council also reviewed factors that may influence the timing for supplementing or updating the 2004 PSEIS. The National Environmental Policy Act (NEPA) requires agencies to prepare a supplemental EIS (SEIS) to either draft or final EISs if the agency (1) makes substantial changes in the proposed action that are relevant to environmental concerns; or (2) there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. An SEIS is required if the new information is sufficient to show a proposed or remaining action will affect the quality of the human environment in a significant manner or to a significant extent not already considered. In April 2014, the Council evaluated whether the triggers for supplementing the PSEIS have been met, and concluded both that a supplemental EIS was not required, and also 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.</p> <p>Adverse effects from other human activities would be subject to evaluation according to NEPA. NMFS, NPFMC and ADFG would all be consulted under statute if a major project were planned which could affect the resource.</p> <p>The PSEIS and other EIS's required under NEPA would necessarily consider all potential impacts on the resources.</p> <p>Process: 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 EIS's by the relevant organisations for non-fishery related effects, in which NMFS, NPFMC and ADFG would be consulted, as appropriate.</p> <p>Current Status/Appropriateness/Effectiveness: There is clear evidence that appropriate assessments have been carried out, and reviewed for fishery-related effects (notably the 2004 PSEIS and 2014 review). Recent examples are also available (e.g. in Arctic) of EIS of non-fishing activities and their effects on resources.</p> <p>Evidence Basis: The PSEIS, review documents and other EIS of non-fishing activities are readily available, notably through the NMFS website.</p>			

Conclusion:				
Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: Oil and Gas EIS http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm ; NMFS 2015;				
Non-Conformance Number (if relevant):				

12.3 The most probable adverse impacts of the fishery on the ecosystem/environment shall be considered, taking into account available scientific information, and local knowledge. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence shall be necessary to ascertain the adequacy of mitigation measures.
FAO Eco (2009) 30.4, 31, 31.4
FAO Eco (2011) 41.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no accounting of most probable adverse impacts of the fishery on the ecosystem/environment . Few or no probable impacts are considered. There is no use of generic evidence on the ecosystem impact of fishing for the unit of certification. Lacking in all parameters.	There is insufficient accounting of most probable adverse impacts of the fishery on the ecosystem/environment. Many probable impacts are not considered. There is insufficient availability or use of generic evidence on the ecosystem impact of fishing for the unit of certification. Lacking in two parameters.	There is moderate accounting of most probable adverse impacts of the fishery on the ecosystem/environment. Some probable impacts are not considered. There is moderate availability or use of generic evidence on the ecosystem impact of fishing for the unit of certification. Lacking in one parameter.	The most probable adverse impacts of the fishery on the ecosystem/environment are considered, taking into account available scientific information, and local knowledge. In the absence of specific information on the ecosystem impacts of fishing for the unit of certification, generic evidence based on similar fishery situations can be used for fisheries with low risk of severe adverse impact. However, the greater the risk the more specific evidence is necessary to ascertain the adequacy of mitigation measures. Fulfils all parameters.

Evaluation Parameters
Process: There is specific information on the ecosystem impacts of fishing for the unit of certification present. Also, there is a mechanism in place by which the most probable adverse impacts of the fishery on the ecosystem and environment are assessed using the best available scientific knowledge (which may include traditional knowledge where this is verifiable), and management objectives aimed at avoiding these impact are developed.
Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter. All probable negative impacts are considered. Such impacts may include significant impacts on non-

target fishery resources (including discards), gear-habitat interactions, endangered, threatened, protected (ETP) species interactions, and food web interactions. If information has been utilized from generic evidence based on similar fishery situations, based on the risk of severe adverse impact, the information shall be of higher precision for higher risk. For example, keystone species or species with relative low growth rates, high catchability, or fisheries with significant ETP, bycatch of non-target fishery resources (or non-target stocks or species or harvests or discards), or with important concerns for gear-habitat interactions can be considered high risk. If information specific to the unit of certification area is available, generic evidence based on similar fishery situations may not be necessary.

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

Evaluation:

Given the depth of analysis available, it seems that all appreciable potential adverse impacts of the fishery on the ecosystem have been considered. Through scientific investigations of NMFS, the PSEIS provides a comprehensive evaluation of the Fishery Management Plans; the SAFE process evaluates the status of groundfish (and other major species) on an annual basis including consideration of major bycatches, effects on prohibited species (i.e. species which cannot be landed and which have 'caps' in place to limit total catches in a fishery sector, these are notably halibut and salmon – chinook and chum), habitat and a wide-ranging consideration of ecosystem indicators; these are supported by extensive monitoring programmes, and specific investigation of issues of concern (such as Essential Fish Habitat impacts, reductions in fur seal populations, Stellar sea lion feeding resources, impacts on seabirds). The NPFMC and Alaska Board of Fisheries (BoF) both have wide ranging representation from the wider stakeholder community (as described previously). In addition, assessment Plan Team meetings, NPFMC and BoF meetings are all open to attendance by a wide range of stakeholders. 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.

Process: Significant specific information is collected on all appreciable adverse effects of the fishery on the ecosystem – using both specific scientific studies and views and information provided by the wider stakeholder community. These are assessed through a specific Environmental Impact evaluation (PSEIS) and routinely through the SAFE, Council and BoF processes. Management objectives have been developed in response to these processes: the PSEIS process led to the Council adopting 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.

Current Status/Appropriateness/Effectiveness: Management measures are in place, based on a sound and fishery-related evidence platform and extensive evaluations, designed to achieve the stated objectives for relevant ecosystem components. These specifically include marine mammals, seabirds, prohibited species, target species and bycatch species, essential fish habitat, Habitat Areas of Particular Concern and food-web effects. As such information and objectives are specific to the Unit of Certification and/or fishery management system, use of more generic information is not considered necessary.

Evidence Basis: There is an extensive evidence base setting out the evaluation of potential adverse effects of the fishery, the management objectives related to these, the measures in place to achieve the objectives and ongoing monitoring of the effectiveness of these measures. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Aydin 2017; Muto et al 2015; NMFS 2010; NMFS 2014; NMFS 2015; NMFS 2016a; NMFS 2016b; NMFS 2017b; NPFMC 2016b; NPFMC 2017; Oliver 2017; USFWS 2015

Non-Conformance Number (if relevant):

12.4 Impacts that are likely to have serious consequences shall be addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.

*FAO Eco (2009) 29.3, 29.4, 31
FAO Eco (2011) 41*

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no addressing of significant impacts employing an immediate management response or a further analysis of the identified risk.</p> <p>Lacking in all parameters.</p>	<p>Impacts that are likely to have serious consequences are insufficiently addressed employing an immediate management response or a further analysis of the identified risk.</p> <p>Lacking in two parameters.</p>	<p>Impacts that are likely to have serious consequences are moderately addressed employing an immediate management response or a further analysis of the identified risk.</p> <p>Lacking in one parameter.</p>	<p>Impacts that are likely to have serious consequences are addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There is a process that allows for impacts that are likely to have serious consequences to be addressed.

Current Status/Appropriateness/Effectiveness: If there are impacts likely to have serious consequences, there is evidence available to support the use of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.

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

Evaluation:

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 Stock Assessment And Fishery Evaluation (SAFE) report. Following scientific assessment by the assessment authors, NMFS plan teams, information and recommendations are made to the SSC and NPFMC. 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 U.S. Fish and Wildlife Service (USFWS) to review potential impacts (generally indirect effects through changes in prey availability) on endangered species (through the Endangered Species Act) and marine mammals (Marine Mammal Protection Act). Assessments of the effects of the Alaska groundfish fisheries on many Endangered species are also provided in the Alaska Groundfish Harvest Specifications Environmental Impact Statement.

There are also requirements for the relevant agency (NMFS or U.S. Fish and Wildlife Service - USFWS) to evaluate (provide a Biological Opinion) on the effects of the Fishery Management Plans (FMP) for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) groundfish fisheries and the State of Alaska parallel groundfish fisheries on endangered species. The BiOp process has been followed, as required for short-tailed albatross and Steller sea lions 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 – for example pollock TACs in the EBS were adjusted partially to take account of potential indirect effects on northern fur seal; similar mechanisms can be applied to cod management.
3. Measures are in place to minimise bycatch and discarding (see Clause 12.5), including specific requirements and management/operational responses relating to prohibited species (notably chinook salmon and halibut)
4. Measures have been implemented to minimise direct effects on endangered species and prohibited species (such as bird deterrents on cod longline vessels to reduce mortality of, among others, short-toed albatross; salmon escapement devices on pollock trawls) and to minimise indirect effects (such as closure of essential habitat surrounding Steller sea lion rookeries.
5. Measures are in place to protect essential fish habitat (where relevant) and Habitat Areas of Particular Concern (HAPC). Several HAPCs are designated in the GoA, EBS and AI.

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

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 Marine Mammal Protection Act, 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 NPFMC consideration of ecosystem indicators, one of which is fur seal pup success. Specific research is also currently underway on factors influencing demography, as outlined in the Northern Fur Seal 2007 Conservation Plan, including studies on habitat-use, physical environmental data, selection of appropriate environmental indices of fur seal success, environmental effects on behaviour and productivity, inclusion of NFS in ecosystem modelling and oceanographic and fishery surveys based on pelagic fur seal habitat use.

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 BiOps. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NMFS 2016a; NMFS 2016b; NMFS 2017a; NMFS 2017b; NPFMC 2016a; NPFMC 2017; Oliver 2017; USFWS 2015; NMFS 2015

Non-Conformance Number (if relevant):

12.5 Appropriate measures shall be applied to minimize:

- catch, waste and discards of non-target species (both fish and non-fish species).
- impacts on associated, dependent or endangered species

FAO CCRF (1995) 7.6.9
FAO Eco (2009) 31.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There is no application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species.</p> <p>Lacking in all parameters.</p>	<p>There is insufficient application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species.</p> <p>Lacking in two parameters.</p>	<p>There is moderate application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species.</p> <p>Lacking in one parameter.</p>	<p>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.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There is a mechanism by which management measures are developed to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent and ETP species. This system shall include the development of specific management objectives.

Current Status/Appropriateness/Effectiveness: There are measures in place to minimize catch, waste, and discards of non-target species (both fish and non-fish species). These measures are considered effective at achieving the specific management objectives described in the process parameter.

There are measures in place to minimize impacts on associated, dependent, or endangered species. These measures are considered effective at achieving the specific management objectives described in the process parameter.

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

Evaluation:

The principal mechanism for directing measures to minimise catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species is the FMP (for the BSAI and for the GoA). The plans specify:

1. Minimum retention requirements - all vessels in the groundfish fisheries are required to retain all catch of pollock, cod and (in GoA) shallow water flatfish when directed fishing for those species is open
2. When directed fishing for pollock, 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, 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

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 (although much less relevant to the cod fisheries) red king crab, tanner crab and herring in the BSAI and GoA. As an example, bycatch caps are in place for halibut and salmon; time-area closures have been implemented and industry is encouraged to limit catches through gear modifications (such as halibut excluders in trawl gear) and monitoring of catches with rolling closures of bycatch 'hot-spots'. Bycatch limits for halibut have been decreased by 15% between 2014-16; these are apportioned by sector and season. To meet these reduced limits, deck-sorting of halibut is undertaken, with concomitant tagging studies of survivorship.

Process: 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 minimised. The extent and efficacy of these measures will concomitantly limit any impact of the fishery on associated, dependent and endangered species.

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 minimise impacts on associated, dependent, or endangered species; notably the Prohibited Species requirements will also directly affect chinook salmon (which may be from endangered stocks), 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 NPFMC.

Evidence Basis: There is an extensive evidence including FMPs, in-season catch reporting, endangered species conservation plans. These are all publicly available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

<https://www.federalregister.gov/articles/2016/06/10/2016-13697/fisheries-of-the-exclusive-economic-zone-off-alaska-bycatch-management-in-the-bering-sea-pollock>
 NMFS 2016a; NPFMC 2017; Oliver 2017; Zador 2016a; Zador 2016b; Zador 2016c

Non-Conformance Number (if relevant):

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

FAO ECO (2011) 41

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no management objectives that seek to	There are insufficiently effective management	There are moderately effective management	There are effective management objectives that seek to ensure that

<p>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.</p> <p>Lacking in all parameters.</p>	<p>objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.</p> <p>Lacking in two parameters.</p>	<p>objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.</p> <p>Lacking in one parameter.</p>	<p>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.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters

Process: There is a process in place that allows for the creation of management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. A note on data collections. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important inter alia because its capacity for supporting reliable assessment of current status and trends declines as it gets older. The requirements for data collection are focussed on the effects of the unit of certification on endangered species.

Current Status/Appropriateness/Effectiveness: There is evidence of effective management objectives in place in the fishery under assessment (e.g. in a fishery management plan) that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation:

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 12.12 below.

Process: The processes in place address designation of species and development of objectives and measures under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) for species of note - Steller sea lions and northern fur seals; short toed albatross and a number of salmon stocks. Clause 4.2 sets out the basis of the observer programme and the levels of precision available. This forms the basis of data collection directly relevant to the groundfish fisheries under assessment. This programme 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 programme 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 eastern Bering Sea, Aleutian Islands and Gulf of Alaska as appropriate. Marine mammals, and notably Steller sea lions and northern fur seal are monitored according to requirements within the Marine Mammal Protection Act (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 US Fish and Wildlife Service compiles data collected for seabirds at breeding colonies throughout Alaska (which may also feed into ecosystem monitoring used in the SAFE process).

Salmon are monitored through assessments carried out by relevant departments of Fish and Game (notably the Alaska Department of Fish and Game). Within the ground fish fisheries, coded-wire tag (CWT) recoveries are used to determine sources of fish taken in bycatches: more recent observer sampling protocols implemented in 2011 are expected to improve estimates of the stock of origin (from both CWT 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 U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species.
- Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.
- Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
- Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

NMFS annually categorizes all U.S. commercial fisheries under the Marine Mammal Protection Act (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 $\leq 1\%$ 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 $\geq 10\%$ of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammal resulting in annual mortality $\geq 50\%$ of PRB. 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 Potential Biological Removals (PBR) for, in particular Steller sea lions and northern fur seal indicates that interaction with the pollock 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 (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated 100,286 square kilometres as critical habitat for Steller sea lions in the Aleutian Islands 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 US Fish and Wildlife Service 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 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 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 (Shannon Fitzgerald pers. comm.). 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 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 pollock 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. A number of management actions were implemented by NPFMC to promote the recovery of Steller sea lions, including the restriction of pollock trawling within areas of critical habitat - 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 the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area. Recent surveys indicate that in the GOA pups and non-pups have increased at average rates of from 2-4% and 2-5% per year, giving a sustained increase in population size.

For seabirds, there are no records of Short-tailed albatross having been taken in the GOA Pacific cod fishery. Also as with the BSAI fishery, a recent 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). The limits appear unlikely to be exceeded, but measures such as closed areas of high bycatch (monitored through the SEASTATE system) are in place to minimise this bycatch.

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

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NPFMC 2016a; NPFMC 2017; USFWS 2015; Ford 2011

Non-Conformance Number (if relevant):

12.6 Non target catches, including discards, of stocks other than the "stock under consideration" shall be monitored and shall not threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action shall be taken.

FAO Eco (2009) 31.1
FAO Eco (2011) 41.1

Low Confidence Rating	Medium Confidence Rating	Medium Confidence Rating	High Confidence Rating
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(Critical NC)	(Major NC)	(Minor NC)	(Full Conformance)
<p>Non-target catches, including discards, of stocks other than the "stock under consideration" are not monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are not taken. Lacking in all parameters.</p>	<p>Non-target catches, including discards, of stocks other than the "stock under consideration" are insufficiently monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are insufficiently taken. Lacking in two parameters.</p>	<p>Non-target catches, including discards, of stocks other than the "stock under consideration" are moderately monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are moderately taken. Lacking in one parameter.</p>	<p>Non-target catches, including discards, of stocks other than the "stock under consideration" are monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise, effective remedial action are taken. Fulfils all parameters.</p>

Evaluation Parameters

Process: There is a system to monitor non-target catches and discards of stocks other than the stock under consideration, and to determine the likelihood that these catches and discards represent a significant risk to the affected species. The assessment of risks shall support the achievement of appropriate management objectives for bycatch species.

Current Status/Appropriateness/Effectiveness: If catches endanger these stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible serious risk of extinction, effective remedial action is taken by the management organization. Examples of irreversible or very slowly reversible effects on bycatch species include excessive depletion of very long-lived organisms. To mitigate effects that are likely to be irreversible or very slowly reversible requires those effects to be made less severe such that they are no longer likely to be irreversible or very slowly reversible. Examples of management measures may include incidental take allowances, bycatch caps, prohibited retention, safe release practices, or use of bycatch reduction devices or practices. Remedial action shall be considered effective if it reduces the impact of the fishery on non-target species to the point where there is no longer a risk of extinction.

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

Evaluation:

Monitoring of non-target catches and discards is provided by NMFS-certified Fishery Observers deployed to vessels and on floating or shoreside processing plants and industry reports of catch and production. The NMFS Alaska Regional Office Catch Accounting System (CAS) then produces estimates of bycatches with near real-time delivery of accurate groundfish and prohibited species catch and bycatch

Information. This information is used for in-season management decisions. The observer programme has been described in detail under Clause 4.2. While the percentage observer coverage may vary with sectors, the programme does address all areas of impact of the fleet, including non-target catches of groundfish, prohibited species (chinook and chum salmon and halibut), endangered species, other fish and invertebrate species and discards of all of these.

These data provided through the observer programme are then specifically used in the stock assessment process for all groundfish and prohibited species. None of these species is at serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Catches of endangered species are evaluated in relation to acceptable levels of impact, which may be tested through statutory biological opinion (BiOp) analyses; management measures are then demonstrably implemented (such as in the case of Steller sea lions, northern fur seal, chinook salmon and short-toed albatross, see Clause 12.5.1).

Process: The observer programme and catch reporting system provide a system to monitor non-target catches and discards. Monitoring of trends through existing or developing stock assessments (of groundfish, sculpins, unidentified sharks, salmon sharks, dogfish, sleeper sharks, skates, octopus, squid, species in the non-specified group –giant grenadier, other grenadiers - and forage fish) or ecosystem monitoring covering other groups determine the likelihood that these catches and discards represent a significant risk to the affected species. Where risks are identified, such as avoidance of significant impact to endangered species and avoidance of prohibited species, the near real-time catch accounting system allows for the achievement of appropriate management objectives.

Current Status/Appropriateness/Effectiveness: For the majority of species, catches do not pose a risk of overfishing. For those species for which risk of extinction or other impacts that are likely to be irreversible or very slowly reversible is a threat – endangered species and prohibited species - effective actions to limit catches have been implemented. These measures include incidental take allowances (for ESA-listed endangered species and prohibited species), no retention of prohibited species (chinook and chum salmon, halibut and red king crab and Tanner crabs), safe release practices (notably for halibut) and the use of bycatch reduction devices or practices such as streamer lines to reduce seabird bycatch and trawl modification to allow salmon escapement. Other measures such as avoidance of critical habitat (for Steller sea lions, red king crab and Tanner crab and fur seal have also been implemented. The sum of such remedial actions is considered effective in avoiding the risk of extinction of any non-target stocks through fishery-related impacts.

Evidence Basis: Details of the observer programme, monitoring results and aggregated catch information, together with ecosystem evaluations, stock assessments, FMPs, protected species management plans and biological opinion reviews, are all widely available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References: NPFMC 2016a; NPFMC 2017; Oliver 2017; Muto et al 2015; NMFS 2010; NMFS 2014; USFWS 2015

Non-Conformance Number (if relevant):

12.7 The role of the “stock under consideration” in the food web shall be considered, and if it is a key prey species in the ecosystem, management objectives and measures shall be in place to avoid severe adverse impacts on dependent predators.

*FAO Eco (2009) 31.2
FAO Eco (2011) 41.2*

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no consideration of the role of the “stock under consideration” in the food web, especially if it is a key prey species in the ecosystem, to avoid severe adverse impacts on dependent predators.	There is insufficient consideration of the role of the “stock under consideration” in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators.	There is moderate consideration of the role of the “stock under consideration” in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators.	The role of the “stock under consideration” in the food web is considered, and for a key prey species in the ecosystem, with objectives and management measures are in place to avoid severe adverse impacts on dependent predators. Fulfils all parameters.

Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	
<p>Evaluation Parameters</p> <p>Process: There is a mechanism in place by which the role of the stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined. If the species is considered by the relevant scientific authority to be an important prey species, there shall be specific management objectives relating to minimizing the impacts of the fishery on dependent predators. The FAO Guidelines require that all sources of fishing mortality on the stock under consideration are taken into account (whether or not it is a prey species) in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches and catches in other fisheries.</p> <p>Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the management objectives described in the process parameter, and there is evidence to demonstrate that they are successful to this end. If the species under assessment is not considered to be a key prey species, then this parameter shall be considered fulfilled.</p> <p>Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.</p>			
<p>Evaluation:</p> <p>The role of the stock in the food web is specifically considered in both 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 thenceforth considered through the Plan Team, SSC and NPFMC deliberations. These indicators include physical conditions, prey and predator indicators, such as mesozooplankton, copepod size, capelin populations, apex fish biomass and Steller sea lions/northern fur seal success.</p> <p>In addition, ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST), concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock and also fur seals, chinook salmon, birds. Food web modelling using Ecosim/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, 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.</p> <p>Process: 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 stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined and evaluated. As pollock is a prey species for endangered species (Steller sea lions and fur seal), there are specific management objectives in place relating to minimizing the impacts of the fishery on dependent predators, these are set out more fully in clause 12.12. It is noted that through catch reporting and observer monitoring of all fleets, all sources of fishing mortality on the stock under consideration are taken into account in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches and catches in other fisheries.</p> <p>Current Status/Appropriateness/Effectiveness: The development of ecosystem indicators and models, and the incorporation of these into the stock assessment, Plan Team, SSC and NPFMC evaluation process allow for the ongoing development of management measures to achieve the management objectives. These may include precautionary adjustments of TACs and designation of essential habitat for mammalian predators.</p> <p>Evidence Basis: The ecosystem indicators and other ecosystem modelling information used in the SAFE assessments, endangered species management plans and the outcomes of SSC and NPFMC evaluations etc are all freely available on the NMFS and NPFMC websites.</p>			
<p>Conclusion:</p>			

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>
References: Aydin 2017; NMFS 2010; NPFMC 2016a; NPFMC 2017; Zador 2016a; Zador 2016b; Zador 2016c				
Non-Conformance Number (if relevant):				

12.8 States shall introduce and enforce laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).
FAO CCRF (1995) 8.7.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).	There is insufficiently effective introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).	There is moderately effective introduction and enforcement of laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).	The State has introduced and enforces laws and regulations based on the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78). Fulfils all parameters.
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	

Evaluation Parameters

Process: The appropriate regulations have been implemented.

Current Status/Appropriateness/Effectiveness: These regulations and their enforcement are effective and in line with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating there to (MARPOL 73/78).

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

Evaluation:

The US has enacted the Act to Prevent Pollution from Ships of 1980, this implements the provisions of MARPOL annexes to which the US 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 US Coast Guard.

Specifically, all fishing vessels operating in federal waters are required to comply with MARPOL Annex V, which specifically prohibits the at-sea disposal of all plastics. Vessels operating in the North Pacific therefore have 3 options: 1) non-plastics can be disposed of at sea within the legal restrictions, 2) they can incinerate wastes onboard the vessel, or 3) they can hold the wastes for shoreside disposal at port. Vessels are required to post oil pollution and garbage placards, and to have a written solid waste management plan that describes procedures for collecting, processing, storing, and discharging garbage, and the 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.

Process: Relevant laws and accompanying regulation to implement MARPOL 73/78 have been introduced through Federal legislation and Agencies.

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 freely available to view. The Coast Guard and Observer programmes have each been reviewed elsewhere in the standard and both are considered to be effective in enforcing regulations.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

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.
<https://www.gpo.gov/fdsys/pkg/CFR-2001-title33-vol2/xml/CFR-2001-title33-vol2-part151.xml>
<https://www.gpo.gov/fdsys/pkg/CFR-2012-title33-vol2/xml/CFR-2012-title33-vol2-part155.xml>

Non-Conformance Number (if relevant):

12.9 There shall be knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved shall be avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat shall be considered, not just that part of the spatial range that is potentially affected by fishing.
FAO Eco (2009) 31.3
FAO Eco (2011) 41.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There is no knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. Lacking in all parameters.	There is an insufficient knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. Lacking in two parameters.	There is a moderate knowledge basis for avoidance, minimization or mitigation of impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved or for consideration of the full spatial range of relevant habitat. Lacking in one parameter.	There is knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved are avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat are considered, not just that part of the spatial range that is potentially affected by fishing. Fulfils all parameters.

Evaluation Parameters

Process: There is a mechanism in place by which the potential impacts of the fishery upon habitats essential to the stock under consideration and on habitats that are highly vulnerable to damage are identified. This or a similar mechanism shall also be in place to identify habitats which are highly vulnerable to fishery activities by the Unit of Certification. The information provided by these mechanisms shall be used to produce specific management objectives related to avoiding significant negative impacts on habitats. The knowledge of the habitats in question can therefore include relevant traditional, fisher or community knowledge, provided its validity can be objectively verified (i.e. the knowledge has been collected and analysed through a systematic, objective and well-designed process, and is not just hearsay). When identifying highly vulnerable habitats, their value to ETP species shall be considered, with habitats essential to ETP species being categorized accordingly.

Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

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

Evaluation

The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to 'prevent, mitigate or minimise, to the extent practicable' any adverse effects of fishing on EFH that are 'more than minimal and not temporary'. Councils are also required to give special attention to Habitat Areas of Particular Concern (HAPC). Each NPFMC FMP contains provisions for a review of EFH issues every 5 years. The latest review was carried out in 2015.

As part of the 2015 review, EFH 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 EFH 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 considers firstly whether the stock is above the Minimum Stock Size Threshold (MSST), defined as $\frac{1}{2}$ Bmsy. Mitigation measures would be recommended for any stock below MSST if reductions in EFH are identified as a cause of stock depletion. The next criterion is whether 'core EFH area' (CEA) is reduced for each species and life stage (CEA is generally taken as the 50% quantile threshold of suitable habitat). If >10% of the CEA is impacted, further analyses are required by stock assessment authors to determine whether there is a significant correlation with life history parameters for the stock to determine any plausible stock effects. Any plausible effects would be investigated by Plan Teams and SSC; if more than minimal and not temporary, these would result in mitigation measures being recommended to Council. This would result in the Council following its FMP amendment process to mitigate adverse effects.

HAPC's are sub-sites with important ecological functions or are especially vulnerable to human impacts. HAPCs are identified to Council, or by Council, according to set priorities (coral beds, seamounts, skate habitat).

Process: There is a well-defined process in place to model the extent of EFH for each major species, including pollock and cod, and to evaluate, according to set criteria, the effects of fishing. Where such effects may be appreciable, a process to evaluate and mitigate is in place within the NPFMC. An alternative process is in place to identify priority HAPC and to evaluate and protect these. These processes specifically include the effects of pollock and cod-directed fisheries (and for all gear types). 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 is used to inform the model.

Habitat essential to endangered species is identified according to regulatory requirements (Endangered Species Act and Marine Mammal Protection Act). NMFS has designated 100,286 square kilometers as critical habitat for Steller sea lions in the Aleutian Islands.

For Pacific cod, this includes 52 percent of critical habitat in the Aleutian Islands to Pacific cod fishing with trawl gear and 22 percent of critical habitat for hook-and-line, pot, and jig, and prohibits directed fishing for Pacific cod in waters from 0 nm to 3 nm from rookeries and from 0 nm to 10 nm from Buldir Island for hook-and-line and pot gear vessels. For pollock, this means closing 65 percent

of critical habitat in the Aleutian Islands to pollock fishing, including 0 nm to 20 nm from rookeries and haulouts.

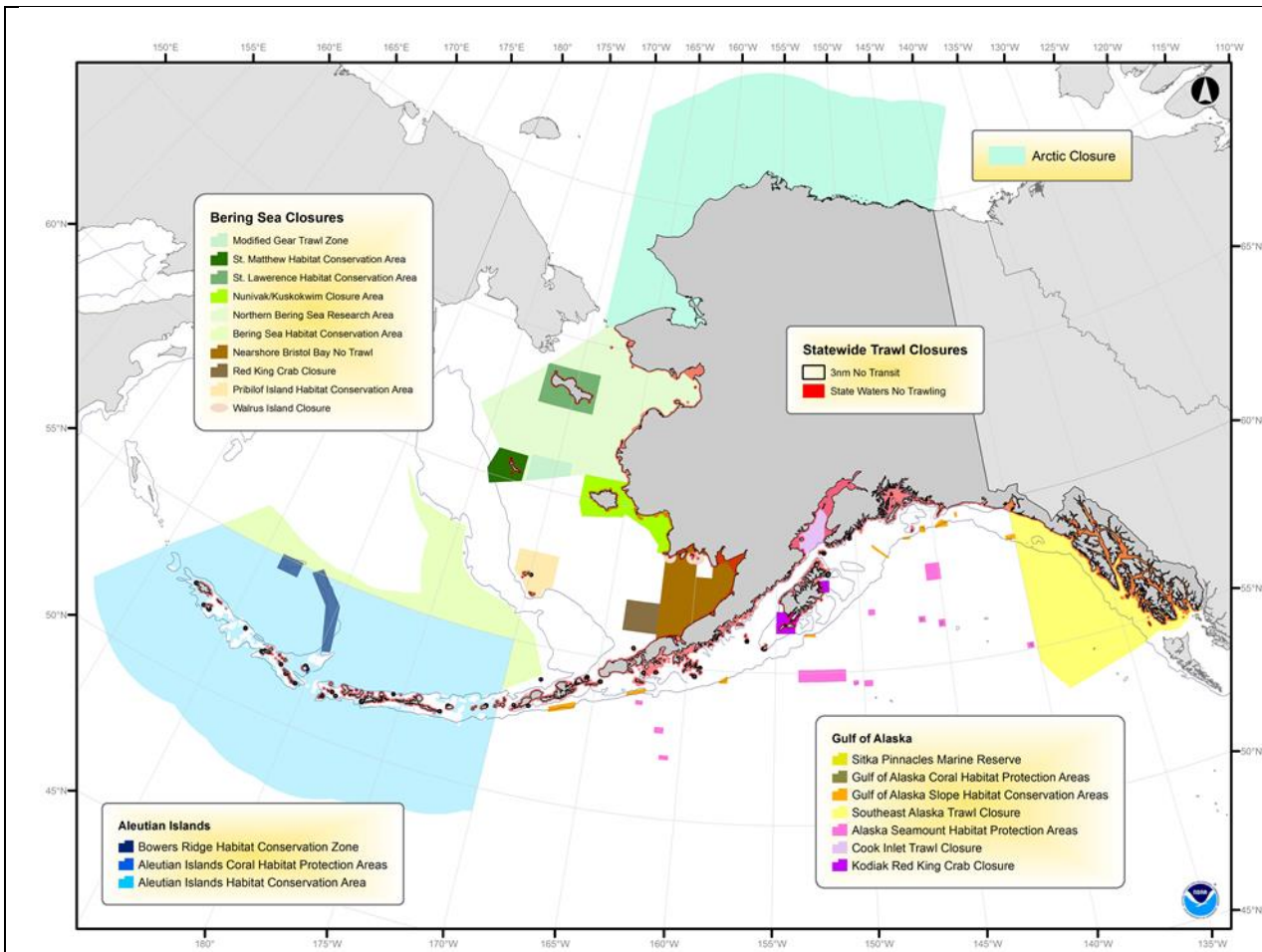
Current Status/Appropriateness/Effectiveness:

For EBS cod, the stock is above the MSST. The reduction in Pacific cod habitat during the period January 2003 – November 2016 averaged 4.9%, with a range of 3.6% – 6.0%. The most recent value (3.6%) is equal to the minimum for the time series. It has therefore been concluded that less than 10% of the CEA is affected by commercial fishing.

In the Aleutian Islands, cod is managed under Tier 5 of the FMP harvest control rules, and so MSST is undefined. However, the reduction in Pacific cod habitat during the period January 2003 – November 2016 averaged 1.9%, with a range of 1.2% – 2.7%. The most recent value (1.4%) is close to the minimum for the time series. It has therefore been concluded that less than 10% of the CEA is affected by commercial fishing.

In the GoA, the 2016 cod stock assessment estimated female spawning biomass to be above B35% (for Tier 3 stocks, the MSY level is defined as B35%). Therefore, GOA Pacific cod is above its MSST. Fishing impacts on GOA Pacific cod are generally very low (<2% habitat reduction). Although the overall picture is one of low impact on habitat, there are small localized areas of higher habitat reduction (>25%) corresponding to fishing grounds surrounding Kodiak Island and in the Shumagin Islands. The most intense loss of habitat appears to be the fishing grounds found in Barnabus and Chiniak gullies and a longer but less intense stretch in the southern and central Shelikof Strait. Smaller areas of habitat reduction can be found in patches throughout the western GOA. However, overall impacts in the GOA Pacific cod CEA are very low. The average percent habitat reduction for the GOA as a whole for the time period between January 2003 and September 2016 was 1.8%, with a maximum of 2.2% in April and May 2010. The percent reduction has remained relatively stable for the entire time period with a CV of 0.13 and has below 2% since January 2013. The 10% threshold for additional analyses was therefore not reached, and no further analysis was conducted

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 below shows HAPC and other habitat closures in Alaskan waters (Source: NMFS)



Evidence Basis: Fishery Management Plans, 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”, potential fishery impacts on them and on habitats that are highly vulnerable to damage by the fishing gear. Information and reports are all freely available on the NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

Thompson et al 2016, Barbeau et al 2016; NMFS 2016a; NMFS 2016b; NMFS 2017b; NPFMC 2016b

Non-Conformance Number (if relevant):

12.10 Research shall be promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities.
FAO CCRF (1995) 8.4.8/ 7.6.4

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
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<p>Research is not promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities.</p> <p>Lacking in all parameters.</p>	<p>Insufficient research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities.</p> <p>Lacking in two parameters.</p>	<p>Moderate levels of research are promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities.</p> <p>Lacking in one parameter.</p>	<p>Research is promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities.</p> <p>Fulfils all parameters.</p>
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Evaluation Parameters
Process: Research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities, as applicable to the fishery.
Current Status/Appropriateness/Effectiveness: There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various regulations, data and reports.

Evaluation
The NPFMC overarching policy includes the objective of applying judicious and responsible fisheries management practices, based on sound scientific research and analysis. Also, all management measures are to be based on the best scientific information available.

Key to delivering this scientific evidence base is the work of the Alaska Fisheries Science Centre (AFSC). The AFSC has a 3-5 year strategic research plan based on three themes:

1. Monitor and assess fish, crab, and marine mammal populations, fisheries, marine ecosystems, and the associated communities that rely on these resources.
2. Understand and forecast effects of climate change on marine ecosystems.
3. Achieve organizational excellence in our administrative activities through innovation and the use of best practices.

Specific research elements relevant to this clause are:

1. Support fishery management through providing core research products used in annual management decisions.
 - Maintain the current assessment tier of fish, crab, and marine mammal stocks
 - Support NOAA Fisheries and North Pacific Fishery Management Council analyses and international obligations
 - Create next generation fish, crab, and marine mammal stock assessments and biological and socioeconomic data collections
 - Conduct bycatch analyses and support conservation engineering advances
2. Understand and forecast effects of climate change on marine ecosystems
 - Finalize and implement the Regional Action Plan for Climate Science Strategy in the Southeast Bering Sea
 - Develop and implement Regional Action Plans for the Gulf of Alaska and the Aleutian Islands by 2017 and 2019, respectively
 - Conduct integrated ecosystem assessments
 - Implement NOAA Fisheries' components of NOAA's Arctic Action Plan
 - Forecast direct and indirect effects of climate change on fish, crab, and marine mammal species, their habitats, and the associated communities which rely on these resources
3. Achieve organizational excellence in our administrative activities through innovation and the use of best practices.
 - Develop annual resource allocation plans for AFSC based on criteria applied through the AFSC Science Planning and Implementation process. Coordinate result with the Alaska Regional Office (AKR), NOAA Fisheries Headquarters, and the North Pacific Fishery Management Council (NPFMC).
 - Implement annual AFSC staffing plans for FY2017-2022 which aim to achieve a constant, targeted cost of federal labour.
 - Incorporate Data Management Plans into each and every science project. Disseminate environmental data and metadata in a manner consistent with the NOAA Plan for Increasing Public Access to Research Results

It is also noted that research is often promoted and encouraged by academic institutions which furthers the aim of the NPFMC, such as the involvement of Alaska Pacific University (Brad Harris) in the essential fish habitat review work. Research continues into community development associated with fisheries, for example through Amendment 80 cooperatives. Industry is also regularly involved in research, such as into means of minimising salmon bycatch in trawl gear – a response to NPFMC objectives for prohibited species.

Process: Research is promoted, notably by the NPFMC, on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. This is directly applicable to the groundfish fishery.

Current Status/Appropriateness/Effectiveness: There is evidence for this research through the research plans of the AFSC but also work carried out by Universities and Industry that is of relevance to the fishery (such as through the EFH review). The information being collected is considered directly appropriate for overall fisheries management purposes.

Evidence Basis: NPFMC objectives and AFSC, other NMFS and NOAA research plans and outputs and work of academic institutions is widely available through respective websites. Research is of high quality and applicability.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>
			None <input checked="" type="checkbox"/>

References:

AFSC 2017; Amendment 80 cooperatives (<https://www.npfmc.org/amendment-80-cooperatives>); NPFMC 2017 NPFMC 2016b

Non-Conformance Number (if relevant):

12.11 There shall be outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).

FAO ECO (2011) 41.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are not outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).	There are insufficiently effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).	There are moderately effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).	There are effective outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).
Lacking in all parameters.	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.

Evaluation Parameters

Process: There is a process to set outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).

Current Status/Appropriateness/Effectiveness: There is evidence of outcome indicator(s) consistent with achieving management objectives for non-target stocks (i.e. avoiding overfishing and other impacts that are likely to be irreversible or very slowly reversible).

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management, stock and ecosystems assessment reports.

Evaluation
 Assessments are carried out (at some level of the NMFS Tier 1-5 assessment process) on all significant non-target fish and invertebrate stocks. Protected species are considered separately. Estimated Overfishing Levels and Acceptable Biological Catch (ABC) levels for these complexes are reviewed annually. Management Plans have been developed for each species or species complex.

Process: The process of setting overfishing levels and ABCs is as described for the target stock. 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. No species or complex is being fished beyond the overfishing level. Prohibited species (notably chinook salmon and halibut) are also subject to bycatch caps to help avoid overfishing. It is also noted that environmental monitoring and modelling allows the effects of wider environmental influences to be considered in the setting of indicator levels.

Evidence Basis: Assessments, FMPs and minutes of SSC and Council meetings and Plan Team responses are all widely available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>	High <input checked="" type="checkbox"/>	
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: NPFMC 2016a; NPFMC 2017; Oliver 2017

Non-Conformance Number (if relevant):

12.12 There shall be outcome indicator(s) consistent with achieving management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

FAO ECO (2011) 41

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including	There are insufficiently effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture	There are moderately effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or	There are effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other

recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Lacking in all parameters.	or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Lacking in two parameters.	enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Lacking in one parameter.	impacts that are likely to be irreversible or very slowly reversible. Fulfils all parameters.
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Evaluation Parameters
Process: There is a process in place that allows for the creation of effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.
Current Status/Appropriateness/Effectiveness: There is evidence for established outcome indicators (e.g. in a fishery management plan or other regulation) that seek to ensure that endangered species are protected (through state or federal regulations) from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Management objectives shall be achieved accordingly.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation
The basis of protection of endangered species is the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA). The endangered species inhabiting the BSAI and GOA are primarily under the responsibility of the US Fish and Wildlife Service (FWS) for seabird species and NMFS for other protected species (with respect to the groundfish fisheries, this is primarily marine mammals and some chinook salmon populations).
The FMPs specifically address, among all other issues, endangered species; this goes through the development and review processes described earlier. The groundfish FMP management policy specifically includes for cooperation with U.S. Fish and Wildlife Service (USFWS) to protect ESA-listed species, and if appropriate and practicable, other seabird species; to maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions; to encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate; to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species; 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. 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 (NOAA 2007).
The ESA requires the relevant agency (NMFS or U.S. Fish and Wildlife Service - USFWS) to evaluate (provide a Biological Opinion - BiOp) on the effects of the Fishery Management Plans (FMP) for the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BSAI) 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 BiOp process has been followed, as required for short-tailed albatross and Steller sea lions in relation to the groundfish fisheries.
The MMPA allows for NMFS to issue permits for the taking of marine mammals designated as depleted because of their listing under the ESA after the agency has determined that:
(1) the incidental M/SI from commercial fisheries will have a negligible impact on the affected species or stock;

(2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and

(3) Where required under section 118 of the MMPA, a monitoring program has been established, vessels engaged in such fisheries are registered in accordance with section 118 of the MMPA, and a take reduction plan has been developed or is being developed for such species or stock.

In relation to the MMPA, 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 $\leq 1\%$ 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 $\geq 10\%$ of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammals resulting in annual mortality $\geq 50\%$ of PRB. No Alaska groundfish fisheries, including Pacific cod or pollock are included in Category I. The BSAI Pacific cod longline fishery is Category II, all other cod and pollock directed fisheries category III (<http://www.nmfs.noaa.gov/pr/interactions/lof/final2014.htm>).

Process: 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 Potential Biological Removal (PBR) levels for marine mammals under the MMPA.

Current Status/Appropriateness/Effectiveness: Endangered species which may reasonably be expected to interact with the unit of certification are (BSAI Cod) Steller sea lions and northern fur seals; short toed albatross (other ESA seabirds, spectacled eiders and Steller's eiders are not considered in the BiOp to be relevant to the groundfish fisheries); and a number of salmon stocks.

Steller sea lion. The western U. S. stock of Steller sea lion (*Eumetopias jubatus*) is currently listed as "endangered" under the ESA, and designated as "depleted" under the MMPA. A number of management actions have been implemented to promote the recovery of the western U. S. stock of Steller sea lions; regulations changed the temporal and spatial distribution of the pollock and cod fisheries such as the establishment of critical habitat included 3 nm no-entry zones around rookeries, prohibition of groundfish trawling in proximity of certain rookeries, and three special aquatic foraging areas in Alaska; the Shelikof Strait area, the Bogoslof area, and the Seguam Pass area.

Northern fur seals. The Pribilof Island population of the Eastern Pacific stock of Northern fur seals was designated as "depleted" under the Marine Mammal Protection Act (MMPA) in 1988 because it had declined by more than 50% since the 1950s. A Conservation Plan has been developed for Northern fur seals (NMFS 2007): fur seals are estimated to consume little Pacific cod and therefore the Pacific cod fishery in the BSAI would be expected to have little impact on the food available to this species.

Seabirds. The US Fish and Wildlife Service 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. Limits for seabird mortality are established by NMFS. The 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 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 (Shannon Fitzgerald pers. comm.). Research is ongoing into cryptic mortality, particularly with third and fourth wire strikes of birds.

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. About 90% of the Chinook salmon bycatch is taken in the pollock fishery. Coded-wire tag recoveries from salmon bycatch in the BSAI pollock fishery between 1984 and 2010 revealed that few wild Chinook from the lower Columbia or upper Willamette rivers are taken by the pollock fishery and presumably in other groundfish fisheries that take far fewer salmon. Available data suggest that

salmon bycatch in the pollock fisheries do not pose a threat to ESA-listed salmon ESUs in the Pacific Northwest, and so the same will be true for cod-directed fisheries. Salmon are subject to Prohibited Species measures as described in Clause 12.6.

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NMFS 2015; NPFMC 2016a; NPFMC 2017; Oliver 2017; USFWS 2015

Non-Conformance Number (if relevant):

12.13 There shall be outcome indicator(s) consistent with achieving management objectives for avoiding, minimizing or mitigating the impacts of the unit of certification on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

FAO ECO (2011) 41.3

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. Lacking in all parameters.	There are insufficiently effective outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. Lacking in two parameters.	There are moderately effective outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. Lacking in one parameter.	There are effective outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification. Fulfils all parameters.

Evaluation Parameters

Process: There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives for avoidance, minimization or mitigation of impacts on essential habitats for the "stock under consideration" and on habitats that are highly vulnerable to damage by the fishing gear of the unit of certification.

Current Status/Appropriateness/Effectiveness: There are outcome indicators and management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

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

Evaluation

The Magnuson-Stevens Act requires Councils to identify essential fish habitat (EFH) for all fisheries and to 'prevent, mitigate or minimise, to the extent practicable' any adverse effects of fishing on EFH that are 'more than minimal and not temporary'. Councils are also required to give special attention to Habitat Areas of Particular Concern (HAPC). There is also a requirement for a 5-yearly review of methods to evaluate effects on EFH.

The latest review of Essential Fish Habitat issues has developed a hierarchical impact assessment methodology to operationalise the 'more than minimal and not temporary' criterion. This is based on the model of EFH impact and recovery outlined earlier. Stock assessment authors are required to determine whether the population under assessment is above or below 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.

Habitat areas of particular concern (HAPC) are designated following a nomination process according to NPFMC priorities. HAPC nominations are generally on a 5-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.

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

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

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

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References:

NPFMC 2016a; NPFMC 2017; NMFS 2016a; NMFS 2016b; NMFS 2017b

Non-Conformance Number (if relevant):

12.14 There shall be outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.

FAO ECO (2011) 41.2

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
<p>There are no outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.</p> <p>Lacking in all parameters.</p>	<p>There are insufficiently effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.</p> <p>Lacking in two parameters.</p>	<p>There are moderately effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.</p> <p>Lacking in one parameter.</p>	<p>There are effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species.</p> <p>Fulfils all parameters.</p>

Evaluation Parameters

Process: There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. Mortality in Alaska is usually accounted for all removals of given species. The State and federal fish accounting systems operate in depth and make an explicit effort to document all removals, to confirm with regulations in force. The assessors shall ensure that all removals are accounted in the system (fish ticket, eLanding) for stock assessment and management purposes.

Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicators and management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

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

Evaluation

At a fundamental level, the SAFE assessment process provides single-species stock assessments for all target groundfish species in the BS, AI and GoA. These stock assessments are informed by extremely accurate catch and discard data through state and federal online catch reporting, fish tickets, electronic landing and observer data. The SAFE process provides ABCs and overfishing limits, which in turn are considered by the SSC and NPFMC in setting TACs for each species.

TAC-setting within the NPFMC demonstrably follows the precautionary principle. This is also informed by the range of ecosystem indicators reported to the plan teams as part of the SAFE process; these indicators include mammalian predators of groundfish – notably Northern fur seal pup production for St. Paul Island in the EBS, Western Aleutian Island Seller sea lion non-pup counts and Western Gulf of Alaska Steller sea lion non-pup counts. These provide indices of mammalian predators of groundfish (pollock and cod) which are considered by the stock assessment plan teams, SSC and NPFMC in setting TACs. For mammalian predators of groundfish, outcome indicators of direct mortality are required by the MMPA and ESA in terms of allowable mortalities.

It is also noted that ecosystem and multi-species modelling is progressing, notably with ECOPATH and ECOSIM models of trophic linkages and carbon budgets allowing identification of predators of cod and pollock and the CEATTLE model, combining predation between cod, pollock and arrowtooth flounder inter and intraspecies predation with climatic effects. The latter aims to develop reference points in relation to prevailing climatic conditions, and multi-species ABCs.

Process: The mechanisms in place through the catch reporting, observer programme and in-season catch accounting systems ensure that all removals are accounted. These data are then incorporated into the SAFE process, providing ABCs and overfishing limits; and then into the SSC and NPFMC review process in setting stock TACs. These processes also include for ecosystem indicators, including mammalian and fish apex predators. The monitoring and management of fisheries in relation to marine mammal predators of cod and pollock 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 as part of the fishery management process – these being required by NPFMC.

Current Status/Appropriateness/Effectiveness: There is evidence from ABCs and overfishing limits for groundfish; precautionary TACs, which include ecosystem indicators; marine mammal mortality, habitat and trophic management measures that outcome indicators and management measures are in place which 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 being included in the SAFE assessments (the CEATTLE model was presented as an annex to the 2016 SAFE assessment).

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Aydin 2017; Holsman et al 2016; NMFS 2017a; NPFMC 2016b; NPFMC 2017; Zador 2016a; Zador 2016b; Zador 2016c

Non-Conformance Number (if relevant):

12.15 There shall be outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration must be reversible and not cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

FAO ECO (2011) 36.9, 41

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
There are no outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly	There are insufficiently effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are	There are moderately effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems	There are effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any

<p>reversible. Any modifications to the habitat for enhancing the stock under consideration are not reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function. Lacking in all parameters.</p>	<p>likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are insufficiently reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function. Lacking in two parameters.</p>	<p>that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are moderately reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function. Lacking in one parameter.</p>	<p>modifications to the habitat for enhancing the stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function. Fulfils all parameters.</p>
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Evaluation Parameters

Process: There is a process to allow for drafting effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. There is also a process to allow any modifications to the habitat for enhancing the stock under consideration and serious or irreversible harm to the natural ecosystem's structure, processes and function to be reversed.

Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

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

Evaluation

The preceding clauses have described the ecosystem management applied in the EBS, AI 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; 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.

There are also total 'Optimum Yield' limits set for all catches within both the BSAI FMP and GoA FMP. In the BSAI, the OY of the BSAI groundfish complex (consisting of stocks listed in the 'target species' category) is 85% of the historical estimate of MSY, or 1.4 to 2.0 million mt; it is noted that this limit is significantly below the sum of the ABCs for groundfish. In the GoA, The OY of the groundfish complex is in the range of 116,000 to 800,000 mt - the upper end of the range is derived from historical estimates of MSY. The caps imposed by OYs will therefore also set outcome indicators of total removals.

Habitats are also subject to ongoing monitoring and evaluation, by stock assessment authors, Plan Teams and also the SSC and NPFMC. Essential fish habitat and Habitat Areas of Particular Concern are subject to separate evaluation, designation, mitigation and monitoring.

Ecosystem modelling is relatively well developed, including the Forage Euphausiid Abundance in Space and Time (FEAST), concentrated on climate/forage fish/zooplankton interactions with specific applications for cod, pollock and also fur seals, chinook salmon, birds. 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, 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.

There are no enhancement activities associated with the groundfish fisheries, including no modifications to the habitat for enhancing the stock under consideration.

Process: The NPFMC approach to groundfish fisheries explicitly includes for ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. This includes the setting of outcome indicators relating to preserving the food web, managing incidental catch, avoidance of impacts on seabirds and mammals and reduce and avoid impacts to habitats.

Current Status/Appropriateness/Effectiveness: As outlined previously, objectives, indicators, management measures and ongoing monitoring and ecosystem modelling are all in place to meet the overarching objective of effective ecosystem-based management.

Evidence Basis: SAFE assessments (including ecosystem indicators and essential fish habitat evaluations) for each species are published annually, together with endangered species management plans, marine mammal monitoring and management measures. Developments in ecosystem modelling are published in the scientific press and NMFS website. All information is readily available through NMFS and NPFMC websites.

Conclusion:

Evidence Rating:	Low <input type="checkbox"/>	Medium <input type="checkbox"/>		High <input checked="" type="checkbox"/>
Non-Conformance:	Critical <input type="checkbox"/>	Major <input type="checkbox"/>	Minor <input type="checkbox"/>	None <input checked="" type="checkbox"/>

References: Aydin 2017; Holsman et al 2016; NMFS 2010; NPFMC 2016a; NMFS 2017b; Zador 2016a; Zador 2016b; Zador 2016c

Non-Conformance Number (if relevant):

5.7 References

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APPENDICES

Appendix 1 Stakeholder submissions

No stakeholder comments were received during announced consultation opportunities. Stakeholder input collected during on-site audit is presented throughout this assessment report and used during scoring (see Chapter 5).

Appendix 2 Peer Review

Peer Reviewer A Comments

Summary of Peer Reviewer Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes/No	Assessment Team Response
<p><u>Justification:</u> Yes. However, it is not completely clear how the stock configuration takes into account Russian potential impacts. The team states only this about Russia: <i>"The only other coastal state in the Bering Sea is Russia. Given the distance between the more populated regions of each country is vast, the need for a mechanism to allow for cooperation between neighbouring countries to improve coastal resource management is not applicable in this instance"</i>. I think that better and stronger justifications are needed in the framework of fundamental clauses 1, 2, 4 and 5. I suggest adding relevant sentences justifying that Russia is not involved at all.</p>		<p>The biological units are not considered to extend beyond the jurisdiction of the management organisations with the managed stocks being restricted to the Alaska EEZ. This is highlighted in sub clause 1.2 under the evaluation parameters "Current Status/Appropriateness".</p> <p>The sentence that has been highlighted by the reviewer has been taken from sub-clause 2.1.1 which refers to management of coastal area and their resources and not specifically the Pacific cod stock.</p>
<p><i>Do you think the non - conformance(s) raised are appropriate to achieve the high level of confidence, assigned to a given supporting clause, within the specified timeframe?</i></p>	Yes/No	Assessment Team Response
<p><u>Justification:</u></p>		
If applicable:		
<p><i>Do you think the client action plan is sufficient to close the non-conformances raised?</i></p>	Yes/No	Assessment Team Response
<p><u>Justification:</u></p>		

Table 2 Supporting clause review:

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.1	Yes	Yes	NA		
1.2	No	No	NA	The fact that the stock may spend a portion of its life in another country's jurisdiction (i.e., Russia) and may suffer mortality or other pressures is not considered at all in the rationale.	As stated in the rationale for 1.2, "The biological units are not considered to extend beyond the jurisdiction of the management organisations with the managed stocks being restricted to the Alaska EEZ."
1.2.1	Yes	Yes	NA		
1.3	No	No	NA	This clause is not assessed. However reading the text it is not clear if Russia is exploiting the stock or there is a lack of info about this.	The text says, "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." This sentence uses management terminology which indicates the stock are not 'shared stocks', i.e. they are not considered to cross into another coastal states EEZ
1.3.1	NA	NA	NA		
1.4	NA	NA	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.4.1	NA	NA	NA		
1.5	NA	NA	NA		
1.6	Yes	Yes	NA		
1.6.1	NA	NA	NA		
1.7	Yes	Yes	NA		
1.8	Yes	Yes	NA		
1.9	NA	NA	NA		
2.1	Yes	Yes	NA		
2.1.1	Yes	Yes	NA		
2.2	Yes	Yes	NA		
2.3	Yes	Yes	NA		
2.4	Yes	Yes	NA		
2.5	Yes	Yes	NA		
2.6	Yes	Yes	NA		
2.7	NA	NA	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
2.8	No	No	NA	Again the role of Russia here should be considered.	Additional text has been added, highlighting an agreement signed in 1989 between the US and Russia with respect to cooperation in combating oil pollution in the Bering and Chukci Seas.
3.1	Yes	Yes	NA		
3.2.1	Yes	Yes	NA		
3.2.2	Yes	Yes	NA		
3.2.3	Yes	Yes	NA		
3.2.4	Yes	Yes	NA		
3.2.5	Yes	Yes	NA		
3.2.6	Yes	Yes	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
4.1	No	No	NA	The impact of Russian fleet is not considered	There is no Russian fishery in the US EEZ. Consistent with Clause 1.2, the following text has been added to this clause, and to 4.1.2: The three SAFE reports explicitly state that P. 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 organisations with the managed stocks being restricted to the Alaska EEZ.
4.1.1	No	No	NA	The impact of Russian fleet is not considered	See previous clause 4.1 above.
4.1.2	No	No	NA	The impact of Russian fleet is not considered	See previous clause 4.1 above
4.2	Yes	Yes	NA		
4.3	Yes	Yes	NA		
4.4	Yes	Yes	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
4.5	Yes	Yes	NA		
4.6	Yes	Yes	NA		
4.7	Yes	Yes	NA		
4.8	Yes	Yes	NA		
4.9	NA	NA	NA		
4.10	NA	NA	NA		
4.11	NA	NA	NA		
5.1	Yes	Yes	NA		
5.1.1	Yes	Yes	NA		
5.1.2	No	No	NA	The impact of Russian fleet is not considered	There is no Russian fishery in the US EEZ. Consistent with Clause 1.2, and 4.1.x, the following text has been added to this clause: The three SAFE reports explicitly state that P. 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.

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
5.2	Yes	Yes	NA		
5.3	Yes	Yes	NA		
5.4	NA	NA	NA		
5.5	Yes	Yes	NA		
6.1	Yes	Yes	NA		
6.2	Yes	Yes	NA		
6.3	Yes	Yes	NA		
6.4	Yes	Yes	NA		
7.1	Yes	Yes	NA		
7.1.1	Yes	Yes	NA		
7.1.2	Yes	Yes	NA		
7.2	NA	NA	NA		
7.3	Yes	Yes	NA		
8.1	Yes	Yes	NA		
8.1.1	Yes	Yes	NA		
8.1.2	Yes	Yes	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
8.1.3	Yes	Yes	NA		
8.2	Yes	Yes	NA		
8.3	Yes	Yes	NA		
8.4	Yes	Yes	NA		
8.5	Yes	Yes	NA		
8.6	Yes	Yes	NA		
8.7	Yes	Yes	NA		
8.8	Yes	Yes	NA		
8.9	Yes	Yes	NA		
8.10	Yes	Yes	NA		
8.11	NA	NA	NA		
8.12	Yes	Yes	NA		
8.13	Yes	Yes	NA		
8.14	NA	NA	NA		
9.1	Yes	Yes	NA		
9.2	Yes	Yes	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
9.3	Yes	Yes	NA		
10.1	Yes	Yes	NA		
10.2	Yes	Yes	NA		
10.3	Yes	Yes	NA		
10.3.1	Yes	Yes	NA		
10.4	NA	NA	NA		
10.4.1	NA	NA	NA		
11.1	Yes	Yes	NA		
11.2	Yes	Yes	NA		
11.3	NA	NA	NA		
12.1	Yes	Yes	NA		
12.2	Yes	Yes	NA		
12.3	Yes	Yes	NA		
12.4	Yes	Yes	NA		
12.5	Yes	Yes	NA		
12.5.1	Yes	Yes	NA		

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
12.6	Yes	Yes	NA		
12.7	Yes	Yes	NA		
12.8	Yes	Yes	NA		
12.9	Yes	Yes	NA		
12.10	Yes	Yes	NA		
12.11	Yes	Yes	NA		
12.12	Yes	Yes	NA		
12.13	Yes	Yes	NA		
12.14	Yes	Yes	NA		
12.15	Yes	Yes	NA		

Peer Reviewer B Comments

Summary of Peer Reviewer Opinion

<i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i>	Yes	Assessment Team Response
<p><u>Justification:</u></p> <p>The assessment provides a comprehensive description of the fishery, its environmental impacts, and management regime, and a cogent rationale for most of the clauses of the standard which justifies its re-certification.</p> <p>I found that the rationale for some of the clauses was in some instances not relevant to the issue being examined, and have made comments to this effect for the relevant clauses. In nearly all of these cases the relevant information was cited elsewhere in the report.</p> <p>I have also made some “General Comments”. Of these, my only significant concern is associated with the evidence of potential impacts on bird species, and the management response. Both the evidence and management response seem to be sorely lacking. I would encourage action by the assessment team to investigate this issue further; and would encourage fishery managers and operators to monitor these interactions and implement mitigation measures with more rigour than the report suggests is currently the case.</p>		<p>With regard to seabirds, a full response is provided under ‘General Comments’ below (no supporting clauses were queried). However, the level of monitoring, impact assessment and mitigation/management response within the fishery provides a high level of confidence in full conformance with the standard, as outlined in the report.</p>

<i>Do you think the non - conformance(s) raised are appropriate to achieve the high level of confidence, assigned to a given supporting clause, within the specified timeframe?</i>	NA	Assessment Team Response
<p><u>Justification:</u></p> <p>No non-conformances have been raised.</p>		

If applicable:

<i>Do you think the client action plan is sufficient to close the non-conformances raised?</i>	Yes/No	Assessment Team Response
<p><u>Justification:</u></p> <p>Not applicable – no non-conformances have been raised.</p>		

Table 3 Supporting clause review:

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.1	No	No	NA	<p>Judging from the narrative section of the report (section 3.6.5), the scoring is justified.</p> <p>However the evaluation of "Current Status" does not provide sufficient evidence that the fishery "operates in compliance with the requirements of local, national and international laws & regulations etc."</p> <p>The rationale includes information about scientific research, stock and some ecosystem assessments, but insufficient information about "implementation of rules and regulations and enforcement activities".</p>	Additional text and evidence has been added to validate, "implementation of rules and regulations and enforcement activities".
1.2	Yes	Yes	NA	The evidence presented in the report indicates that the Pacific cod stock comprises several discrete sub-populations, and that there are	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				appropriate stock assessments and management measures in place for each management unit.	
1.2.1	Yes	Yes	NA	The information presented demonstrates that the management system takes account of previously agreed management measures.	
1.3	NA	NA	NA	On the basis of the information presented in the report it seems appropriate not to regard this as a transboundary, straddling of highly migratory stock and not to apply this clause.	
1.3.1	NA	NA	NA	See comments for clause 1.3.	
1.4	NA	NA	NA	See comments for clause 1.3.	
1.4.1	NA	NA	NA	See comments for clause 1.3.	
1.5	NA	NA	NA	See comments for clause 1.3.	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
1.6	Yes	Yes	NA	It is reported that costs of management are known and that actions have been taken to recover management costs (for instance for the observer programme). Although the evidence of cost recovery seems to be limited to partial funding of the observer programme, this does at least justify the score awarded.	
1.6.1	NA	NA	NA	The clause is not applicable because the fishery operates within the US EEZ.	
1.7	Yes	Yes	NA	The scoring is justified.	
1.8	Yes	Yes	Yes	The scoring is justified.	
1.9	NA	NA	NA	This clause is not applicable because this is not a high seas fishery.	
2.1	Yes	Yes	NA	The scoring is justified.	
2.1.1	Yes	Yes	NA	The scoring is justified.	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
2.2	Yes	Yes	NA	The scoring is justified.	
2.3	Yes	Yes	NA	The scoring is justified.	
2.4	Yes	Yes	NA	The scoring is justified.	
2.5	Yes	Yes	NA	The scoring is justified.	
2.6	Yes	Yes	NA	The scoring is justified.	
2.7	NA	NA	NA	NA	
2.8	Yes	Yes	NA	The scoring is justified.	
3.1	Yes	Yes	NA	The scoring is justified.	
3.2.1	Yes	Yes	NA	The scoring is justified.	
3.2.2	Yes	Yes	NA	The scoring is justified.	
3.2.3	Yes	Yes	NA	The scoring is justified.	
3.2.4	No	No	NA	The scoring is not justified. There seems to be evidence of bird bycatch issues in the cod freezer longline fishery. There is also (by	There is a considerable level of monitoring, assessment and mitigation/management interactions of the fishery with seabirds. Further information on all these is, of course, available in the literature cited. In

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				<p>inference) known to be an issue of bird strike on fishing warps.</p> <p>Given the knowledge about the incredibly detrimental impacts that longline bycatch and trawl warp strikes can have on seabird populations, the lack of information about the mortality rates and apparent absence of a concerted and precautionary management response is a significant shortcoming in the management of these fisheries.</p> <p>While the mortality of birds in longline fisheries is obvious when the lines are hauled, mortality of birds resulting from warp interactions are indeed "cryptic" and only detected by specifically monitoring this impact.</p> <p>As a precautionary measure the mandatory use of streamers / Tori</p>	<p>relation to the standard itself, the following clauses apply: 3.2.4, 3.2.6, 12.3, 12.4, 12.5, 12.5.1, 12.6, 12.7, 12.12, 12.15.</p> <p>In Clause 12.5.1 it is stated that that 'whilst most takes of Short-tailed albatross 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 (Shannon Fitzgerald pers. comm.). Research is ongoing into cryptic mortality, particularly with third and fourth wire strikes of birds'. This statement presumably raised the concern of the reviewer. We are familiar with the situations in the Southern Oceans to which the reviewer probably refers. However, the measures typically employed in these situations (dedicated</p>

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				lines would have been expected in any situation where there is a risk to such species as short-tailed albatross in the GOA.	observations, use of streamer lines) are already in place in the Alaskan fisheries where the analysis is going further into any potential interactions, and the significance of these. As detailed, the management system is demonstrably effective in responding to issues raised through such studies.
3.2.5	Yes	Yes	NA	The scoring is justified.	
3.2.6	Yes	Yes	NA	The scoring is justified.	
4.1	Yes	Yes	NA	The scoring is justified.	
4.1.1	Yes	Yes	NA	The scoring is justified.	
4.1.2	Yes	Yes	NA	Full conformance is justified by the quality and scale of the stock assessment information.	
4.2	Yes	Yes	NA	The scoring is justified.	
4.3	Yes	Yes	NA	The scoring is justified.	
4.4	Yes	Yes	NA	The scoring is justified.	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
4.5	Yes	Yes	NA	The scoring is justified.	
4.6	No	No	NA	The scoring rationale presented is not directly relevant to the clause, and should be revised. It should consider the Alaskan state policy commitments to increase Alaska Native Consultation (see clause 3.1).	Additional text has been added to address this point.
4.7	NA	NA	NA	The stocks under consideration seem to be limited in their extent to the US EEZ, so it is not appropriate to evaluate this clause.	As suggested, an explanatory sentence has been added to the text in each of Clauses 4.7 through 4.11.
4.8	NA	NA	NA	See response to clause 4.8.	
4.9	NA	NA	NA	Although this clause is clearly not applicable, some justification that there are no developing countries prosecuting the fishery would be appropriate.	
4.10	NA	NA	NA	Again, some	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				justification of why this clause is not applicable would seem appropriate.	
4.11	NA	NA	NA	Again, some justification of why this clause is not applicable would seem appropriate.	
5.1	Yes	Yes	NA	The scoring is justified.	
5.1.1	Yes	Yes	NA	Full conformance is justified by the quality and scale of the stock assessment information.	
5.1.2	Yes	Yes	NA	The scoring is justified.	
5.2	Yes	Yes	NA	The scoring is justified.	
5.3	No	No	NA	The scoring rationale exposes a gap in the information presented. First of all, what are the "stocks of mutual concern" that the US & Canada meet to discuss at the Technical Subcommittee of the Canada-US Groundfish	This has been addressed with a re-write of this section to include USA international involvement in PISCES. Also now points out that cooperation occurs with neighboring countries such as Canada on research on species of interest, such as P. cod, even though such stocks are not transboundary.

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				<p>Committee? Information should be presented to demonstrate that these don't include the cod stocks under consideration.</p> <p>Secondly, there is a reference here to <i>"...work with Russia on P. cod."</i></p> <p>Given the statements elsewhere in the report about the stock being limited to the US EEZ, the Canadian and Russian aspects of the P. cod stocks require some elaboration.</p>	<p>The TSC was set up between Canada and USA in 1960, prior to the EEZs being declared in the 1970's. Most of the discussions relevant to P. cod would now focus around general research topics of interest to both countries, given that P. cod is not a transboundary stock. Also, the various agencies are briefed on ongoing research in each jurisdiction. It is not crucial to include this info here, but it does demonstrate an aspect of international cooperation on relevant research.</p> <p>The partial sentence re work with Russia was an error, and has been replaced with sentence and reference on international scientific cooperation.</p>
5.4	Yes	Yes	NA	The scoring is appropriate (presuming that there are no transboundary stocks – see comments on clause 5.3 above).	This is confirmed.
5.5	Yes	Yes	NA	The scoring is	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				appropriate.	
6.1	Yes	Yes	NA	The scoring is appropriate. It would be nice to also see the method for calculating FABC as well.	The portion of the NPFMC/FMP table relevant to Tier 3 FABC calculation has been added.
6.2	No	No	NA	There is a problem here. Figure 3.3.4 shows the trajectory of the stock relative to F and B reference points for the EBS stock. For most of the time series, F has been above the limit reference point for exploitation. There is no evidence to show that <i>"actions are taken to decrease the fishing mortality..below that limit reference point"</i> . Although it would now seem that the EBS and GOA stocks are both being fished at a level below OFL and have a biomass above MSST, there is little in the	If the main points in the Evaluation Parameters for Clause 6.2 are examined, the P. cod fisheries are in full conformance. Using EBS P. cod as the example (as this was the stock singled out in the review): a) The stock under assessment is clearly not overfished based on the definition of overfished and the current stock status. The 2016 SAFE for EBS P. cod notes that "total catch has been less than OFL in every year since 1993." b) The stock has been above limit reference point (LRP) proxy, e.g. 1/2

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
				history of the fishery to demonstrate that action has been taken to reduce F when it was clearly necessary to do so.	<p>B35% and has avoided recruitment overfishing and other severe negative impacts on the stock.</p> <p>c) Current stock size is far above the LRP proxy, and is estimated by the 2016 stock assessment to be about 50% higher than the B35% reference point (Bmsy proxy). Biomass has increased steadily since 2009.</p> <p>d) There is a comprehensive harvest control rule strategy in place to ensure that fishing mortality is reduced if the LRP is approached, and that a rebuilding plan is implemented if the stock drops below the 1/2Bmsy (MSST) threshold. As P. cod is identified as a key prey species for Steller sea lions,</p>

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
					<p>the FMP also contains an additional rule to prohibit directed fishing if the spawning biomass of P. cod falls below the B20% threshold.</p> <p>e) Fishing mortality on EBS P. cod has generally declined since about 2009, and the current (2016) estimate (from the 2016 SAFE) report is the lowest since 2001. The stock in 2016 was well below FOFL, at the maxFABC level, and projected to be below maxFABC in 2017 and 2018.</p> <p>These points are summarized from material presented in various clauses, as well as in the stock assessment summary (Section 3.3) in the Background section of the report.</p>

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
6.3	Yes	Yes	NA	The scoring is appropriate.	
6.4	Yes	Yes	NA	The scoring is appropriate.	
7.1	Yes	Yes	NA	The scoring is appropriate.	
7.1.1	Yes	Yes	NA	The scoring is appropriate.	
7.1.2	Yes	Yes	NA	The scoring is appropriate.	
7.2	NA	NA	NA	NA	
7.3	No	No	NA	<p>The available evidence is that for the EBS stock at least, overfishing has been taking place under the current HCRs for most of the points in the time series (see Figure 3.3.4).</p> <p>The response can be, at best, described as "moderately effective", on the basis of its historical performance and a medium conformance rating would seem more appropriate.</p>	See comments on clause 6.2 above to address concerns with Fig. 3.3.4 and overfishing. For clause 7.3, there are a number of measures in place, and listed in the rationale, which would allow "appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the fishery resource". These include HCRs, the specified need under the MS Act for rebuilding plans when required, the SSL B20% rule, and the

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
					ability of authorities to apply in-season measures as necessary. Full conformance is met.
8.1	Yes	Yes	NA	The scoring is appropriate.	
8.1.1	Yes	Yes	NA	The scoring is appropriate.	
8.1.2	Yes	Yes	NA	The scoring is appropriate.	
8.1.3	Yes	Yes	NA	The scoring is appropriate.	
8.2	Yes	Yes	NA	The scoring is appropriate.	
8.3	Yes	Yes	NA	The scoring is appropriate.	
8.4	Yes	Yes	NA	The scoring is appropriate.	
8.5	Yes	Yes	NA	The scoring is appropriate.	
8.6	Yes	Yes	NA	The scoring is appropriate.	
8.7	Yes	Yes	NA	The scoring is appropriate.	
8.8	Yes	Yes	NA	The scoring is appropriate.	
8.9	Yes	Yes	NA	The scoring is appropriate.	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
8.10	Yes	Yes	NA	The scoring is appropriate.	
8.11	NA	NA	NA	This clause is not scored because no new gear has been introduced in the past 3 years.	Agreed – sentence added.
8.12	Yes	Yes	NA	The scoring is appropriate.	
8.13	Yes	Yes	NA	The scoring is appropriate.	
8.14	NA	NA	NA	NA	
9.1	Yes	Yes	NA	The scoring is appropriate.	
9.2	Yes	Yes	NA	The scoring is appropriate.	
9.3	Yes	Yes	NA	The scoring is appropriate. I am not sure that the system in place is "multi-faceted". Perhaps "comprehensive" might be a better description.	Agreed – text modified.
10.1	Yes	Yes	NA	The scoring is appropriate.	
10.2	Yes	Yes	NA	The scoring is appropriate.	
10.3	NA	NA	NA	NA	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
10.3.1	NA	NA	NA	NA	
10.4	NA	NA	NA	NA	
10.4.1	NA	NA	NA	NA	
11.1	Yes	Yes	NA	The scoring is appropriate.	
11.2	Yes	Yes	NA	The scoring is appropriate.	
11.3	NA	NA	NA	NA	
12.1	Yes	Yes	NA	The scoring is appropriate.	
12.2	Yes	Yes	NA	The scoring is appropriate.	
12.3	Yes	Yes	NA	The scoring is appropriate.	
12.4	Yes	Yes	NA	The scoring is appropriate.	
12.5	Yes	Yes	NA	The scoring is appropriate.	
12.5.1	Yes	Yes	NA	The scoring is appropriate.	
12.6	Yes	Yes	NA	The scoring is appropriate.	
12.7	Yes	Yes	NA	The scoring is appropriate.	
12.8	Yes	Yes	NA	The scoring is appropriate.	

Supporting clause	Has all available relevant information been used to score this clause? (Yes/No)	Does the information and/or rationale used to score this clause support the given confidence rating? (Yes/No)	Will the non-conformance(s) raised improve the fishery's performance to the high confidence level? (Yes/No/NA)	Justification Support given answers by referring to specific scoring clauses and any relevant documentation where applicable. Note: Justification is only required where answers given are 'No'.	Assessment Team Response
12.9	Yes	Yes	NA	The scoring is appropriate.	
12.10	Yes	Yes	NA	The scoring is appropriate.	
12.11	Yes	Yes	NA	The scoring is appropriate.	
12.12	Yes	Yes	NA	The scoring is appropriate.	
12.13	Yes	Yes	NA	The scoring is appropriate.	
12.14	Yes	Yes	NA	The scoring is appropriate.	
12.15	Yes	Yes	NA	The scoring is appropriate.	

General Comments

Acronyms - The report could be written with a little more sympathy for the reader – the text is very acronym-dense. Although there is a good glossary, it would be helpful if within each section / chapter . clause, the full text of each acronym is given when it is first used.

International relations – the text oscillates between a (probably correct) view that the stocks under consideration are confined in their extent and movements to the US EEZ and some hints at international collaboration with Canada and Russia about research into Pacific cod which are not fully explained. It would be helpful to clarify what these international arrangements are researching and whether (or not) they are relevant to the stocks under consideration.

Assessment team response:

Text has been added in the relevant/identified clauses to address this, and to make clear that the P. cod stocks under consideration here are not transboundary.

Bird impacts – the report mentions that there is a bird bycatch in one of the longline fisheries, and also alludes to bird impacts on wires (presumably trawl warps). There is a mention that “cryptic” bird mortality is being examined, but this is not explained further. It also seems that the level of commitment to (or requirement for) bird impact mitigation measures is rather lacking.

These are serious shortcomings in both this report and also the management of the fishery, particularly given that one of the bird species coincident with the fishery area is the short tailed albatross. There really should be much better information available about the level of bird interactions with the fishery, and also better information about the effectiveness and implementation of bird mitigation measures which should ideally form part of a binding operational procedure for fishing vessels.

There are many other longline fisheries in the world that require such mitigation measures in order to attain sustainability targets (notably in the Southern Oceans); and studies of similar trawl fisheries have revealed that an apparently minor concern about bird strikes on warps can pose a major risk to seabird populations. In all cases it has been found that once the problem has been identified and quantified, it is easy to address.

I would strongly encourage the assessment team to review this particular issue and the risks associated with it very thoroughly.

Assessment team response:

There is a considerable level of monitoring, assessment and mitigation/management of interactions of the fishery with seabirds. Further information on all these is, of course, available in the literature cited. In relation to the standard itself, the following clauses apply: 3.2.4, 3.2.6, 12.3, 12.4, 12.5, 12.5.1, 12.6, 12.7, 12.12, 12.15. In Clause 12.5.1 it is stated that that *‘whilst most takes of Short-tailed albatross 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 (Shannon Fitzgerald pers. comm.). Research is ongoing into cryptic mortality, particularly with third and fourth wire strikes of birds’*. This statement presumably raised the concern of the reviewer. We are familiar with the situations in the Southern Oceans to which the reviewer probably refers. However, the measures typically employed in these situations (dedicated observations, use of streamer lines) are already in place in the Alaskan fisheries where the analysis is going further into any potential interactions, and the significance of these. As detailed, the management system is demonstrably effective in responding to issues raised through such studies.



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