DNV·GL

FINAL ASSESSMENT REPORT AND CERTIFICATION DECISION

Re-assessment of the Gulf of Alaska Pollock, Bering Sea and Aleutian Islands Pollock Fisheries

Alaska Pollock Fishery Client Group

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Objective:

The objective of this report is the re-assessment of the Alaska Pollock fishery against the RFM standard.

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Keywords:
RFM, Alaska, pollock

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

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0	19.09.2017	Peer Review Report	Andy Hough, Anna Kiseleva, Bill Brodie, Paul Knapman
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0	05.12.2017	Final Assessment Report and certification decision	Andy Hough, Anna Kiseleva, Bill Brodie, Paul Knapman

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

1 SUMMARY AND THE UNIT OF THE CERTIFICATION

The purpose of this report is a full re-assessment of the Alaska Pollock fishery against the RFM standard.

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

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

The Alaska RFM Certification 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 General information and the Unit of the Certification

Fishery name	Alaska Pollock Fishery		
The Unit of the Certification	Applicant Group: Alaska Pollock Fishery Client Group Product Common Name (*Species*): Alaska Pollock (*Gadus chalcogrammus*) Geographic Location: Gulf of Alaska and Bering sea & Aleutian Islands within Alaska jurisdiction (200 nautical miles EEZ). Gear Types: Pelagic Trawl (main), other gears (bottom trawl, jig, longline, pot) from other non-directed pollock fisheries legally landing pollock Principal Management Authority: National Marine Fisheries Service; North Pacific Fishery Management Council; Alaska Department of Fish and Game; Alaska Board of Fisheries		
Date certified	6 December 2011	Date of certificate expiry	5 December 2017
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 2 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	The Alaska pollock commercial fisheries are managed by the North Pacific Fishery Management Council (NPFMC) (hereafter referred to as "Council") and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, Alaska pollock fisheries are managed under the Council's Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The state pollock fishery in Prince William Sound (PWS) is managed using a Guideline Harvest Level (GHL) set as a percentage of the GOA federal Allowable Biological Catch (ABC). The US Coast Guard (USCG), the NMFS Office of Law Enforcement (OLE) and the Alaska Wildlife Troopers (AWT) and/or deputized ADFG staff, enforce fisheries regulations in federal and state waters respectively.
2: Coastal area management frameworks	High	The NMFS and the Council participate in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. These include decision-making processes and activities relevant to fishery resources and users in support of sustainable and integrated use of living marine resources and avoidance of conflict among users. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. With regards to conflict avoidance and resolution between different fisheries, the Council and the BOF tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. Both entities provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourage stakeholder participation, and their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance of potential fisheries conflicts.
3: Management objectives and plan	High	The Magnuson Stevens Fishery Conservation and Management Act (MSA) is the primary domestic legislation governing the management of the nation's marine fisheries. Under the MSA, the council is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a Fishery Management Plan (FMP) and any necessary amendments, for each fishery under its authority that requires conservation and management. These include Groundfish FMPs for the Gulf of Alaska (GoA) and the Bering Sea & Aleutian Islands (BSAI) which incorporate the pollock fisheries in those regions. Both FMPs present long-term management objectives for the Alaska pollock fishery. These are reviewed annually by the Council. In state waters (0-3 nautical miles - nm), the PWS pollock fishery is managed by ADFG and the BOF using "5 AAC 28.263.

		Prince William Sound Pollock Pelagic Trawl Management Plan" which sets the regulations for the directed state pollock fishery.
4: Fishery data	High	The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the pollock fishery and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. Records of catch and effort are firstly recorded through the e-landing (electronic fish tickets) catch recording system and secondly, collected by vessel captains in voluntary and required logbooks. Fishery independent data are collected in regular surveys of both the GOA and BSAI regions and additional fishery dependent data are collected by the observer program present in both regions. A summer acoustic trawl survey is carried out annually, alternating between the GOA and EBS areas. Bottom trawl surveys are carried out yearly in the EBS and biennially in the GOA and AI. Other sources of data (such as vessel-of-opportunity, crab, and international surveys) are also considered during the stock assessment process. The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys in winter (when possible).
5: Stock assessment	High	Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the AFSC. Scientists at the AFSC conduct research and stock assessments on pollock in Alaska each year, producing annual Stock Assessment and Fishery Evaluation (SAFE) reports for the federally managed EBS, GOA, Aleutian Islands and Bogoslof pollock stocks. ADFG also conducts scientific research and surveys on its state-managed Pollock fisheries. These SAFE reports summarize the best-available science, including the fishery dependent and independent data, document stock status, significant trends or changes in the resource, marine ecosystems, and fishery over time, assess the relative success of existing state and Federal fishery management programs, and produce recommendations for annual quotas and other fishery management measures. The annual stock assessments are peer reviewed by experts and recommendations are made annually to improve the assessments. An additional level of peer review by external experts is conducted periodically.
6: Biological reference points and harvest control rule	High	The ASFC SAFE reports consist of three volumes: a volume containing stock assessments, a volume containing economic analysis, and a volume describing ecosystem considerations. The stock assessment volume contains a chapter or sub-chapter for each stock or stock complex in the "target species" category, and a summary chapter prepared by the Groundfish Plan Team. Each chapter contains estimates of all annual harvest specifications except TAC, all reference points needed to compute such estimates, and all information needed to make annual status determinations with respect to "overfishing" and "overfished". The NPFMC harvest control system is a complex and multi- faceted suite of management measures to address issues related to

		sustainability, legislative mandates, and quality of information. The tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The EBS pollock stock in Alaska is categorized as tier 1a while the GOA pollock and AI stocks are categorized as tier 3. For Tier 1 stocks, reliable estimates are available of B and BMSY, and a reliable probability density function is available for FMSY. For Tier 3 stocks, the spawner-recruit relationship is uncertain, MSY cannot be estimated with confidence, and the MSY proxy level is defined as B35%. Stocks in tiers 1-3 are further categorized (a) (b) or (c) based on the relationship between B and BMSY (Tier 1) or B40% (Tier 3). The category assigned to a stock determines the method used to calculate ABC and OFL. For pollock stocks, there is an additional threshold, B20%, used as a measure to protect Steller Sea Lions.
7: Precautionary approach	High	There are three core components to the application of the precautionary approach in Alaskan groundfish fisheries. Firstly, the FMP for each management area sets out an Optimum Yield (OY) for the groundfish complex in each of BSAI and GOA Regions as a whole, which includes pollock along with the majority of targeted groundfish species. The second component is the tier system, which assigns each groundfish stock to a tier according to the level of scientific understanding, data available and uncertainty associated with the fishery. Each tier has an associated set of management guidelines, particularly in relation to calculating the level of catch permitted. The more data-deficient a stock, the higher the tier's number, and the more conservatively catch limits are set. At present the GOA and AI pollock fisheries are assigned to tier 3 and the EBS pollock fishery to tier 1. The third component is Overfishing Limit (OFL), Acceptable Biological catch (ABC) and Total Allowable Catch (TAC) system. OFL is the limit reference point of annual catch above which overfishing is determined to be occurring. ABC is a recommended level of annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. 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.
8: Management measures	High	The Magnuson Stevens Act is the federal legislation that defines how fisheries off the United States EEZ are to be managed. From this legislation and NPFMC objectives, the management system for the Alaska groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY, TAC, ABC, OFL, ACL—effort controls (limited access, licenses, cooperatives), time and/or area closures (habitat protected areas, marine reserves), by-catch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), observers, monitoring and enforcement programs, social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL)). Stocks are measured against metrics defined in the MSA and if they are overfished, approaching an

		overfished condition, or overfishing is occurring, specific measures must be taken, such as implementing a rebuilding program within specified timeframes. The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information.
9: 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 along with their qualifications.
10: Effective legal and administrative framework	High	The Alaska pollock fishery fleet 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). State regulations are enforced by the Alaska Wildlife Troopers (AWT).
11: Framework for sanctions and violations	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.
12: Impacts of the fishery on the ecosystem	High	The NPFMC, NOAA (NMFS) and other relevant organisations continue to closely monitor the fisheries and their respective environmental effects. Appropriate significance appears to be allocated to issues of concern (including in response to stakeholder concerns – such as effects on prohibited species (notably salmon and halibut), bycatch populations, endangered species (such as Steller sea lions, seabirds and northern fur seal) and effects on habitat). Fishery management plans, Environmental Impact Assessments and other assessments are kept under review. No changes are

		apparent in the management of the GoA or BSAI fisheries that would detrimentally affect performance against the confidence ratings for any supporting clauses. Full conformance continues against all supporting clauses.
13: The fisheries enhancement	Not Applicable	Not Applicable

1.3 Non-conformances raised and corrective action plans

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

1.4 The recommendation for certification of the Assessment Team

The Unit of Certification	Status of certification	Comment
The Alaska pollock (*Gadus chalcogrammus*) commercial fisheries, under federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management, fished by the directed fishery with pelagic trawl gear [and other gear types (jig, longline, pot, bottom trawl) that can legally land by-caught pollock] within Alaska's 200 nm EEZ.	**Certified, re-assessment completed.**	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.

1.5 Certification decision

Date: 05-12-2016
Project: Alaska Pollock

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	☒ Certify per ☐ Defer ☐ Reject	Formal accreditation pending. New certificate validity 05-december-2017 until 06-december-2022

SIGNED

Name	Signed
Sander Buijs	7-12-2017, Sander Buijs

2 ASSESSMENT TEAM AND PEER REVIEWERS DETAILS

Anna Kiseleva
DNV GL Lead Assessor:

Anna is a senior assessor and a Global service responsible for MSC Fisheries and RFM certification schemes at DNV GL Business Assurance. She holds MSc degree in International fisheries management from the University of Tromsø and MSc degree in Business Management from Murmansk State Technical University. She has over 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

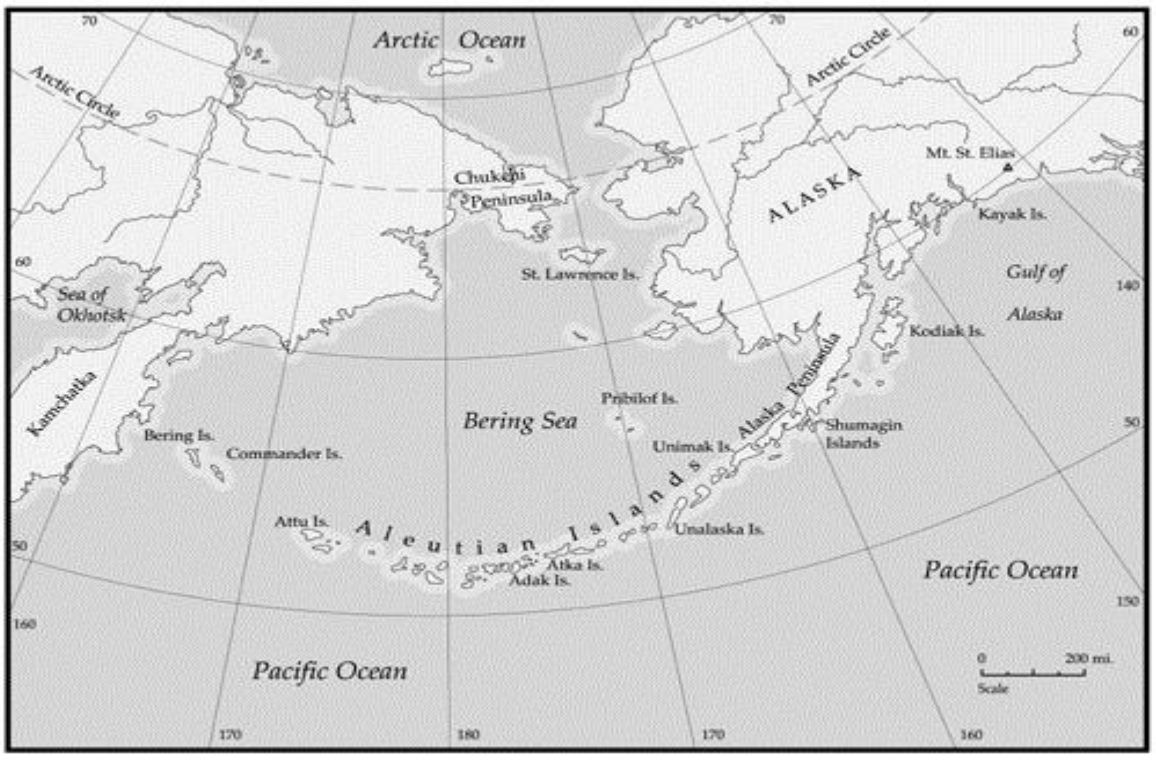
Regional Advisory Council. In 2008, Paul joined Moody Marine as their Americas Regional Manager, responsible for managing and developing their regional MSC business. He became General Manager of the business in 2012. Paul has been involved as a lead assessor, team member and technical advisor/reviewer for more than 50 different fisheries. Paul returned to consultancy in 2015.

3 THE BACKGROUND OF THE FISHERY TO BE RE-CERTIFIED

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

Walleye pollock (*Gadus chalcogrammus*) is a semi-pelagic schooling fish distributed widely in the North Pacific Ocean from California through the Bering and Chukchi Seas to Japan, with the largest fisheries occurring in the Bering Sea (Fig. 3.1.1). In the Gulf of Alaska (GOA), pollock are considered to be a single stock separate from those in the Bering Sea and Aleutian Islands (BSAI). For management purposes, the pollock population in the Eastern Bering Sea and Aleutian Islands (BSAI) has been split into three stocks (Fig. 3.1.2): Eastern Bering Sea (EBS) pollock occupying the eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; Aleutian Islands (AI) pollock encompassing the pollock in the Aleutian Islands shelf region from 170°W to the U.S.-Russia Convention line (Fig. 3.1.3); and the Central Bering Sea-Bogoslof Island (CBS-BI) pollock[1]. These three management stocks likely have some degree of exchange. The Bogoslof stock is thought to form a distinct spawning aggregation that has some connection with the deep water region of the Central Bering Sea/Aleutian Basin.

There is seasonal and interannual variation in both area and patchiness of pollock distribution, along with general preference for waters between 2 and 3 degrees C. In late winter/early spring pollock form very large spawning aggregations in both the EBS and GOA Regions, in areas such as Shelikof Strait (west side of Kodiak Island) and northwest of Unimak Island (Fig. 3.1.1). In summer, large aggregations have been found in GOA areas such as the east side of Kodiak Island, and nearshore along the southern Alaska Peninsula, and in EBS areas such as west of the Pribilof Islands and north of Unimak Island. Pollock migrate seasonally between spawning and feeding areas, and fishing is divided into seasons in the BSAI and GOA management areas.



Fig, 3.1.1 Map showing Bering Sea, Gulf of Alaska, and some place names referred to in this report.
Source: http://www.common-place-archives.org/vol-05/no-02/namias/index.shtml

The three management stocks of pollock within the BSAI area occur largely within the Alaska EEZ, but some migration of pollock to the northwest results in a very small proportion of the Eastern Bering Sea pollock stock being found in the Cape Navarin area of Russia (Fig. 3.1.3). Acoustic research surveys which covered both US and Russian waters, estimated that the Alaskan EEZ contained more than 99% of the

[1] Barbeaux et al. AI pollock SAFE 2016 http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf

pollock stock. Non-USA directed fisheries for pollock in Alaskan waters began in the mid 1960's, but the USA EEZ came into effect in 1977, and since 1988 only U.S. vessels have been operating in this fishery.

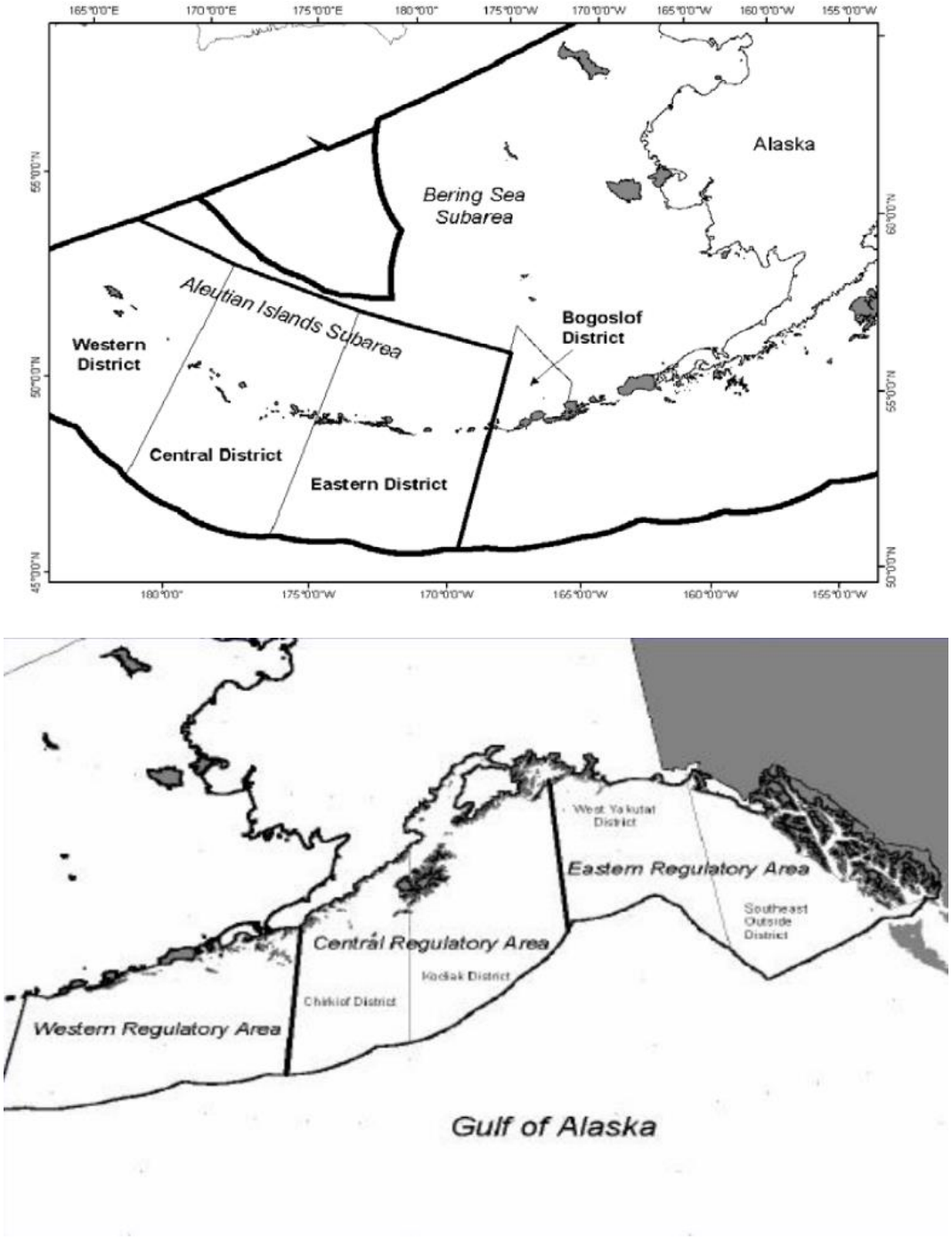


Fig. 3.1.2. Management areas for Bering Sea, Aleutian Islands, and Bogoslof (upper panel), and Gulf of Alaska, lower panel. (Source: NPFMC Groundfish Fishery Management Plans[2],[3]).

[2] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

[3] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

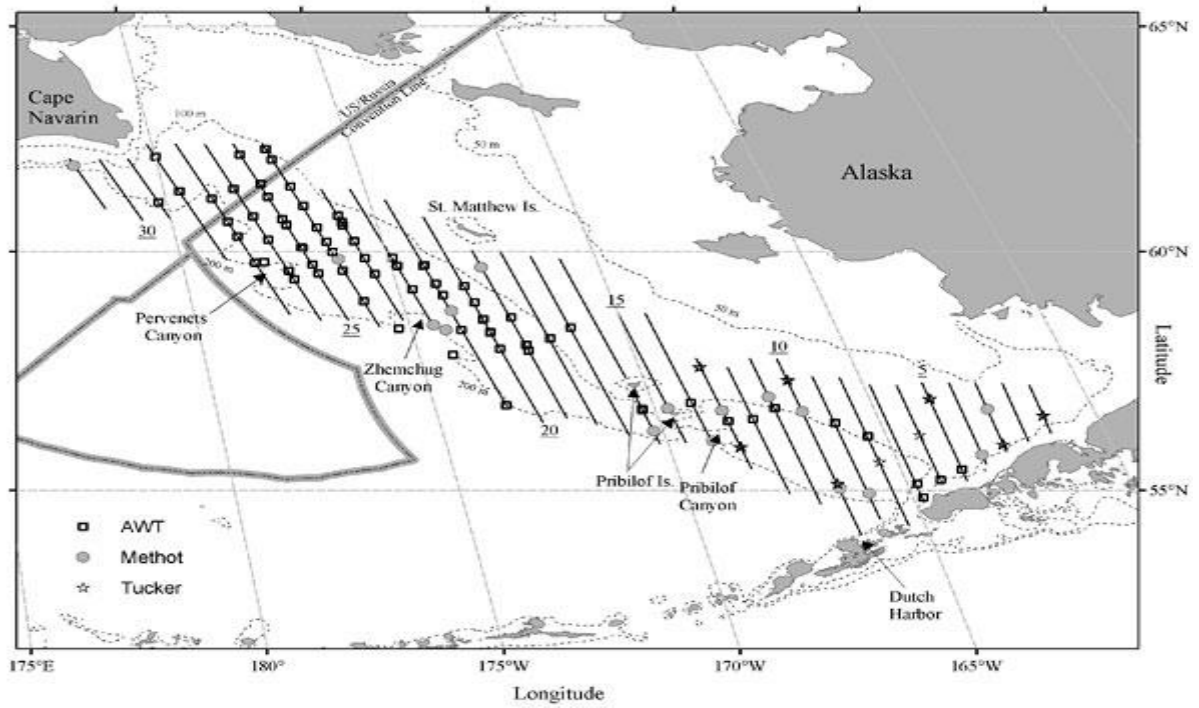


Fig 3.1.3. Map showing location of NMFS/AFSC acoustic survey for pollock survey in Bering Sea, and US-Russia Convention Line. (Source: Fig. 14, NMFS-AFSC publication). https://www.afsc.noaa.gov/Quarterly/jas2010/divrptsRACE5.htm

In Alaskan state waters (within 3 nautical miles of shoreline), ADFG permit a 'parallel fishery' where the state allows fishing against the federal TAC from the adjacent federal waters. The state-managed pollock fishery occurs in Prince William Sound (Fig. 3.1.4).

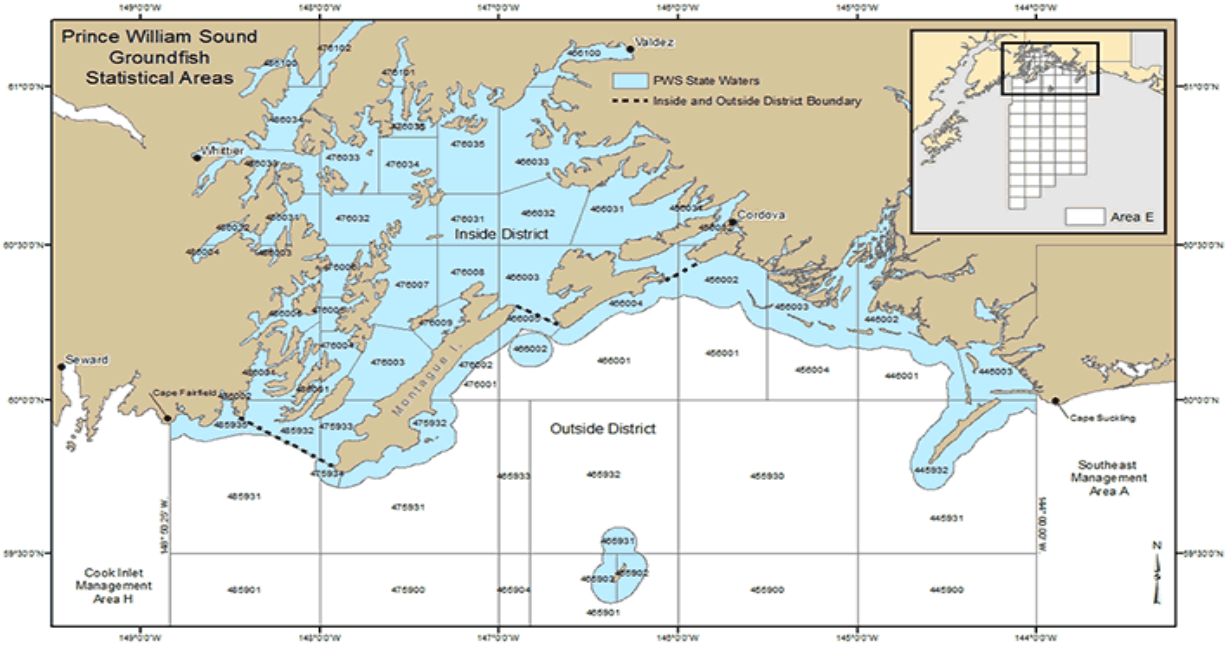


Fig. 3.1.4. Map of Prince William Sound groundfish management area, also showing ADFG state-managed waters. (Source – ADFG[4]).

[4] http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareapws.pws_groundfish_stat_area_map

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

Alaska pollock is currently the largest single species fishery in the world, with stocks concentrated in the North Pacific Ocean. Alaska pollock harvests are large on a U.S. national scale, accounting for 33 percent of total U.S. commercial fishery landings and 14 percent of wholesale production value in 2014[5]. Total catch of pollock in Alaska in 2015 was approximately 1.49 million tons, with almost 90% coming from the EBS area. Main market products include various forms of frozen fillets, surimi, headed/gutted fish, roe, and fish oil & meal. European countries typically account for 80 to 90 percent of all U.S. pollock fillet export value, while Japan and South Korea are the main markets for Alaskan pollock surimi and roe production. Prices for most Alaskan pollock products have generally declined in recent years, although total export value has remained high due to increased volumes.
Fishing is conducted year-round, and in recent years has been divided into 2 seasons in EBS, and 4 seasons in GOA, as well as into areas for each stock. Pelagic trawls are by far the dominant gear in Alaskan pollock fisheries, taking 100% of directed pollock catches in the BSAI, and 90% in GOA. There is no directed fishing for pollock in the AI or Bogoslof areas in recent years.

BSAI: Alaska pollock is the dominant species in terms of catch in the Bering Sea and Aleutian Island (BSAI) region. It accounted for 69% of the BSAI's FMP groundfish harvest and 89% of the total pollock harvest in Alaska. Retained catch of pollock increased 2.2% to 1.32 million t in 2015, and was at a similar level in 2016. BSAI pollock first wholesale value was $1.28 billion in 2015[6]. All pollock fisheries targeting pollock in BSAI use pelagic trawls, and catches in most recent years are often split fairly evenly between catcher vessels and catcher/processor vessels. More details on this fishery are presented in Section 3.1.c below.

GOA: The pollock target fishery in the Gulf of Alaska is entirely shore-based using catcher vessels with approximately 90% of the catch taken with pelagic trawls. Other gears include bottom trawl, jig, longline, and pot. In 2015, the catch was about 168,000 tons, the highest level since 1985, and an increase of just over 60% from the 1977-2015 average[7]. Again, more details on this fishery can be found in Section 3.1.c.

Aleutian Islands: Catches in 1990-95 ranged from 52,000 to 99,000 tons, but the directed fishery for pollock in the Aleutian Islands region was closed in 1999 by NPFMC due to concerns for Steller sea lion recovery. The directed fishery reopened in 2005, but there has been little or no directed fishing in most of the years since 2010. Bycatches of pollock in the AI region have been as high as 2900 tons in some recent years, due mainly to increases in the arrowtooth flounder fishery, but were just over 900 tons in 2015[8].

Bogoslof: Pollock catches in the Bogoslof area were reported to be as high as 377,000 tons in 1987. The Bogoslof region pollock has also been connected with the historical abundance of pollock found in the central Bering Sea (Donut Hole), where catches exceeded 1 million tons annually from 1986-89. In 1992, this entire area was closed to directed pollock fishing, and remains closed at present. In recent years, the majority of pollock bycatch in the Bogoslof region occurred in the non-pelagic trawl fishery targeting arrowtooth flounder. Bycatches have trended upwards from 57 t in 2013, to over 1,000 t in 2016, which is the highest level since 2002[9].

Prince William Sound: Pollock catches have increased in the state-managed PWS pollock fishery in recent years, reaching 4500 tons in 2015, compared to an average of 1900 tons from 2005-2015 (Dorn et al. 2016 SAFE). Pelagic trawl is the main gear, and non-pelagic trawls are not permitted. The management plan (5 AAC 28.263) specifies that the fishery occurs in three sections (areas), and that no more than 60 percent of the catch may be taken from any one section in order to reduce potential impacts on the endangered population of Steller sea lions.

[5] Fissel et al. Economic SAFE 2016. http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf
[6] Ianelli et al. EBS pollock SAFE 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf
[7] Dorn et al. GOA pollock SAFE 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf
[8] Barbeaux et al. AI pollock SAFE 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf
[9] Ianelli et al. Bogoslof pollock SAFE 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/BOGpollock.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 pollock Stock Assessment and Fishery Evaluation (SAFE) by Ianelli et al 2016. Much of the following section and related figures are from that report:

EBS pollock catches were low until directed foreign fisheries began in 1964. Catches increased rapidly during the late 1960s and through 1975 when they ranged from 1.3 to 1.9 million t annually. Following the peak catch in 1972, bilateral agreements with Japan and the USSR resulted in reductions. Since 1977 (when the U.S. EEZ was declared) the annual average EBS pollock catch has been about 1.2 million t, with the lowest catches occurring in 2009-10 when the limits were set at 0.81 million t due to stock declines. All directed fishing for pollock in EBS occurs with pelagic trawls. In 2015, 46.3% of the catch was taken by catcher/processor vessels, and 53.7% by catcher vessels. Of the catcher vessel total, about 17% was caught by vessels delivering to motherships, with the remainder being delivered to shore-side operations. In 2016, a much higher proportion of the catch was taken in the B season, SE of 170 degrees lon., compared to most recent years.

The Western Alaska Community Development Quota (CDQ[10]) 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 Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The current allocation for pollock is 10% of the BSAI pollock TAC.

The "A-season" for directed EBS pollock fishing is from January 20th to early-mid April. The "B-season" runs from June 10th to November 1. The A-season fishery concentrates primarily north and west of Unimak Island depending on ice conditions and fish distribution. Since 2011, regulations and industry-based measures to reduce salmon bycatch have affected the spatial distribution of the fishery and to some degree, the way individual vessel operators fish (Stram and Ianelli, 2014)[11]. The 2016 and 2014 A-season fishery spatial pattern had relatively high concentrations of fishing on the shelf north of Unimak Island, especially compared to the pattern observed in 2015 when most fishing activity occurred farther north (Fig. 3.1.5). The 2016 summer and fall (B-season) fishing continued the trend of fleet-wide higher CPUE, e.g. compared to 2011 B-season, the fleet took about one third of the actual fishing time to reach a similar catch level. Spatially, the 2016 B-season was much more concentrated near the shelf break west of the Pribilof Islands and extending north and west from Amak Island, north of Unimak Island (Fig. 3.1.6). In 2016, the split between A and B season catches in EBS was 510 thousand tons and 784 thousand tons.

Observer coverage in the EBS pollock fishery has been at 100% (often classified as 200% with 2 observers per vessel) for the past several years. Data gathered in the observer program include catch weights (landings and discards), 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. Observers are also assigned to monitor deliveries of pollock to obtain a count of the number of salmon caught as bycatch and to obtain genetic samples from these fish. 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.

Main retained bycatches of other target species in the EBS pollock fishery include Pacific cod, Pacific ocean perch, and various flatfishes (Table 3.1.1), with total catches of all species being about 20,000 tons in 2014 and 2015, i.e. less than 2% of pollock catch weight. Total catch of non-target species is comprised mainly of jellyfish (est. catch in recent years ranging from 2,100 to 13,000 tons). Main bycatches of prohibited species are chum and chinook salmon, and also include some halibut and certain types of crab.

[10] http://www.npfmc.org/community-development-program/

[11] Stram and Ianelli 2014. https://doi.org/10.1093/icesjms/fsu168

Several management measures have been introduced by NPFMC in recent years to address salmon bycatch, such as amendments 91 and 110 to the Fishery Management Plan[12]. The latter mandates the use of salmon excluder devices in the trawls, and reduces fishing for pollock in months with higher bycatch encounters. Substantial research has been conducted on improving the excluder devices, as well as ongoing projects studying the genetics of salmon taken as bycatch to determine their rivers of origin (Guyon et al. 2015[13], Guthrie et al. 2016[14]).

Pollock is considered essential prey for Steller sea lions and management measures, such as fishery time and area closures around critical SSL habitat, as well as reductions in seasonal proportions of pollock TAC that can be taken from critical habitat, have been implemented to mitigate possible negative impacts of pollock fisheries on SSL. In general for the EBS pollock fisheries, habitat degradation has been minimized by converting the BSAI pollock industry to pelagic trawls only.

Table 3.1.1. Bycatch estimates (t) of other target species caught in the BSAI directed pollock fishery, 1997-2015 based on observer reports (*2016 data are preliminary*). (Source – Table 1.38 from Ianelli et al. 2016, EBS pollock SAFE).

	Pacific Cod	Flathead Sole	Rock Sole	Yellowfin Sole	Arrowtooth Flounder	Pacific Ocean Perch	Atka Mackerel	Sablefish	Greenland Turbot	Alaska Plaice	Skates	Squid	Sharks	Sculpin	All other	Total
1997	8,262	2,350	1,522	606	985	428	83	2	123	1					879	15,241
1998	6,559	2,118	779	1,762	1,762	682	91	2	178	14					805	14,751
1999	3,220	1,885	1,058	350	273	121	161	7	30	3					249	7,357
2000	3,432	2,510	2,688	1,466	979	22	2	12	52	147					306	11,615
2001	3,878	2,199	1,673	594	529	574	41	21	68	14					505	10,098
2002	5,925	1,843	1,885	768	606	544	221	34	70	50					267	12,214
2003	5,968	1,706	1,419	210	618	935	762	48	40	7	571	1,226	294	81	327	14,213
2004	6,437	2,009	2,554	841	557	394	1,053	17	18	8	841	977	187	150	436	16,477
2005	7,413	2,319	1,125	63	651	653	678	11	31	45	732	1,150	169	131	490	15,661
2006	7,291	2,837	1,361	256	1,089	736	789	9	65	11	1,308	1,399	512	169	620	18,450
2007	5,630	4,203	510	86	2,795	625	315	12	107	3	1,287	1,169	245	190	726	17,902
2008	6,965	4,288	2,123	516	1,711	336	15	5	85	49	2,756	1,452	144	281	438	21,164
2009	7,878	4,602	7,602	271	2,203	114	25	3	44	176	3,856	209	100	292	305	27,682
2010	6,987	4,309	2,330	1,057	1,502	231	57	2	26	126	1,886	277	26	258	375	19,448
2011	10,041	4,886	8,481	1,083	1,600	660	894	1	29	74	2,353	178	66	315	560	31,219
2012	10,062	3,968	6,701	1,496	749	713	263	1	53	137	2,018	495	55	286	509	27,507
2013	8,958	3,147	6,320	2,088	965	611	70	0	21	148	1,751	117	43	219	241	24,698
2014	5,213	2,554	4,359	1,954	758	1,300	117	1	41	318	813	1,478	75	191	497	19,669
2015	8,303	2,260	1,709	863	403	2,519	195	0	41	99	824	2,206	52	187	342	20,002
2016	4,982	1,641	1,150	885	295	3,280	69	19	29	40	467	1,160	57	126	545	14,743

[12] https://alaskafisheries.noaa.gov/fisheries/chinook-salmon-bycatch-management

[13] Guyon et al. 2015. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-291.pdf

[14] Guthrie et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-310.pdf

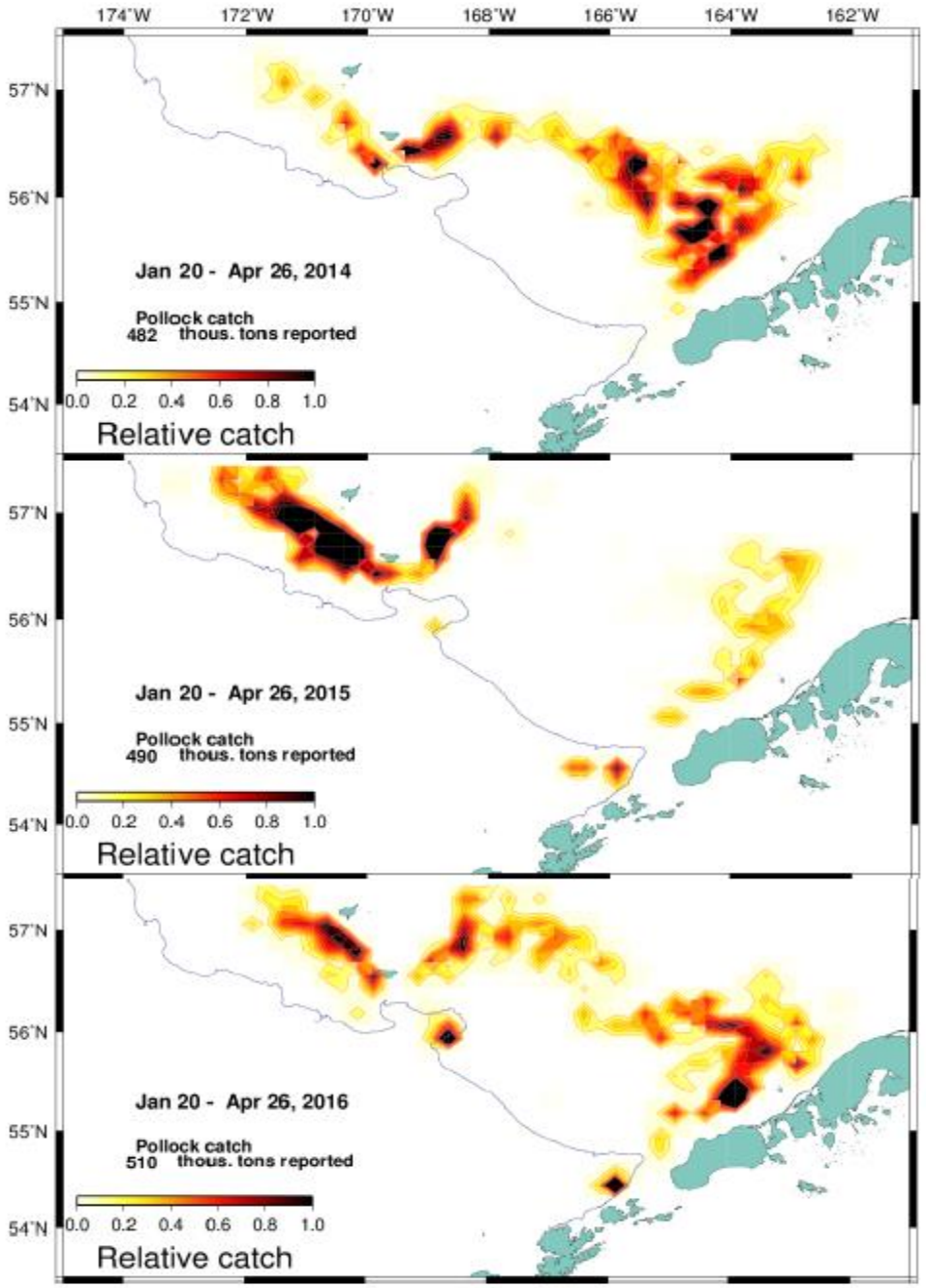


Fig 3.1.5. EBS pollock catches from the "A season" fishery, 2014-2016. (Source: Fig 1.3 from Ianelli et al, 2016 EBS pollock SAFE).

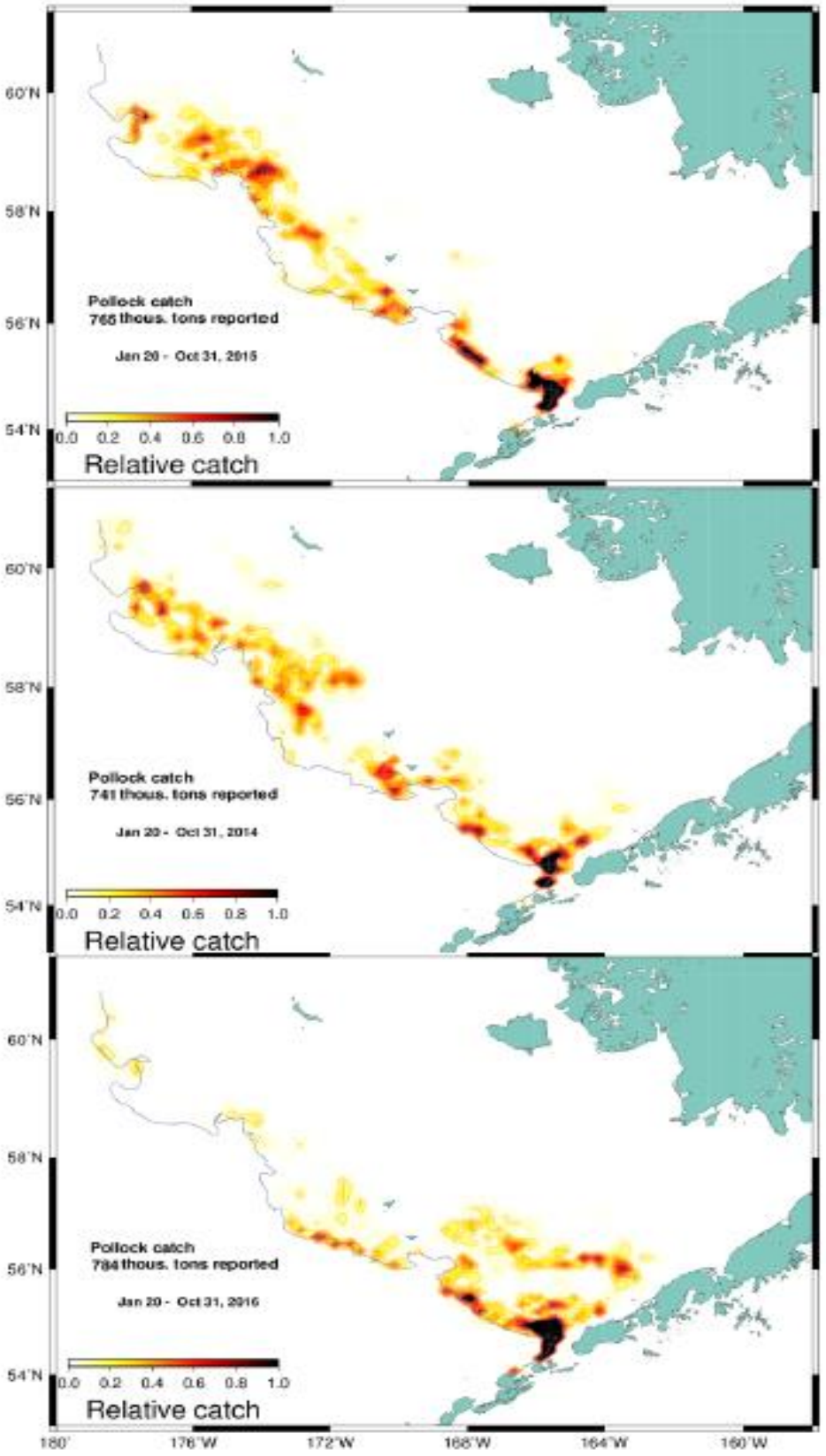


Fig 3.1.6. EBS pollock catches from the "B season" fishery, 2014-2016. (Source: Fig. 1.5 from Ianelli et al, 2016 EBS pollock SAFE).

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

The commercial fishery for pollock in the GOA started as a foreign fishery in the early 1970s, and catches increased rapidly during the late 1970s and early 1980s, exceeding 307 thousand tons in 1984. A large spawning aggregation was discovered in Shelikof Strait, west of Kodiak Island, in 1981, and a fishery developed for which pollock roe was an important product. The domestic fishery for pollock developed rapidly in the GOA with only a short period of joint venture operations in the mid-1980s, and by 1988 the fishery was fully domestic[15]. Catches peaked at around 300 thousand tons in 1984-85, and have been as low as 44 thousand tons, in 2009. Since then, catches have increased fairly steadily, to 168 thousand tons in 2015, which is the highest level since the mid-1980's.

The Steller Sea Lion Protection Measures implemented in 2001 established four seasons for pollock fishing in the Central and Western GOA beginning January 20, March 10, August 25, and October 1, with 25% of the total TAC allocated to each season. During winter, fishing effort typically targets pre-spawning aggregations in Shelikof Strait and near the Shumagin Islands. Fishing in summer is less predictable, but typically occurs in deep-water troughs on the east side of Kodiak Island and along the Alaska Peninsula (Fig. 3.1.7).

Incidental catch in the GOA directed pollock fishery is low (Table 3.1.2). For tows classified as pollock-targeted in the Gulf of Alaska between 2011 and 2015, on average about 95% of the catch by weight consisted of pollock (Dorn et al 2016). The most common managed species in the incidental catch are arrowtooth flounder, Pacific cod, Pacific ocean perch, other flatfishes, and squid. The most common non-target species are jellyfish and eulachon. Bycatch estimates for prohibited species catch (PSC) indicate that Chinook salmon is the most important prohibited species caught as bycatch in the GOA pollock fishery. Other PSC species include chum salmon, halibut, herring, and various crabs.

In 2012, Amendment 93 was implemented in the GOA to limit the amount of Chinook salmon caught in the pollock fishery. Amendment 93 establishes separate PSC limits in the Central and Western GOA for Chinook salmon, which would cause NMFS to close the directed pollock fishery in the Central or Western regulatory areas of the GOA, if the applicable limit is reached.

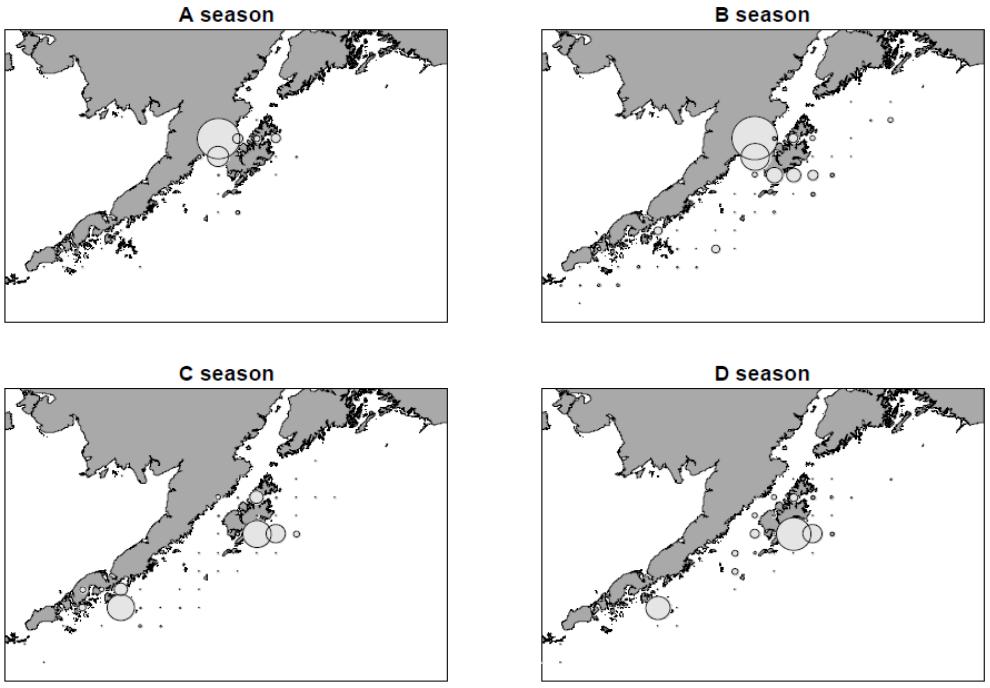


Fig. 3.1.7. Pollock catch in GOA in 2015, by 1/2 degree latitude by 1 degree longitude blocks, by season, from fishery observer data. Blocks with less than 1.0 t of pollock catch are not shown. The area of the circle is proportional to the catch. (Source: Fig. 1.1 from Dorn et al., GOA pollock 2016 SAFE).

[15] Dorn et al. GOA pollock SAFE 2016 http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

Table 3.1.2. Incidental catch (t) of FMP (managed) species in the pollock directed fishery in the Gulf of Alaska in 2011-2015. From Table 1.2 Dorn et al. 2016 SAFE.

Managed species/species group	*2011*	*2012*	*2013*	*2014*	*2015*
Pollock	77297.5	99643.9	91514.2	137611.0	163899.6
Arrowtooth Flounder	2008.6	1328.6	1765.3	2464.3	1671.1
Pacific Cod	1500.5	1267.0	1041.7	3286.8	1711.4
Pacific Ocean Perch	172.3	294.6	426.9	529.9	175.5
Flathead Sole	217.3	189.5	381.4	355.9	438.7
GOA Shallow Water Flatfish	289.4	171.2	183.4	248.9	357.6
Squid	208.8	6.7	346.2	143.5	465.3
GOA Rex Sole	90.0	48.8	151.1	270.8	145.9
GOA Big Skate	92.6	47.8	228.0	171.0	62.8
Salmon Shark	5.7	52.9	2.8	144.0	368.7
GOA Longnose Skate	35.0	9.0	25.2	179.7	87.4
Sablefish	32.5	6.7	12.6	30.4	129.9
Sculpin	53.4	20.2	17.5	43.3	26.8
Northern Rockfish	13.7	60.7	5.6	15.1	16.6
GOA Shortraker Rockfish	24.4	21.8	22.6	27.7	14.0
GOA Rougheye Rockfish	34.5	21.2	8.9	25.2	12.4
Spiny Dogfish Shark	16.5	19.2	11.5	13.6	35.6
GOA Deep Water Flatfish	14.6	3.0	12.8	35.3	15.0
GOA Thornyhead Rockfish	1.8	0.5	0.6	42.3	24.2
GOA Other Skates	1.9	5.5	23.9	17.0	17.7
GOA Dusky Rockfish	19.1	4.1	6.5	13.1	15.0
Pacific Sleeper Shark	3.6	3.9	15.3	6.3	12.0
Atka Mackerel	0.1	0.3	0.4	3.5	25.2
Octopus	2.3	0.4	0.3	7.2	4.3
Other Sharks	1.1	3.7	1.0	2.2	6.1
Other Rockfish	6.8	0.8	0.7	1.3	1.8
Percent non-pollock	*5.9%*	*3.5%*	*4.9%*	*5.5%*	*3.4%*

3.2 Alaska pollock biology

Species biology: There are numerous sources of information on pollock biology, including the SAFE documents, various primary publications, other NMFS and ADFG reports, and a recent book by Bailey (2013). Much of the information that follows in this section has been taken from the Alaska Fisheries Science Center (AFSC) website which provides summaries for pollock biology and relevant studies[16] under various headings.

Pollock is widely distributed in the North Pacific Ocean with the largest concentrations found in the eastern Bering Sea. It is considered a relatively fast growing and short-lived species and currently represents a major biological component of the Bering Sea ecosystem. The separation of pollock in Alaskan waters into Bering Sea and Gulf of Alaska stocks is supported by analysis of larval drift patterns from spawning locations, as well as genetic/DNA.

As semi-pelagic schooling fish, pollock are found on or near the sea bottom as well as at mid water and near-surface depths, although most catches are found between 50 and 300 m. Juvenile (age 0) pollock in their first months of life are found above the thermocline in the Bering Sea. It has been observed that age 0 pollock avoid depths where water temperature is less than approximately 2.5 to 3.0°C (Mueter et al. 2011[17]). Age 0 pollock begin to settle to the bottom in the fall months, after which they mainly occupy semi demersal waters. Concentrations of adult pollock in the Bering Sea are usually found in water temperatures between 2 and 4°C.

Pollock spawn in shallow (90 to 200 m) waters of the outer EBS continental shelf. Oceanic spawning has been reported over waters 640 m deep, south of Seward, Alaska, and in the Aleutian basin. Spawning aggregations of pollock in the EBS occur near Bogoslof Island, north of Unimak Island and the Alaska Peninsula, and northwest of the Pribilof Islands, while in the Gulf of Alaska, they occur mainly in the Shelikof Strait and the Shumagin islands. Spawning in the Bering Sea occurs at temperatures of 1 to 3°C.

[16] https://www.afsc.noaa.gov/species/pollock.php

[17] Mueter et al. http://icesjms.oxfordjournals.org/content/68/6/1284.full.pdf)

However, temperature at time of spawning is apparently not as important for the Shelikof Strait spawning population. In the Bering Sea, spawning begins in late February, with fish in the southeastern Bering Sea spawning first. Most spawning occurs from late March to mid-June, with a peak in May. In the western Gulf of Alaska most spawning occurs in March and April. Spawning and pre-spawning fish move high in the water column, forming dense schools. Some spawning may also occur under the sea ice.

Seasonal migration of pollock occurs between spawning and feeding areas. In the Bering Sea, pollock follow a circular pattern of migration, moving inshore to the shallow (90 to 140 m) waters of the continental shelf to breed and feed in the spring (March), and moving to warmer, deeper areas of the shelf (160 to 300 m) in the winter months (December-February). Similar movement has also been noted in the Gulf of Alaska.

Pollock enter the fishery around age 3, may live up to 17 years and reach a length of 100 cm. Males and females are indistinguishable externally and typically begin to reproduce around 2-3 years of age, with age of 50% maturation being about 4. Spawning occurs at different seasons depending upon location; in Alaska between March and May. Females spawn in several batches over a few weeks, producing up to 2 million small eggs, although fecundity is sometimes difficult to estimate. The eggs hatch in 1-3 weeks at the depth of spawning (usually 100-250 m), and larvae develop in shallow water (<30 m). There is some effect of spawner biomass on production of recruits, but the effect is generally considered to be smaller than the impact of environmental conditions.

Young-of-the-year juveniles feed on plankton near the surface at night and descend during the day, while older fish consume copepods, shrimp, and euphausiids, with fish becoming more important in the diet as pollock grow larger, particularly in EBS. In GOA, all ages of pollock feed mainly on zooplankton during the summer growing season, and cannibalism is not as prevalent as in the Eastern Bering Sea (Dorn et al. 2016 SAFE). Fish consumption in GOA is low even for large pollock (Yang and Nelson 2000[18]), while data for EBS indicate that pollock is the third largest prey item for adult pollock.
Pollock are an important prey for a wide range of piscivorous fishes and marine mammals, including arrowtooth flounder, Pacific halibut, Steller sea lions, and fur seals. In GOA, it is estimated that for pollock less than 20 cm in length, arrowtooth flounder represent close to 50% of total mortality.

3.3 Scientific stock assessment

The assessment models used for the pollock stocks in Alaska take into account all sources of fishing mortality and are based on complete catch reporting systems including extensive observer data. All retained catch and discards of pollock are included in the total catch amounts input into the models. The assessments take into account various relevant aspects of pollock biology. The assessments of GOA, EBS, and AI pollock use a Bayesian approach, consider sources of uncertainty where possible, and evaluate stock status relative to reference points in a probabilistic way. The software used in the assessments is AD Model Builder-based (see Fournier et al. 2012[19] for further description). The Bogoslof pollock assessment relies on survey biomass estimates and a simpler random effects model.

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

A statistical age-structured stock synthesis assessment model was applied over the period 1964-2016. The model was similar to the one used in 2015, using 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 several hundred parameters estimated conditionally on data and assumptions from the model. In addition to updating/adding data from 2015-16, the 2016 SAFE authors noted several modifications in the method used in 2016, including:

- the method of estimating current and future year mean body weight at age was updated
- treatment of uncertainty in current-year fishery mean weights-at-age and those used for near term projections
- surveys were fitted to biomass estimates instead of abundance
- an alternative for specifying the stock-recruit relationship for projection purposes

[18] Yang, M-S. and M. W. Nelson. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-112.pdf

[19] Fournier, D.A., H.J. Skaug, J. Ancheta, J. Ianelli, A. Magnusson, M.N. Maunder, A. Nielsen, and J. Sibert. 2012. AD Model Builder: using automatic differentiation for statistical inference of highly parameterized complex nonlinear models. Optim. Methods Softw. 27:233-249.

Most of the modifications to the methods were adopted based on a 2016 review by the Center for Independent Experts (CIE) and feedback from Sept.-Oct. 2016 presentations to the NPFMC's Plan Team and Scientific and Statistical Committee (SSC).

A simplified version of the assessment (with mainly the same data and likelihood-fitting method) was included as a supplemental multi-species assessment model, to allow for trophic interactions with key predators for pollock and to evaluate age and time-varying natural mortality.

The following table from Ianelli et al. 2016 SAFE shows the input data used in the EBS pollock assessment:

Source	Type	Years
Fishery	Catch biomass	1964-2016
Fishery	Catch age composition	1964-2015
Fishery	Japanese trawl CPUE	1965-1976
EBS bottom trawl	Area-swept abundance (numbers) index by age	1982-2016
Acoustic trawl survey near surface – 3m from bottom	Population abundance (numbers) index by age	1979, 1982, 1985, 1988, 1991, 1994, 1996, 1997, 1999, 2000, 2002, 2004, 2006-2010, 2012, 2014, 2016
Acoustic vessels of opportunity (AVO)	Population abundance (numbers) index	2006-2015

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 pollock, this survey provides an important abundance index as well as information on the population age structure. This survey is complemented by the acoustic trawl surveys that sample mid-water components of the pollock stock. Between 1991 and 2016 the BTS biomass estimates ranged from 2.28 to 8.39 million t, with the 2016 value just above the series average at 4.91 million t (Table 3.3.1, Fig 3.3.1). Pollock were distributed more patchily in 2016 than in recent years and were most concentrated in the outer domain. The spatial distribution of pollock densities in the 2016 survey appeared to be split with high densities in the southeast and northwest of the main survey area (Fig 3.3.2). Surface and bottom temperatures in the 2016 survey were the highest in the time series, following warm years in 2014 and 2015 also.

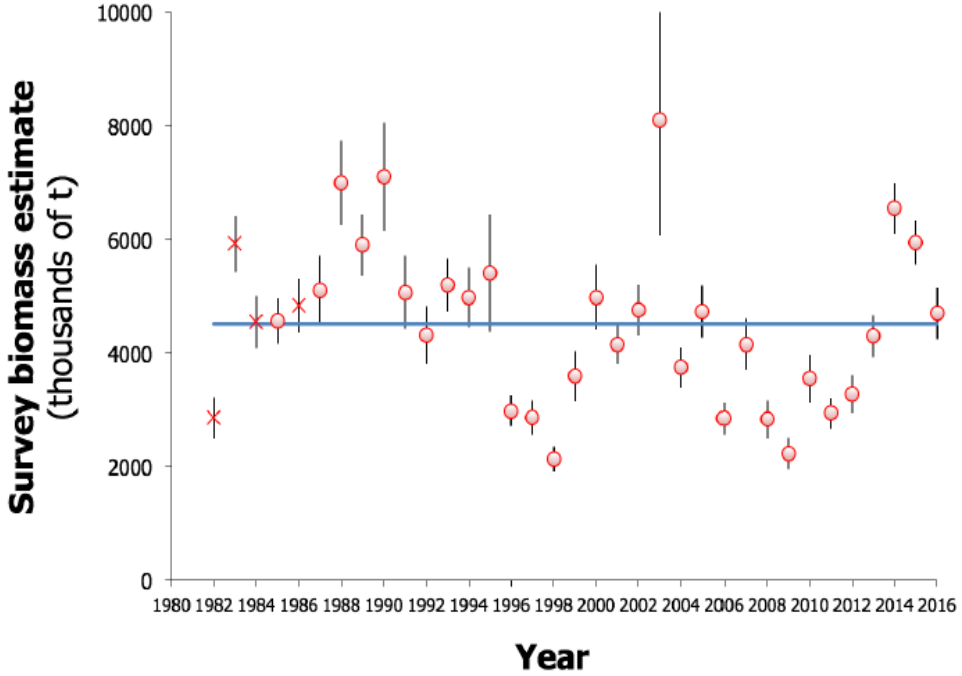


Fig 3.3.1. Bottom-trawl survey biomass estimates with approximate 95% confidence bounds for EBS pollock, 1982-2016. Horizontal line represents the long-term mean. (From Fig. 1.9 of Ianelli et al. 2016 EBS pollock SAFE).

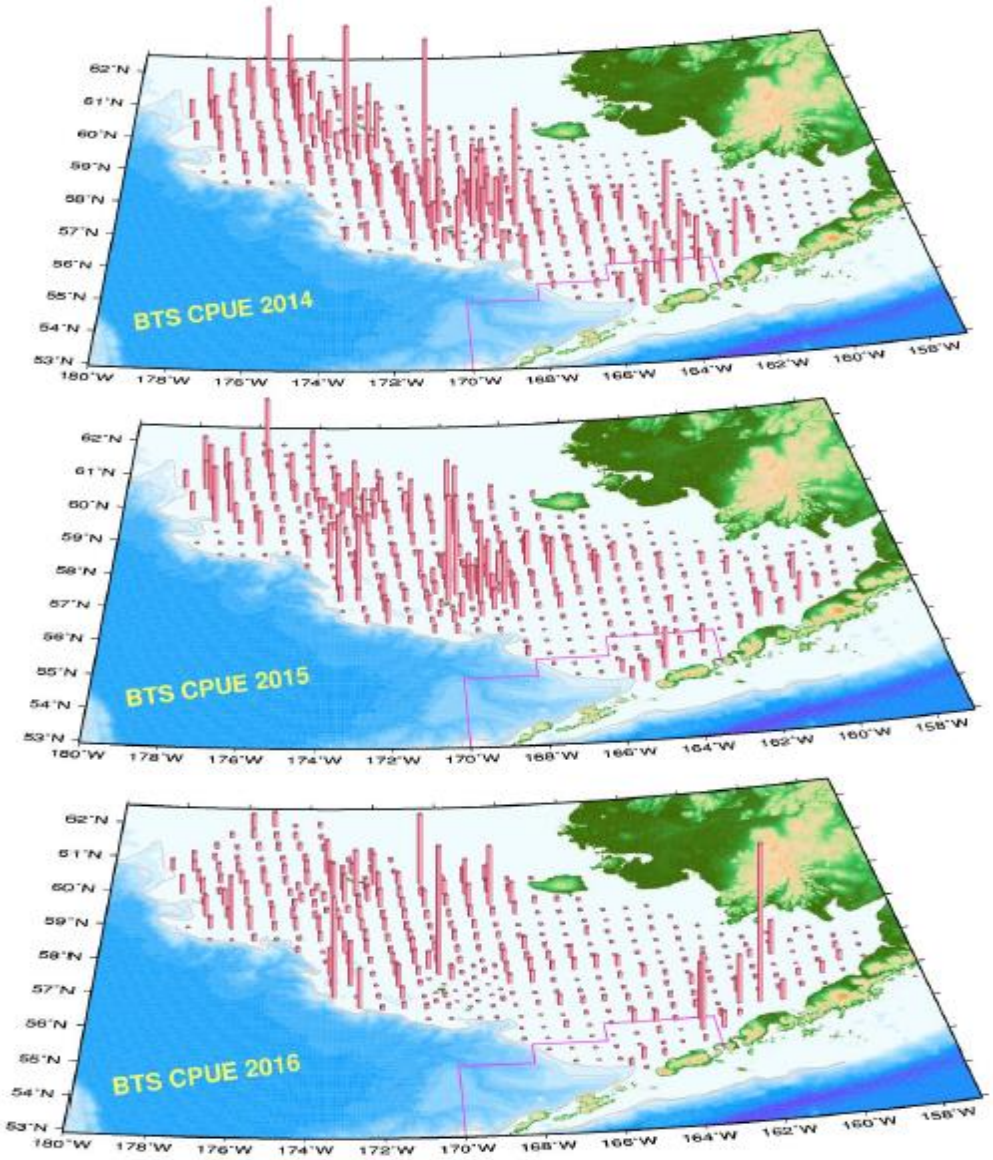


Figure 1.12. Bottom trawl survey pollock catch in kg per hectare for 2014 - 2016. Height of vertical lines are proportional to station-specific pollock densities by weight (kg per hectare) with constant scales for all years.

Fig. 3.3.2. Pollock in bottom trawl surveys from 2014-16 in EBS (from Fig. 1.12 Ianelli et al. 2016 SAFE).

Acoustic trawl survey: The AT surveys are conducted biennially and are designed to estimate the off-bottom component of the pollock stock (compared to the BTS which are conducted annually and provide an abundance index of the near-bottom pollock). The midwater pollock biomass estimate from the 2016 AT survey of 4.06 million t is above the average of 2.76 million t (Fig. 3.3.3). Of particular note was very few age 1 pollock were found whereas age 3 (the 2013 year class) was the most abundant age group followed by four year olds. Spatially, the 2016 mid-water pollock distribution was somewhat consistent with recent years.

Table 3.3.1. Biomass (age 1+, millions of t) of EBS pollock as estimated by surveys 1979-2016. (From Table 1.14, Ianelli et al 2016 SAFE).

Year	Bottom trawl Survey	AT Survey	AT % age 3+	Total*	Near bottom biomass
1979		7.458	22%		
1980					
1981					
1982	2.856	4.901	95%	7.757	37%
1983	6.258				
1984	4.894				
1985	5.955	4.799	97%	10.754	55%
1986	4.897				
1987	5.498				
1988	7.289	4.675	97%	11.964	61%
1989	6.550				
1990	7.316				
1991	5.130	1.454	46%	6.584	78%
1992	4.583				
1993	5.631				
1994	5.027	2.886	85%	7.913	64%
1995	5.478				
1996	3.415	2.311	97%	5.726	60%
1997	3.800	2.591	70%	6.391	59%
1998	2.781				
1999	3.798	3.285	95%	7.083	54%
2000	5.281	3.049	95%	8.330	63%
2001	4.197				
2002	5.033	3.622	82%	8.655	58%
2003	8.392				
2004	3.863	3.307	99%	7.170	54%
2005	5.321				
2006	3.045	1.560	98%	4.605	66%
2007	4.338	1.769	89%	6.107	71%
2008	3.023	0.997	76%	4.020	75%
2009	2.282	0.924	78%	3.206	71%
2010	3.738	2.323	65%	6.061	62%
2011	3.112				
2012	3.487	1.843	71%	5.330	65%
2013	4.575				
2014	7.430	3.439	65%	10.869	68%
2015	6.390				
2016	4.910	4.063	97%	8.973	55%
Average	4.843	2.763	85%	7.140	62%

Acoustic vessels of opportunity (AVO): Acoustic data from the two commercial fishing vessels chartered for the eastern Bering Sea bottom trawl (BT) survey are used to compute a midwater abundance index for pollock (see Honkalehto et al. 2017[20] for details on most recent survey, and methods). This index is updated during years when the directed acoustic-trawl survey is *not* carried out in the EBS to provide an additional source of information on pollock found in mid-water. There is good correlation between the two acoustic series. The AVO index used for this assessment shows a steady increase in pollock biomass for the period 2009-2015 (Fig. 3.3.6).

[20] Honkalehto et al. 2017 https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-04.pdf

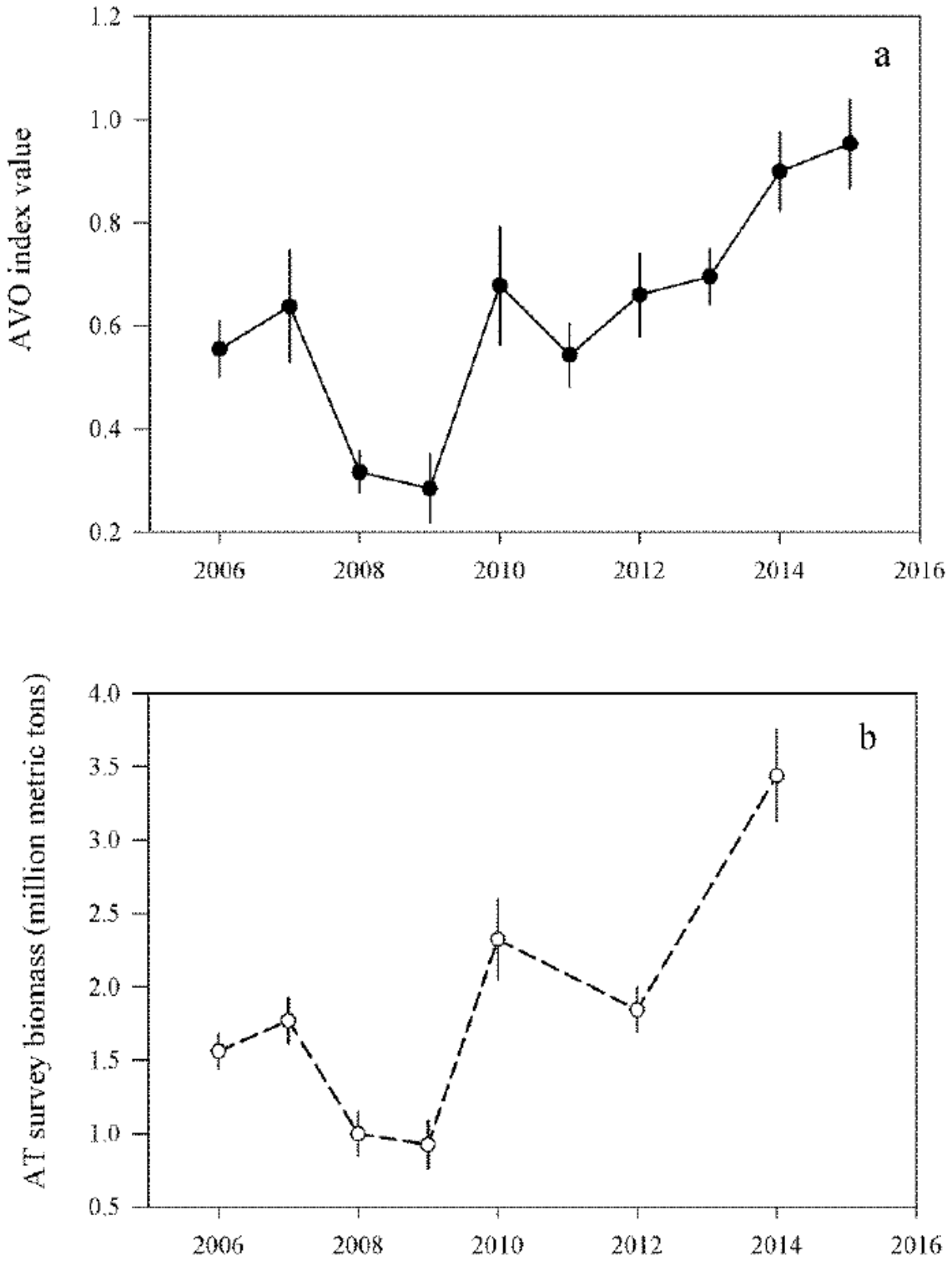


Fig. 3.3.3. EBS pollock: Acoustic vessel-of-opportunity (AVO) Index estimates for 2006-2015 from the EBS bottom trawl survey (upper panel) and corresponding acoustic-trawl (AT) survey biomass estimates (lower panel). Error bars are 95% confidence intervals. (From Fig.1, Honkalehto et al. 2017).

EBS Assessment results: The age 3+ biomass of EBS pollock shows peaks in the mid-1980s, the mid-1990s and again appears to be increasing to a new high over 13 million t, following the low in 2008 of

4.9 million t (Table 3.3.2). Projected spawning biomass in 2017 is estimated to be 4.6 million t, more than double the B_{MSY} estimate of 2.17 million t. Estimates of age 1 recruits have been below average in 2015 and 2016, following 2 above-average cohorts, with age 1 in 2013 being among the highest points in the time series (Table 3.3.4). The level of fishing relative to biomass estimates (spawning exploitation rate) has been mostly below 20% since 1980. During 2006 and 2007 this rate averaged more than 20% and the average fishing mortality for ages 3-8 increased during the period of stock decline. The estimate for 2009 through 2016 was below 20% due to the reductions in TACs relative to the maximum permissible ABC values and increases in the spawning biomass. The average fishing mortality on ages 3-8 increased in 2011 to above 0.25 when the TAC increased but has dropped since then and in 2016 is estimated at about 0.16. Since 1977 the current estimates of fishing mortality suggest that during the early period, harvest rates were above *FMSY* until about 1980, but since then, fishing mortality has averaged about 35% of the *FMSY* level.

Table 3.3.2. Estimated EBS pollock age 3+ biomass, female spawning biomass, and age 1 recruitment for 1964-2016. Biomass units are thousands of t, age 1 recruitment is in millions of fish. (From Table 1.32 of Ianelli et al. 2016 EBS pollock SAFE).

Year	Age 3+ biomass	Spawning biomass	Age 1 Rec.	Year	Age 3+ biomass	Spawning biomass	Age 1 Rec.
1964	1,834	543	6,670	1990	7,812	2,974	48,848
1965	2,230	643	21,535	1991	6,184	2,235	25,581
1966	2,404	749	15,437	1992	9,477	2,334	22,781
1967	3,667	944	25,796	1993	11,627	3,183	46,863
1968	4,199	1,170	22,271	1994	11,313	3,474	15,943
1969	5,295	1,429	26,141	1995	13,000	3,678	10,905
1970	5,936	1,663	23,500	1996	11,239	3,688	22,878
1971	6,360	1,751	14,578	1997	9,837	3,489	31,178
1972	6,025	1,655	11,964	1998	9,909	3,258	15,483
1973	4,846	1,388	26,909	1999	10,751	3,264	16,827
1974	3,590	1,033	19,909	2000	9,955	3,296	25,850
1975	3,679	877	17,094	2001	9,702	3,323	35,963
1976	3,609	885	13,138	2002	10,025	3,136	23,952
1977	3,536	917	13,755	2003	12,080	3,313	14,626
1978	3,376	923	25,352	2004	11,401	3,417	6,640
1979	3,239	890	61,943	2005	9,599	3,142	4,832
1980	4,069	1,019	27,184	2006	7,391	2,592	12,208
1981	7,814	1,702	30,738	2007	6,047	2,173	26,391
1982	9,057	2,606	16,305	2008	4,946	1,616	14,622
1983	10,240	3,249	52,162	2009	6,374	1,763	56,931
1984	10,033	3,499	13,573	2010	6,658	1,985	22,500
1985	12,237	3,774	34,632	2011	9,638	2,426	13,479
1986	11,531	4,005	14,545	2012	9,627	2,841	11,201
1987	12,143	4,123	7,835	2013	9,504	3,171	63,522
1988	11,497	4,102	5,561	2014	8,948	3,079	31,883
1989	9,756	3,688	11,103	2015	12,407	3,394	18,180
				2016	13,495	4,067	18,951

The authors of the 2016 EBS pollock SAFE note that estimates of reference points related to maximum sustainable yield (MSY) are currently available, however, their reliability is questionable. Therefore, reference points are presented for Tier 1 and Tier 3 to retain the option for classification of the stock in either Tier. Since the 2017 female spawning biomass is estimated to be above B_{MSY} and *B40%* in 2017, and if the 2016 catch equals 1.35 million t, the OFL and maximum permissible ABC values for Tiers 1a and 3a would be:

Tier	Year	MaxABC	OFL
1a	2017	3,120,000 t	3,640,000 t
1a	2018	3,740,000 t	4,360,000 t
3a	2017	2,800,000 t	2,970,000 t
3a	2018	2,979,000 t	3,430,000 t

Based on the standard set of catch projections carried out annually, and comparing the results to the appropriate reference points, the EBS pollock 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 above *B40%* (2,643,000 t) in 2017 and about 212% of the *BMSY* level. The probability that the current stock size is below 20% of *B0*) is <0.1% for 2016 and 2017. The SAFE concluded that the EBS pollock stock appears to have rebounded from the 2008 low point and shows significant increases due to two strong year classes (2008 and 2012). Despite the high biomass estimates, there remain several concerns about the medium-term stock conditions, as listed by the SAFE authors. These include warm conditions in the EBS in 2014-16 which could negatively affect larval and juvenile survival (few 1-year old pollock found in the 2016 acoustic survey), concerns with patchier distribution of pollock in the BTS, and declines in the euphausiid index (key food for pollock) since a peak in 2009. Notwithstanding these concerns, pollock biomass remains high and recent fishing mortality has been relatively low.

Given these factors, a 2017 ABC of 2,800,000 t was recommended in the 2016 SAFE based on the Tier 3 estimates as conservatively selected previously by the SSC in 2014 and 2015. The SAFE authors also recognized that the actual catch will be constrained by other factors such as the 2 million t OY BSAI groundfish catch limit, and bycatch avoidance measures. They concluded that the alternative maximum permissible Tier 1a ABC seems clearly risky. Such high catches would result in unprecedented variability and removals from the stock (and considerably more capacity and effort). Adopting a more stable catch system would also result in less spawning stock variability. The Tier 3a recommendations for OFL and ABC were accepted by NPFMC in December of 2016, and TACs for 2017-18 of 1.345 million tons were established in the harvest specifications. The 2017 TAC was later implemented by NOAA/NMFS[21].

Status Summary for Pollock in Eastern Bering Sea (from Ianelli et al. 2016 SAFE)

	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2016	2017	2017	2018
M (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	1a	1a
Projected total (age 3+) biomass (t)	11,300,000 t	11,000,000 t	13,000,000 t	12,100,000 t
Projected female spawning biomass (t)	**3,540,000 t**	**3,500,000 t**	**4,600,000 t**	**4,500,000 t**
B_0	5,676,000 t	5,676,000 t	5,700,000 t	5,700,000 t
B_{MSY}	1,984,000 t	1,984,000 t	2,165,000 t	2,165,000 t
F_{OFL}	0.514	0.514	0.465	0.465
$maxF_{ABC}$	0.401	0.401	0.398	0.398
F_{ABC}	0.27	0.26	0.36	0.37
OFL (t)	3,910,000 t	3,540,000 t	3,640,000 t	4,360,000 t
maxABC (t)	3,050,000 t	2,760,000 t	3,120,000 t	3,740,000 t
ABC (t)	2,090,000 t	2,019,000 t	2,800,000 t	2,979,000 t
Status	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 estimated catches assuming 1,350,000 t used in place of maximum permissible ABC for 2017 and 2018.

GOA area: *Full description of the model formulation, input data, and results, as well as the Tier 5 assessment of Southeast Outside area pollock, can be found in the 2016 GOA pollock SAFE by Dorn et al. The summaries, tables, and figures which follow below are taken from that document.*

An age-structured model covering the period from 1970 to 2016 was used to assess GOA pollock, as has been the practice for this stock. The age-structured assessment model is similar to the model used for the 2015 assessment and the modeled population includes individuals from age 1 to age 10+. Population dynamics were modeled using standard formulations for mortality and fishery catch. The model was fit

[21] NOAA/NMFS 2017 BSAI pollock TAC https://alaskafisheries.noaa.gov/node/56429

to time series of catch biomass, survey indices of abundance, and estimates of age and length composition from the fishery and surveys. Pollock catches used in the GOA assessment include those taken in the state fishery in PWS.

For pollock in southeast Alaska (Southeast Outside region), available information supported the current approach of assessing and managing pollock in the eastern portion of the Gulf of Alaska (southeast outside) separately from pollock in the central and western portions of the GOA. A Tier 5 assessment was used to estimate biomass in 2017 and 2018 from a model fit to the 1990-2015 bottom trawl survey biomass estimates in Southeast Alaska. This resulted in an ABC recommendation for both 2017 and 2018 of 9,920 t and the OFL for both 2017 and 2018 is 13,226 t. Historically there has been little directed fishing for pollock in this area, and catches since 2000 have averaged only 2 t/yr.

This table from Dorn et al. 2016 SAFE shows the data used in the 2016 GOA pollock assessment.

Source	*Data*	*Years*
Fishery	Total catch	1970-2015
Fishery	Age composition	1975-2015
Shelikof Strait acoustic survey	Biomass	1992-2016
Shelikof Strait acoustic survey	Age composition	1992-2016
Summer acoustic survey	Biomass	2013-2015
Summer acoustic survey	Age composition	2013,2015
NMFS bottom trawl survey	Area-swept biomass	1990-2015
NMFS bottom trawl survey	Age composition	1990-2015
ADFG trawl survey	Area-swept biomass	1989-2016
ADFG survey	Age composition	2000-2014

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. In a typical survey, 800 tows are completed, and on average, 75% of these tows contain pollock. As can be seen in Fig. 3.3.4 below, the 2013 and 2015 survey results were at or near the high points in the series.

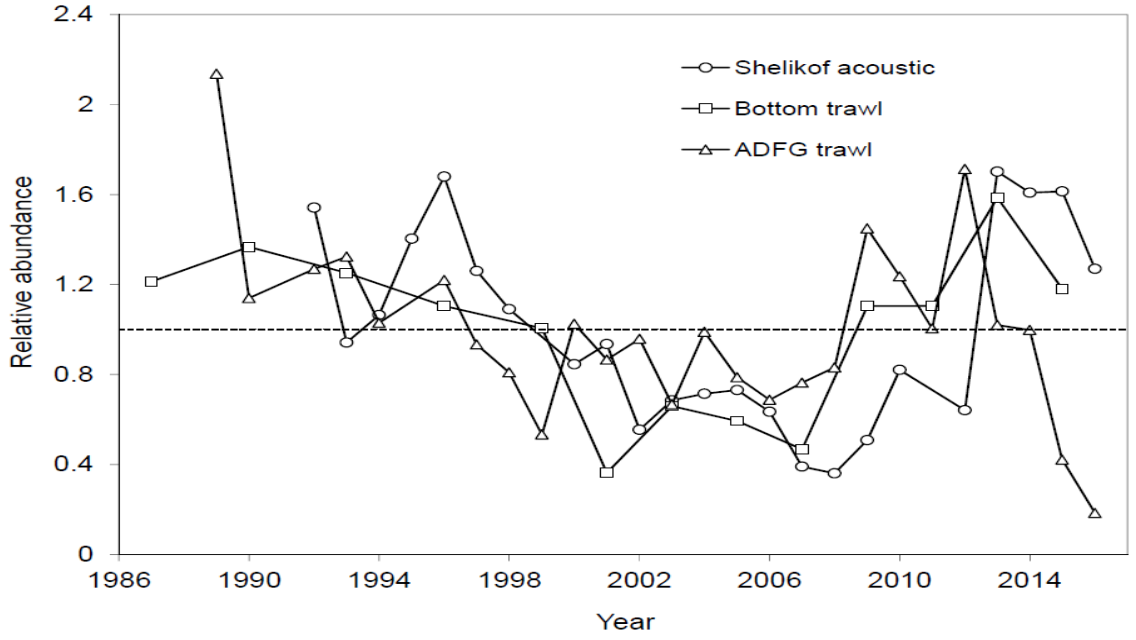


Fig. 3.3.4. Comparison of relative abundance indices from for the NMFS bottom trawl survey, ADFG trawl survey, and Shelikof acoustic survey. (From Fig. 1.14 in Dorn et al. 2016 SAFE).

ADFG bottom trawl surveys: The Alaska Department of Fish and Game (ADFG) has conducted bottom trawl surveys of nearshore areas of the Gulf of Alaska since 1987. Although these surveys are designed to monitor population trends of crab, pollock and other fish are also sampled. Standardized survey methods and trawl gear were employed from 1987 to the present. The survey is designed to sample at fixed stations from mostly nearshore areas from Kodiak Island to Unimak Pass, and the area covered by the survey is a relatively small percentage of the GOA shelf area. The average number of tows completed during the survey is 360, and on average 86% of these tows contain pollock. The 2016 biomass estimate for pollock for the ADFG crab/groundfish survey was 18,470 t, down by 56% from the 2015 biomass estimate, which was already a large decline from the previous year (see Fig. 3.3.4). This is the lowest biomass estimate for the ADFG crab/groundfish time series, which Dorn et al. (2016) noted "seems unusual given that all the other indices used in the assessment remain relatively high".

Shelikof Strait Acoustic Survey: Winter acoustic surveys to assess the biomass of pre-spawning aggregations pollock in Shelikof Strait have been conducted annually since 1981 (except 1982, 1999, and 2011). Only surveys from 1992 and later are used in the stock assessment due to uncertainties with the acoustic data from the earlier surveys. The 2016 survey also covered areas such as Shumagin Islands, Sanak Gully, Pavlof Bay, Morzhovoi Bay, and Marmot Gully, but about 90% of the pollock biomass was found in Shelikof Strait. Biomass was lower in most surveyed areas in 2016 compared to 2015, and was 21% lower in Shelikof Strait, although the estimates in 2013-15 in this area were at or near the highest in the series (Fig. 3.3.4).

Summer Acoustic Survey: Two complete acoustic surveys, in summers of 2013 and 2015, have been conducted by AFSC in the Gulf of Alaska. The area surveyed covers the Gulf of Alaska shelf and upper slope, extending eastward to 140° W lon., and Prince William Sound (PWS) is also surveyed. The survey consists of widely-spaced parallel transects along the shelf, and more closely spaced transects in troughs, bays, in the Shelikof Strait, and in PWS. Mid-water and bottom trawls are used to identify acoustic targets. Total biomass estimates in 2013 and 2015 were 884,049 t and 1,482,668 t.

GOA Assessment results: Information in the following section is from Dorn et al. 2016 SAFE: The model projection of female spawning biomass in 2017 is 363,800 t, which is 54.5% of unfished spawning biomass and above *B40%* (267,000 t), thereby placing GOA pollock in sub-tier "a" of Tier 3 (see Status Summary Table below). Recent biomass estimates have followed a declining trend, to about one-third of unfished biomass level in 2016 (Fig. 3.3.5). Based on the data used in the standard projection scenarios, the 2016 spawning biomass is calculated at 320,094 t, which is above B40%, and the increase projected in the 2017 is due mainly to maturation of the strong 2012 year-class. Mean weights at age, which have been declining, are also an important consideration in the biomass projections. Except from the mid-1970s to mid-1980s fishing mortality has generally been lower than the current OFL definition, and in nearly all years was lower than the *FMSY* proxy of *F35%*. The Shelikof Strait acoustic survey remains at high levels and is consistent with assessment model results. The large and unexplained decline in pollock biomass in the 2015 ADFG survey continued in 2016, which is a concern, especially since this time series has been the most stable used in the assessment. As a result of these low observations being included in the model, the estimated ABCs and OFLs for 2017-18 are lower than in the previous assessment.

Although the GOA pollock stock is currently estimated to be at relatively high abundance, it is apparent there is now a period of increased uncertainty regarding future abundance trends. There has been a marked decline in pollock weight at age, a lack of recruitment to the stock for three years, and most of the stock consists of a single very strong year class (Fig. 3.3.5). In 2017, there will be a full complement of assessment surveys in the Gulf of Alaska, so it is reasonable to expect that this uncertainty will be reduced when the results of these surveys are available.

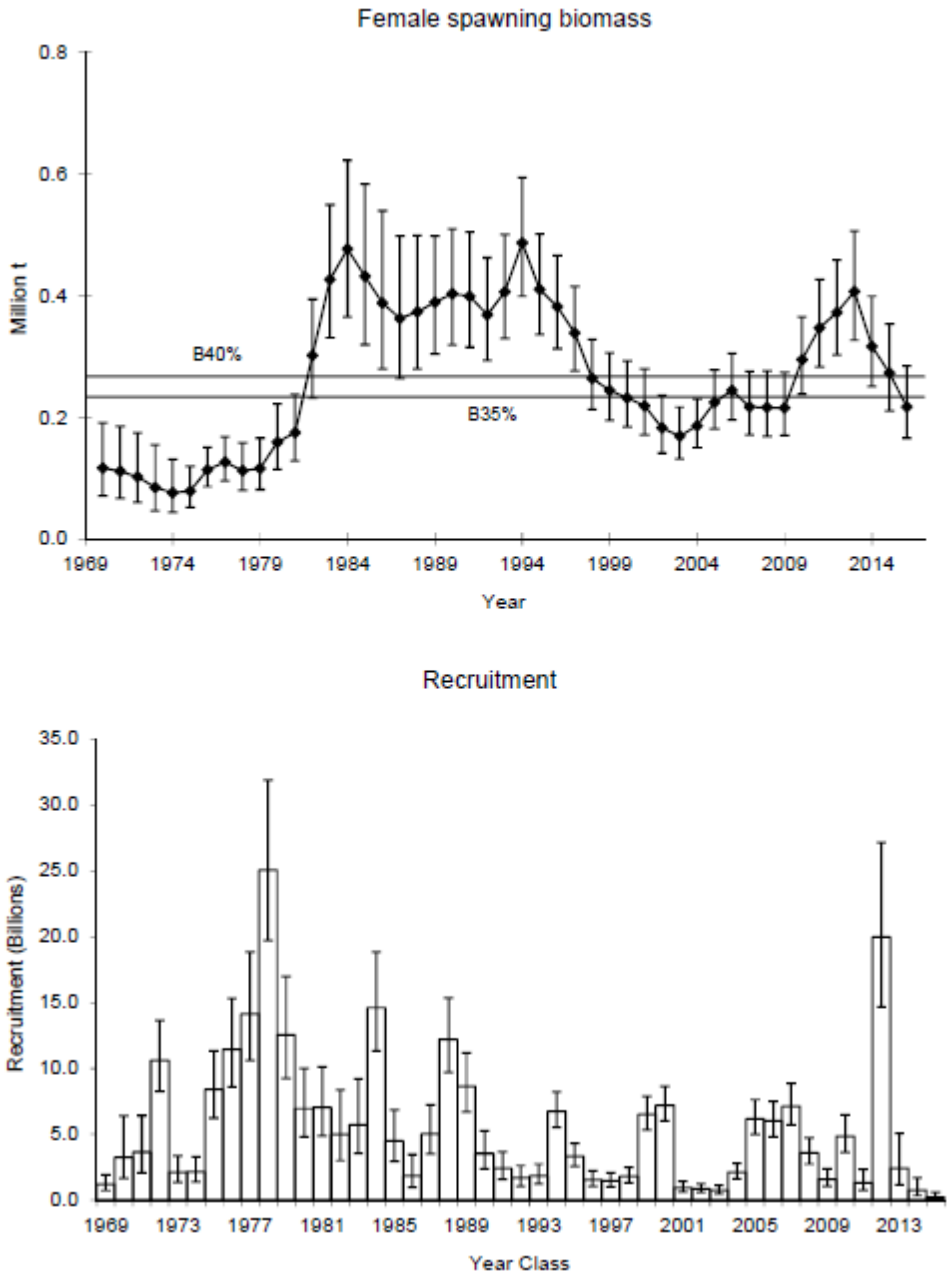


Fig. 3.3.5. Estimated time series of GOA pollock spawning biomass (million t, top) and age-1 recruitment (billions of fish, bottom) from 1970 to 2016 for the base model. Vertical bars represent two standard deviations. The *B35%* and *B40%* lines represent the current estimate of these benchmarks. (From Fig. 1.34 of Dorn et al. 2016 SAFE).

The authors' 2017 ABC recommendation for pollock in the GOA west of 140°W lon (W/C/WYK regions) is 203,769 t, which is a decrease of 20% from the 2016 ABC. This recommendation is based on a more conservative alternative to the maximum permissible *FABC* applied to the base model. In 2018, the ABC based *F40%* harvest rate is 157,496 t. The OFL in 2017 is 235,807 t, and the OFL in 2018 if the recommended ABC is taken in 2017 is 182,204 t. It should be noted that declines in ABC over the next few years should be expected, particularly if low recruitment continues. ABCs as low as 100,000 t may occur by 2019. For 2017-18, based on the 2016 stock assessment and defined reference points, and following a series of standard projections, the stock is not currently overfished, has not been subjected to overfishing, and is not approaching an overfished condition. The probability that the projected biomass will drop below the B20% limit by 2021 is estimated at 0.0014 or less in each year. The ABC and OFL levels as recommended were accepted by NPFMC, and TACs for 2017 and 2018 were established in the harvest specifications at 208,595 t and 163,479 t (both including the recommended 9920 t for the

Southeast Outside Area of GOA, which is assessed separately and not shown in the summary table below). NOAA/NMFS later implemented this TAC for the 2017 GOA pollock fishery fishery[22].

Status Summary for Gulf of Alaska Pollock in W/C/WYK Areas

Quantity/Status	As estimated or specified *last* year for 2016	2017	As estimated or specified *this* year for 2017	2018
M (natural mortality rate)	0.3	0.3	0.3	0.3
Tier	3a	3a	3a	3a
Projected total (age 3+) biomass (t)	1,937,900	1,543,100	1,391,290	991,030
Female spawning biomass (t)	321,626	357,193	363,800	348,330
$B_{100\%}$	750,000	750,000	667,000	667,000
$B_{40\%}$	300,000	300,000	267,000	267,000
$B_{35\%}$	262,000	262,000	234,000	234,000
F_{OFL}	0.29	0.29	0.30	0.30
$maxF_{ABC}$	0.25	0.25	0.25	0.25
F_{ABC}	0.23	0.25	0.25	0.25
OFL (t)	322,858	289,937	235,807	182,204
maxABC (t)	278,385	250,544	203,769	157,496
ABC (t)	254,310	250,544	203,769	157,496
Status	As determined *last* year for 2014	2015	As determined *this* year for 2015	2016
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

(From Dorn et al. 2016 GOA pollock SAFE)

AI/Bogoslof/PWS Assessments: Assessment results for these three pollock stock components are published annually, i.e. 2016 SAFE reports exist for the AI and Bogoslof stocks, and ADFG issues a Guideline Harvest Level (GHL) for the PWS area set as a percentage of the federal ABC for GOA pollock. Based on the current assessments, none of these stocks are overfished, and little or no directed fishing for pollock occurs in the AI and Bogoslof areas. Details on these stock components can be found in the relevant SAFE reports but will not be shown here due to the small amounts of catch involved in those fisheries. Status summary tables for Bogoslof and AI pollock are shown below, as taken from the 2016 SAFE reports (Ianelli et al. for Bogoslof, Barbeaux et al. for AI).

In reviewing the assessments in late 2016, the SSC noted that the ABC recommendations for 2017 and 2018 of 130,428 t for Bogoslof pollock represented a large increase from previous years, based on the five-fold increase in biomass in the 2016 survey. The SAFE authors and Plan Team accepted these values from the random-effects model. However, the SSC agrees with the authors and Plan Team that it is appropriate to set ABC below the maximum permissible ABC as an added precaution, and the SSC recommendation[23] was to use a two-year 'stair-step' approach to set ABC for Bogoslof pollock. Using this approach, the Plan Team provided a 2017 ABC of 60,800 t and a 2018 ABC (at maxABC) of 97,428 t. This result was similar to the three-survey average method proposed by the authors in the SAFE and accepted by the Plan Team. With this revision, the recommended ABC and OFL levels for both AI and Bogoslof were accepted by NPFMC, and TACs of 19,000 t for AI and 500 t for Bogoslof were set by NOAA/NMFS for 2017.

[22] NOAA/NMFS 2017 GOA pollock TAC https://alaskafisheries.noaa.gov/node/55457

[23] SSC Report Dec 2016 http://npfmc.legistar.com/gateway.aspx?M=F&ID=2705c3ce-ed5a-4ab3-9936-4cf70912ee1c.pdf

Bogoslof

Quantity	As estimated or *specified last* year for: 2016	2017	As estimated or *recommended this* year for: 2017	2018
M (natural mortality rate)	0.3	0.3	0.3	0.3
Tier	5	5	5	5
Biomass (t)	106,000	106,000	434,760	434,760
F_{OFL}	0.300	0.300	0.300	0.300
$maxF_{ABC}$	0.225	0.225	0.225	0.225
F_{ABC}	0.225	0.225	0.12	0.12
OFL (t)	31,800	31,800	130,428	130,428
maxABC (t)	23,850	23,850	97,821	97,821
ABC (t)	23,850	23,850	51,300	51,300
Status	As determined *last* year for: 2014	2015	As determined *this* year for: 2015	2016
Overfishing	No	n/a	No	n/a

Aleutian Islands

Quantity	As estimated or *specified last* year for: 2016	2017	As estimated or *recommended this* year for: 2017	2018*
M (natural mortality rate)	0.18		0.19	
Tier	3b		3b	
Total (age 1+) biomass (t)	241,929	264,781	250,221	271,831
Female spawning biomass (t)				
Projected	74,377	79,693	77,579	81,545
$B_{100\%}$	206,962		203,100	
$B_{40\%}$	82,785		81,240	
$B_{35\%}$	72,437		71,085	
F_{OFL}	0.34	0.37	0.378	0.397
$maxF_{ABC}$	0.27	0.29	0.304	0.319
F_{ABC}	0.27	0.29	0.304	0.319
OFL (t)	39,075	44,455	43,650	49,291
maxABC (t)	32,227	36,664	36,061	40,788
ABC (t)	32,227	36,664	36,061	40,788
Status	As determined *this* year for: 2014	2015	As determined *this* year for: 2015	2016
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* Projection based on estimated catches of 1,500 t for 2016 and 1,157 t for 2017, the five-year average *F* (2010-2015) of 0.0087, used in place of maximum permissible ABC .

** Long-term equilibrium F_{OFL} and F_{ABC} were 0.417 and 0.332, respectively.

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 Alaskan pollock stocks.

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 Limits[24] (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 Species[25]

[24] 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 FMSY (or a proxy for F_{MSY})

[25] Prohibited Species are species that support traditional, near-shore Alaska fisheries. These species include Pacific halibut, Pacific herring, several species of salmon and large spider crabs in the BSAI management area. The bycatch of PSC species is to be avoided while fishing for

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).

The pollock fishery in the BSAI and GOA has evolved from a bottom trawl fishery into a very target selective, pelagic trawl fishery. The American Fisheries Act[26] significantly helped in this evolution by creating cooperatives within the BSAI pollock sector that only fish with pelagic trawls. This significantly reduced the bycatch of demersal species such as flatfish, cod, and crab. The AFA also limited pollock vessels in the BSAI from competing with GOA pollock vessels.

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

The National Marine Fisheries Service (NMFS)
NMFS (also known as NOAA fisheries) is responsible for the management, conservation, and protection of living marine resources within the US Exclusive Economic Zone (EEZ). The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nautical miles – nm), with responsibilities covering 842,000 nm^2 off Alaska. In addition to stock survey, stock assessment reports and biological studies related to the pollock 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 pollock fisheries in the Alaska's EEZ. NPFMC management measures for pollock include seasonal (i.e. season A and B) and spatial allocation of Total Allowable Catch (TAC), time (e.g. Chum Salmon Savings Area) and area restrictions (e.g. protected/conservation areas), bycatch reduction programs, 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)
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

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)

[26] The American Fisheries Act (AFA) 1998 - The purpose of the AFA was to tighten U.S. ownership standards that had been exploited under the Anti-reflagging Act, and to provide the Bering Sea and Aleutian Islands (BSAI) pollock fleet the opportunity to conduct their fishery in a more rational manner while protecting non-AFA participants in the other fisheries. The AFA established sector allocations in the BSAI pollock fishery, determined eligible vessels and processors, allowed the formation of cooperatives, set limits on the participation of AFA vessels in other fisheries, and imposed special catch weighing and monitoring requirements on AFA vessels https://alaskafisheries.noaa.gov/fisheries/AFA-pollock

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).

The Prince William Sound (PWS) pollock fishery takes place entirely within state waters and so is managed by ADFG and the BOF. Fisheries for pollock that overlap with state and federal waters take place in waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. In this instance, the state allows pollock to be fished against the federal TAC.

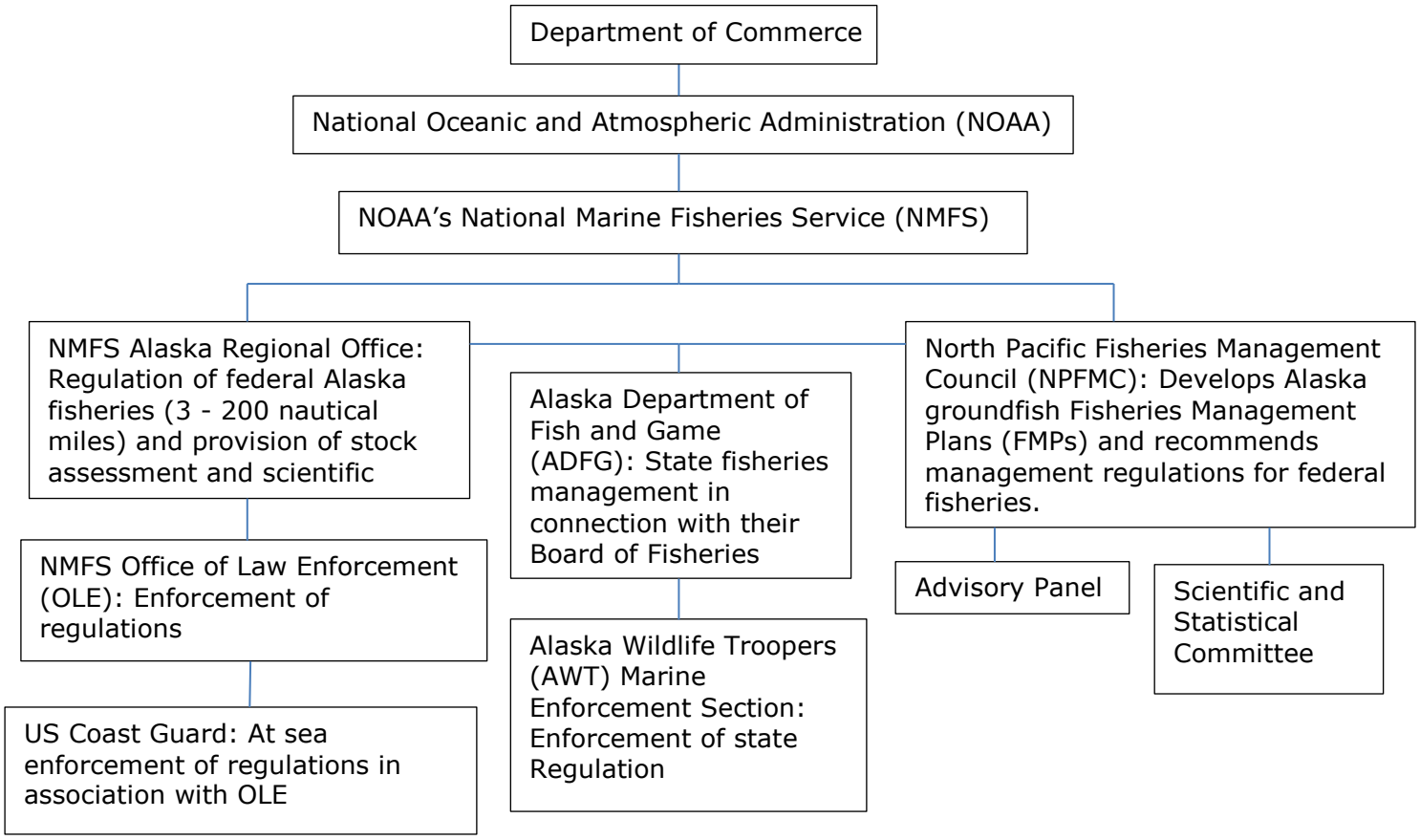


Fig. 3.6.1.1 The organisational structure for the management of the Alaska pollock fishery (adapted from original full - assessment report: Global Trust, 2011)

3.6.2 Establishment legislation

Federal

The principle legislative instrument for fisheries management in the US is the MSA (MSA 2007[27]). 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,

[27] http://www.nmfs.noaa.gov/sfa/laws_policies/msa/documents/msa_amended_2007.pdf

such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonable calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of privileges;

5. Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose;
6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches;
7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication;
8. Conservation and management measures shall, consistent with the conservation requirements of the Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities;
9. Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch; and,
10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

NMFS implements the MSA and the NSs. The procedures on how NMFS follows the NSs are published in the US Federal Register at 50 CFR Part 600 subpart D[28].
The MSA also establishes the NPFMC as one of eight regional councils to manage fisheries in the US EEZ.

State
State waters are fished under State of Alaska commercial fisheries regulations. The General Commercial Fisheries Regulations[29] establishes the basic regulations, i.e. those that give the ADFG and BOF the powers to regulate and manage the state fishery resource and describe the extent of their regulatory powers. Article 5, of the Commercial Groundfish Fisheries Regulations[30], defines the PWS pollock pelagic trawl fishery management plan. 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, 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 (0-3 nm from shore). Many fishery resources are harvested in waters under both state and federal jurisdiction. As such, the NPFMC and state work together to address habitat concerns, catch limits, allocation issues, and other management details through coordination meetings and delegation of management oversight to one agency or the other.

The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process[31] (NPFMC 2009) and the Council Operating Procedures[32] (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.

[28] https://www.law.cornell.edu/cfr/text/50/part-600/subpart-D
[29] http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/statutes_general_provisions_2013-2014.pdf
[30] http://www.adfg.alaska.gov/static/regulations/fishregulations/pdfs/commercial/2017_2018_cf_groundfish.pdf
[31] https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf
[32] https://www.npfmc.org/wp-content/PDFdocuments/membership/SOPPs412.pdf

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

The eleven voting members include:

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

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

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

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

The NPFMC appoints "Plan Teams" for each of the major FMPs. Members of each team are selected from those agencies and organizations having a role in the research and/or management of fisheries. The Plan Teams review stock assessment information and assist in the preparation of the annual Stock Assessment and Fishery Evaluation (SAFE) documents including formulation of recommendations on annual Acceptable Biological Catch (ABC) levels for groundfish, crab, and scallop species under the jurisdiction of the Council. The Plan Teams may also prepare and/or 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; 2014). All documents are posted on the website in advance of the meeting, and public comment is taken by the Council and advisory bodies before any decisions are made.

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

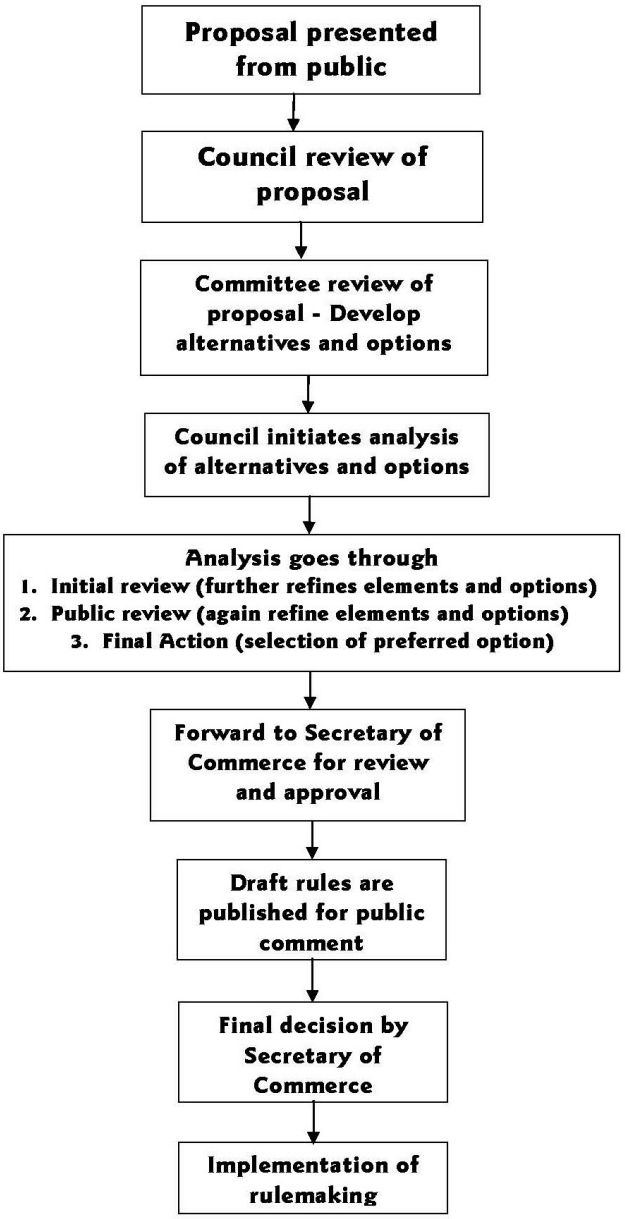


Fig. 3.6.3 Flow showing the process for regulatory change at the NPFMC (Source NPFMC 2009)

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 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).

Alaska Board of Fisheries (BOF)

The BOF[33] consists of seven members serving three-year terms. Members are appointed by the Governor and confirmed by the Legislature. Members are appointed on the basis of interest in public affairs, good judgment, knowledge, and ability in the field of action of the board, with a view to providing diversity of interest and points of view in the membership (see Alaska Statute 16.05.221[34]).

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

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

The BOF has the authority to adopt regulations described in AS 16.05.251[35] 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[36].

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.

[33] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
[34] http://www.touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section221.htm
[35] http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section251.htm
[36] http://www.touchngo.com/lglcntr/akstats/aac/title05.htm

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[37,38,39,40,41] 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 pollock and other fisheries, Working Groups/Committees, research, habitat protection, protected species, current issues, catch share, bycatch controls, regulations and more are available on the websites.

3.6.5 Surveillance and enforcement activities

Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE[42] and the USCG[43] (17th District USCG). The USCG also undertake inspections of fishing vessels and enforce mandatory safety of life and property at sea requirements for the fishing fleets. The AWT[44] fulfills the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

OLE protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679[45]]) and international agreements, e.g. combating Illegal, Unreported, Unregulated (IUU) fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia.

The OLE in Alaska[46] 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 report[47] and the Alaska region submits six monthly reports to the NPFMC (as an example see OLE 2017[48] - 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 pollock fishery (pers. comm. Nathan Lagerway).

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 600.740[49]) that details these "remedies for violations".

The USCG[50] is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District[51] covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of

[37] https://www.npfmc.org
[38] https://alaskafisheries.noaa.gov
[39] https://www.afsc.noaa.gov
[40] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
[41] http://www.adfg.alaska.gov/index.cfm?adfg=home.main
[42] http://www.nmfs.noaa.gov/ole/
[43] http://www.pacificarea.uscg.mil/Our-Organization/District-17/
[44] http://dps.alaska.gov/AWT/
[45] https://alaskafisheries.noaa.gov/fisheries-679regs
[46] http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html
[47] http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf
[48] https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C
[49] https://www.law.cornell.edu/cfr/text/50/600.740
[50] https://www.uscg.mil
[51] http://www.pacificarea.uscg.mil/Our-Organization/District-17/

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 webpage[52]) 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 pollock fishery.

The pollock fishery is considered to be a lower risk fishery, with the potential for salmon bycatch at certain times of the year being the main issue, however, voluntary compliance, i.e. recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue (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 "Donut Hole" agreement is the only area in the Central Bering Sea outside the Alaska EEZ where the pollock resource can be found. This area is subject to an international agreement with other member countries (i.e. Russia, Japan, Korea, etc.) and has been under a fishing moratorium since the mid 1990s. The Central Bering Sea Fisheries Enforcement Act prohibits vessels and nationals of the US from conducting fishing operations in the Central Bering Sea, except where such fishing operations are conducted in accordance with an international fishery agreement to which the US is a signatory. The USCG undertake aerial surveillance patrols and, if necessary, vessel patrols within this area.

The NPFMC Groundfish and Halibut Observer Program [53] (The Observer Program) is an important component of the monitoring of the pollock fishery. The program is the main data gathering program for all biological and fishery data that feed into pollock 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 category[54]. Vessels in the full coverage category include:

- catcher/processors
- motherships
- catcher vessels while participating in the BSAI 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. (NB Pollock are not targeted using these fishing methods)

[52] https://www.npfmc.org/committees/enforcement-committee/
[53] https://alaskafisheries.noaa.gov/fisheries/observer-program
[54] https://alaskafisheries.noaa.gov/sites/default/files/observer-prog-summary2016.pdf

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.

As a result, the vast majority of BSAI pollock fishing trips are observed, whereas, the observer coverage in the GoA is lower and more variable, in 2016 the coverage was approximately 20-25%[55].

The primary responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska lies with the Alaska Department of Public Safety[56], through its Division of Alaska Wildlife Troopers[57] (the division also enforces non-fisheries related regulations passed by the Board of Game). Biologists and other staff of the ADFG sometimes participate in enforcement activities and assist the Wildlife Troopers as needed. Some ADFG field staff have enforcement training and have powers of arrest[58]. 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 Alaska pollock 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 Purchases[59]) and the Alaska Administrative Code (5 AAC 39.130[60] Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements).

The NPMC have an established Enforcement Committee[61] charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea[62]. 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 BSAI and GOA Pacific cod (jig, pot, trawl, longline) fisheries and the flatfish fisheries (BSAI Amendment 80 fleet and GOA CV fleets) may interact with the pollock fishery 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 pollock fisheries include the:

- Halibut longline fleet/fishery;
- Sablefish longline fleet/fishery;
- BSAI crab fleet/fishery;
- Scallop fleet/fishery;
- BSAI and Goa rockfish fisheries;
- Salmon fishery – in as much as the pollock fishery can take salmon as a bycatch, in particular, Chinook and chum

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.

[55] https://alaskafisheries.noaa.gov/fisheries/observer-program-reports
[56] http://dps.alaska.gov
[57] http://dps.alaska.gov/AWT/
[58] http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main
[59] http://touchngo.com/lglcntr/akstats/Statutes/Title16/Chapter05/Section690.htm
[60] https://www.adfg.alaska.gov/static/license/fishing/pdfs/5aac39.pdf
[61] https://www.npfmc.org/committees/enforcement-committee/
[62] https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

With respect to salmon bycatch, since the mid-1990s, the Council and NMFS have developed and implemented a series of measures to minimize the incidental catch of Chinook and chum salmon in the pollock trawl fisheries[63,64]. These measures have primarily focused on closure areas and catch limits. Experience over time showed that the industry, working cooperatively, can more effectively avoid salmon bycatch by sharing data and using a system of short-term closure areas in areas where higher rates of salmon bycatch occur and using salmon bycatch excluders in pollock trawls.

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 and Gulf of Alaska has been extensively studied in terms of physical oceanography, ecosystem variability and fish 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 inter-annual variability in recruitment that appears more related to El Nino 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).

[63] https://www.npfmc.org/bsai-salmon-bycatch/

[64] https://www.npfmc.org/goa-salmon-bycatch/

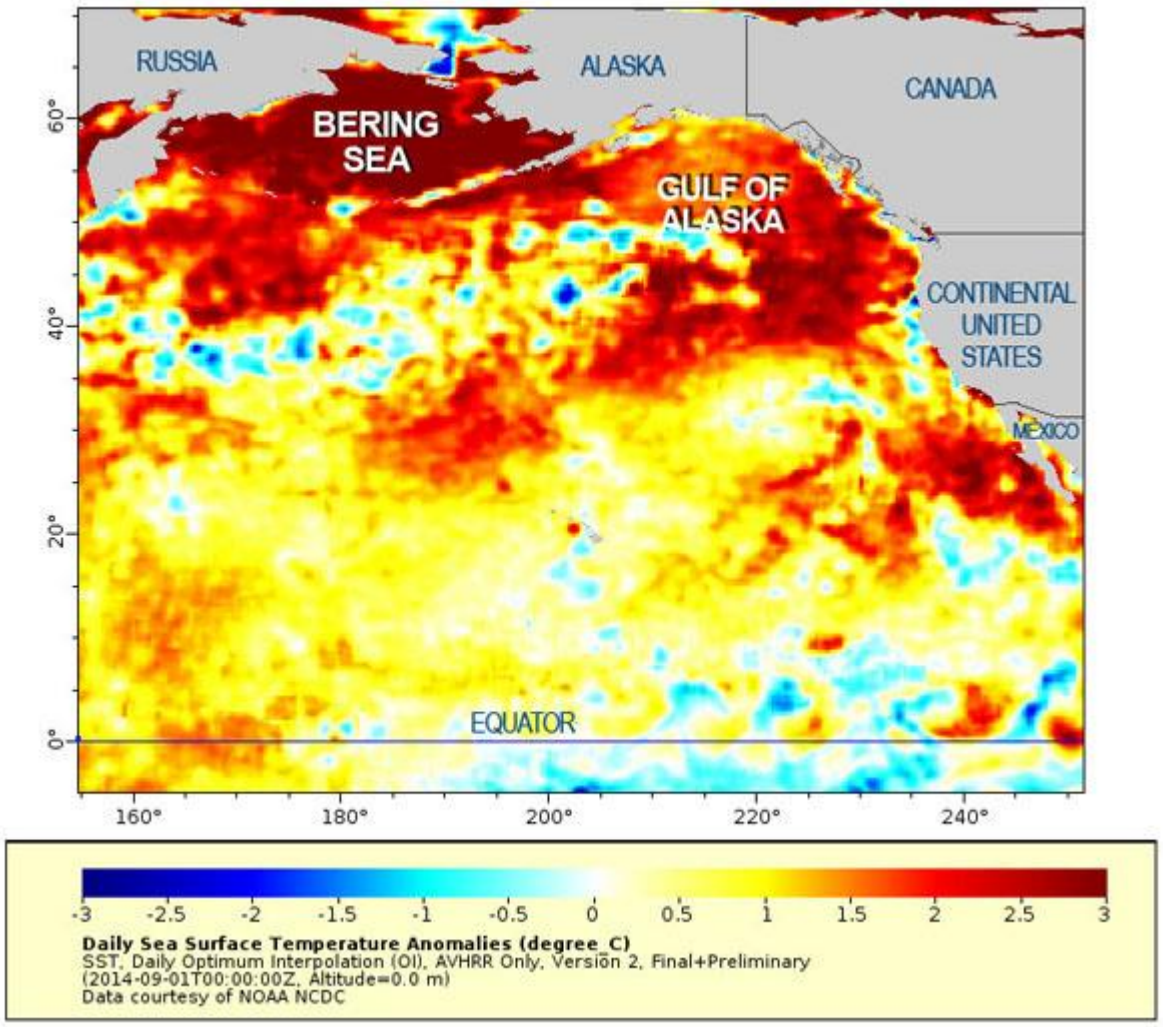


Fig. 3.9 Daily Sea Surface Temperature Anomalities (degree C)

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, beabird breeding indices and fur seal pups born at St Pauls
- 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 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 Pollock fisheries were first certified under the requirements of the Alaska Responsible Fisheries Management standard v1.2 on 6th of December 2011. The initial certification and four annual surveillance audits were carried out by the certification body Global Trust (GT).

18. November 2016, the certificate for this fishery was transferred from GT to the DNV GL and the validity of the Alaska Pollock certificate (Certificate No.:209971-2016-AQ-NOR-ASI) was extended from 6th December 2016 until 5th December 2017. This extension was done to allow the re-assessment to occur without the certificate expiring while the re-assessment process is on-going. In order to ensure that the client fishery stays in full compliance with the standard while the fishery is undergoing re-assessment, DNV GL carried out a remote desk-top review surveillance of the fishery. This review is considered as 5th annual surveillance audit. The certificate transfer and the fifth surveillance audit did not result in any changes in the compliance of the fishery with the RFM standard and the certificate remains valid until the extended expiry date of 5 December 2017. The fishery is currently undergoing 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 Seatlle, 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

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

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

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

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

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

Evaluation Parameters

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

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

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

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

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

Process:

The Magnuson- Stevens Fishery Conservation and Management Act[65] (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 Fisheries[66].

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, Auke Bay Marine Station (Juneau), Subport Dock Facility (Juneau), Little Port Walter Marine Station (Sitka), St. George Island Field Station and St Paul Island Field Station. NMFS enforcement offices are in Juneau (Alaska Headquarters), Anchorage, Dutch Harbour, Kodiak, Homer, Ketchikan, Petersburg, Seward and Sitka.

The North Pacific Fisheries Management Council[67] (NPFMC) is one of eight regional councils established by the MSA to manage fisheries in the US EEZ. The NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, fishery management plans (FMP) and any necessary amendments for each fishery under its authority that requires conservation and management actions. The NPFMC primarily manages groundfish in the BSAI[68] and GoA[69], targeting 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 constitution[70]. 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.[71]

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

Current status:
The NPFMC annually prepares and submits to the Secretary of Commerce for approval, fishery management plans (FMP) and any necessary amendments for each fishery under its authority that requires conservation and management actions. The NPFMC primarily manages groundfish in the BSAI[72] and GoA[73], targeting cod, pollock, flatfish, mackerel, sablefish, and rockfish species.

[65] http://www.nmfs.noaa.gov/sfa/laws_policies/msa/

[66] http://www.nmfs.noaa.gov/aboutus/our_mission.html

[67] https://www.npfmc.org

[68] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

[69] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

[70] http://ltgov.alaska.gov/services/alaskas-constitution/

[71] http://www.adfg.alaska.gov/index.cfm?adfg=about.structure

[72] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

[73] https://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

The NPFMC recommends regulations to govern the directed pollock fisheries in the Alaska EEZ. NPFMC management measures for pollock include seasonal (i.e. season A and B) and spatial allocation of Total Allowable Catch (TAC), time and area restrictions (i.e. protected / conservation areas), bycatch reduction programs, Prohibited Species Catch (PSC) Limits, reporting and observer requirements. 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.

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. The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nautical miles – nm).

The NMFS's Office for Law Enforcement (OLE) partners the U.S. Coast Guard in the monitoring, control and enforcement of fisheries regulations.

The OLE protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries within the EEZ [50 CFR 679[74]]) and international agreements, e.g. combating Illegal, Unreported, Unregulated (IUU) fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia, in line with the UN agreement to promote Compliance with international Conservation and Management Measures by Fishing Vessels on the High Seas.

The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District[75] covers the Alaska EEZ and is responsible for the largest amount of coastline and one of the largest areas of responsibility within the USCG. If the USCG detects a fisheries infringement they gather evidence and hand over the investigation to the OLE.

The NPFMC Groundfish and Halibut Observer Program[76] (The Observer Program) is an important component of the monitoring of the pollock fishery. The program is the main data gathering program for all biological and fishery data that feed into pollock stock assessment and management. While observers are not directly part of the federal Monitoring, Control and Surveillance 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.

As outlined in the current NPFMC Groundfish FMPs[77],[78] for BSAI and GOA, scientists from the AFSC, ADFG, other agencies, and universities prepare a Stock Assessment and Fishery Evaluation (SAFE) report annually. In addition to stock survey, stock assessment reports and biological studies related to the pollock fisheries, Guided by MSA standards, and other legal requirements, the NMFS also has a well-established institutional framework for research and stock assessment developed within the AFSC. The AFSC conducts annual bottom trawl surveys and biennial acoustic trawl surveys to assess pollock abundance in the Eastern Bering Sea. In the GOA, the AFSC conducts biennial trawl surveys to assess pollock abundance; and a yearly Shelikof Strait Echo Integration Trawl (EIT) Survey. In addition to biological studies, stock survey and stock assessment reports. 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.

State waters are fished under State of Alaska commercial fisheries regulations. The General Commercial Fisheries Regulations[79] 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 ADFG and the BOF manage the Prince William Sound (PWS) pollock fishery using a Guideline Harvest Level (GHL) strategy and supporting regulations. The ADFG has

[74] https://alaskafisheries.noaa.gov/fisheries-679regs

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

[76] https://alaskafisheries.noaa.gov/fisheries/observer-program

[77] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

[78] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf

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

established a PWS pollock trawl fishery management plan to reduce potential impacts on the endangered population of Steller sea lions by geographically apportioning the catch. Parallel fisheries (where state allows federal species TAC to be harvested in 0-3 nm waters) for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. The state can adopt regulations similar to those in place for the Federal fishery if those regulations are approved by the BOF and meet state statute. Enforcement of state waters regulations is provided by the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT). AWT conduct at-sea and shore-based inspections and collate and present evidence of breeches in regulations.

Appropriateness/Effectiveness
The Alaska pollock fisheries are the highest volume fisheries in the US. The stock assessments are state-of-the-art, single species models that take account of all sources of fishing mortality on the pollock stocks. Considerable resources in the form of stock assessment, ecosystem monitoring and management expertise and capacity; management organisations and structures, e.g. NMFS Alaska region, NPFMC, OLE, USCG, Observe Program, are dedicated to the main fisheries in Alaskan federal waters. National legislation and the regulatory process by which NPFMC and NMFS are directed and follow, enable the management of the resource at a regional and more localised level. The adaptive and consultative management approach adopted by the NPFMC actively promotes stakeholder participation. The NOAA Office of General Council[80] (OGC) reviews any proposed management action to assure compliance with the MSA. International obligations, e.g. combating IUU, and the enforcement of federal regulations are upheld by the federal departments such as USCG and OLE. The ability to enforce relevant rules and regulations is demonstrated by extensive patrols showing very low violation rates[81]

Within state waters, the pollock fishery is undertaken on a much smaller scale and supported by area specific stock assessment surveys as well as shared information from federal assessments. Technical expertise is available in-house and supported through the participation in and with groups established by the NPFMC. The BOF provides a consultative management approach that offers and takes account of stakeholder input. The AWT[82] input into the development of regulations and are responsible for their enforcement at-sea and ashore.

During the site visit no evidence was found or provided to indicate the management system is subject to continual unresolved or repeated disputes or political instability.

It is considered that, in combination, the federal and state management framework for the Alaska pollock fisheries are appropriate for managing the resource.

Evidence basis:
The respective websites for, NMFS[66] (NOAA fisheries), NPFMC[67], and ADFG71 and annual FMPs for BSAI[68] and GoA[69] groundfish, also available on the NPFMC website.

Conclusion:

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

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

[80] http://www.gc.noaa.gov
[81] https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C
[82] http://dps.alaska.gov/AWT/Marine-(1)/Marine

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

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

17th US Coast Guard District http://www.pacificarea.uscg.mil/Our-Organization/District-17/

OLE Alaska region six monthly reports to the NPFMC https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C

Alaska Wildlife Troopers http://dps.alaska.gov/AWT/Marine-(1)/Marine

The NOAA Office of general Counsel http://www.gc.noaa.gov

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:
Pollock are widely distributed in the North Pacific and are particularly prevalent in the Bering Sea[83]. The biological characteristics of pollock are well known. There are numerous sources of information on pollock biology, including the Stock Assessment and Fishery Evaluation (SAFE)[84,85] reports prepared annually by scientists from AFSC, ADFG and other agencies and universities. The AFSC website provides summaries for pollock biology and relevant studies[86] under various headings. (Also see section 3.2 of this report).

In the GOA, pollock are considered to be a single stock separate from those in the BSAI. The separation of pollock in Alaskan waters into BSAI and GoA stocks is supported by analysis of larval drift patterns from spawning locations, as well as genetic/DNA[10] (Bailey et al, 1999; Mulligan et al 1992, Grant and Utter, 1980).

The biological unity and other biological characteristics of the stock are considered within the management system. In the US Bering Sea, three pollock stocks[87] have been identified (Fig. 3.1.2): and are managed within the framework of the NPFMCs BSAI Groundfish FMP[4]. Eastern Bering Sea (EBS) pollock occupying the eastern Bering Sea shelf from Unimak Pass to the US/Russia Convention line; Aleutian Islands (AI) pollock encompassing the pollock in the Aleutian Islands shelf region from 170°W to the US/Russia Convention line (Fig. 3.1.3); and the Central Bering Sea-Bogoslof Island (CBS-BI) pollock[10]. These three management stocks likely have some degree of exchange. The Bogoslof stock is thought to form a distinct spawning aggregation that has some connection with the deep-water region of the Central Bering Sea/Aleutian Basin.

There is seasonal and inter-annual variation in both area and patchiness of pollock distribution, along with general preference for waters between 2° and 3° C. In late winter/early spring, pollock form very large spawning aggregations in both the EBS and GOA Regions, in areas such as Shelikof Strait (west side of Kodiak Island) and northwest of Unimak Island (Fig. 3.1.1). In summer, large aggregations have been found in GOA areas such as the east side of Kodiak Island, and nearshore along the southern Alaska Peninsula, and in EBS areas such as west of the Pribilof Islands and north of Unimak Island. Pollock migrate seasonally between spawning and feeding areas, and fishing is divided into seasons in the BSAI and GOA management areas.

[83] http://www.fishwatch.gov/profiles/alaska-pollock
[84] https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf
[85] https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf
[86] https://www.afsc.noaa.gov/species/pollock.php
[87] https://www.afsc.noaa.gov/refm/stocks/assessments.htm

The three management stocks of pollock within the BSAI area occur largely within the Alaska EEZ, but some migration of pollock to the northwest results in a very small proportion of the Eastern Bering Sea pollock stock being found in the Cape Navarin area of Russia (Fig. 3.1.3). Acoustic research surveys which covered both US and Russian waters, estimated that the Alaskan EEZ contained more than 99% of the pollock stock. In the Russian portion of the Bering Sea, two pollock stocks are identified, a western Bering Sea stock and a northern stock. There is some indication (based on NMFS surveys) that the fish in the northern region may be a mixture of western and EBS pollock.

The US and Russia cooperate through a bilateral Intergovernmental Consultative Committee (ICC) fisheries forum[88], established following the signing of the US - Soviet Comprehensive Fisheries Agreement in 1988[89]. The objectives of the Agreement include maintaining a mutually beneficial and equitable fisheries relationship through cooperative scientific research and exchanges[90]. Cooperation has included US and Russian scientist undertaking occasional acoustic surveys with US vessels in Russian waters.

Pollock are also found in international waters where no country has single jurisdiction. The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea[91] ('The Donut Hole') is responsible for the conservation, management, and optimum utilisation of pollock resources in the high seas area of the Bering Sea. The pollock resource in the Convention Area declined to very low levels by the early 1990s. Member states (China, Japan, Korea, Poland, Russia, and the United States) have maintained a moratorium on commercial pollock fishing in the Convention Area since 1993 in an effort to allow the stock to rebuild. Despite the moratorium, pollock abundance in international areas remains at low levels.

Within PWS, i.e. state waters, there is a directed pollock fishery, it is the only pollock fishery that is prosecuted entirely inside state waters. The ADFG have a pollock management plan (5 ACC 28.263)[92] which is based on NMFS/AFSC trawl surveys[93] and setting their own Guideline Harvest Level (GHL) as a percentage of the federal Allowable Biological Catch (ABC) for GOA pollock.

Effectiveness:
The EBS and GOA pollock stocks are assessed independently using statistical age structured assessment models and take into account all sources of fishing mortality and are based on complete catch reporting systems including extensive observer data[9,10]. Catch at age models synthesize data on biomass and age composition from the fishery, bottom trawl, and echo integrated trawl surveys conducted by the AFSC to estimate the numbers of pollock at age. Each year several assessment models are developed and evaluated by scientists using alternative life history and fishery & survey selectivity assumptions. Additionally, for the EBS and GOA models exploring stock status in relation to changing environmental conditions have also been developed and evaluated. Each model uses information on the status of the stock and potential effects of current management practices. The stock assessments consider the migration and possible removal of pollock in Russian waters using sensitivity analyses and treat this component as additional mortality. (See section 3.3 of this report for further information).

Evidence Basis:
The separation of pollock in Alaskan waters into BSAI and GoA stocks is supported by analysis of larval drift patterns from spawning locations, as well as genetic/DNA[10] (Bailey et al, 1999; Mulligan et al 1992, Grant and Utter, 1980).

The NMFS/AFSC website has detailed information on Alaskan pollock research and stock assessment[94]. The SAFE reports (see Section 3.3 above for details and references to the four pollock SAFE documents for 2016) are compiled annually by the BSAI and GOA Groundfish Plan Teams,

88 https://www.state.gov/e/oes/ocns/fish/bilateral/
89 http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf
90 http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/us_russia.html
91 https://www.afsc.noaa.gov/refm/cbs/convention_description.htm
92 http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm
93 http://www.adfg.alaska.gov/fedaidpdfs/fmr14-42.pdf
94 https://www.afsc.noaa.gov/species/pollock.php

which are appointed by the NPFMC. As outlined in the current NPFMC Groundfish FMPs[95],[96] for BSAI and GOA, scientists from the AFSC, ADFG, other agencies, and universities prepare a Stock Assessment and Fishery Evaluation (SAFE) report annually. Results of the US acoustic surveys for pollock in Russian waters are considered as part of the annual stock assessment process as appropriate, e.g. in the 2009 BSAI Groundfish Plan Team Report[97].

Data on catches of Alaskan pollock are maintained and updated by NMFS and are available on their website[98]. The SAFE documents[99,100,101,102] for the 4 federal-waters pollock stock components contain extensive details on the catch and other data time series used in the stock assessments, including the catches from the PWS pollock fishery.

Conclusion:

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

References:

Fishwatch website http://www.fishwatch.gov/profiles/alaska-pollock

BSAI Pollock SAFE Report https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

GOA Pollock SAFE Report https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

Alaska Fisheries Science Centre, pollock species profile
https://www.afsc.noaa.gov/species/pollock.php

Alaska Fisheries Science Centre, Groundfish stock assessments
https://www.afsc.noaa.gov/refm/stocks/assessments.htm

Bailey, K. M., Quinn, T. J., Bentzen, P., & Grant, W. S. (1999). Population structure and dynamics of walleye pollock, Theragra chalcogramma. Advances in Marine Biology, 37, 179 – 255.

Grant WS, Utter FM (1980) Biochemical genetic variation in walleye pollock, Theragra chalcogramma: population structure in the southeastern Bering Sea and the Gulf of Alaska. Canadian Journal of Fisheries and Aquatic Sciences, 37, 1093-1100.

Mulligan TJ, Chapman RW, Brown BL (1992) Mitochondrial DNA analysis of walleye pollock, Theragra chalcogramma, from the Eastern Bering Sea and Shelikof Strait, Gulf of Alaska. Canadian Journal of Fisheries and Aquatic Sciences, 49, 319-326.

Intergovernmental Consultative Committee (ICC) https://www.state.gov/e/oes/ocns/fish/bilateral/

US - Soviet Comprehensive Fisheries Agreement in 1988
http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf

US – Soviet Agreement cooperative scientific research and exchanges
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/us_russia.html

The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea
https://www.afsc.noaa.gov/refm/cbs/convention_description.htm

ADFG Prince William Sound pollock management plan (5 ACC 28.263)
http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

NMFS/AFSC trawl surveys http://www.adfg.alaska.gov/fedaidpdfs/fmr14-42.pdf

[95] http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf
[96] https://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[97] https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf
[98] https://alaskafisheries.noaa.gov/fisheries-catch-landings
[99] http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf
[100] http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf
[101] http://www.afsc.noaa.gov/REFM/Docs/2016/BOGpollock.pdf
[102] http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

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

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

EBS pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

AI pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf

Bogoslof pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/BOGpollock.pdf

GOA pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.3.1

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

Evaluation Parameters

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

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

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

Evidence Basis: Documentary evidence is available supporting the above.

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

Process:

The NPFMC commits to: periodically review all critical components of the FMP and maintain a continuing review of the fisheries managed under their FMPs; annually review objectives in the management policy statement; and, conduct a complete review of 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 [84,85].

The NPFMC and BOF hold public meetings (the Council meets five times each year[103], usually in February, April, June, October and December; the BOF meetings generally occur from October through March, four to six times per year[104]). 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 pollock fishery. In this way, previously agreed measures are reviewed.

Current Status/Appropriateness/Effectiveness:
The Alaska pollock fishery management system (NMFS/NPFMC and ADFG/BOF) routinely takes into account all previously-agreed management measures. For example, The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea ('The Donut Hole) responsible for the conservation, management, and optimum utilization of pollock resources in the high seas area of the Bering Sea maintained a moratorium on commercial pollock fishing in the Convention Area since 1993 in an effort to allow the stock to rebuild.
Despite the moratorium, pollock abundance in international areas remains at low levels. The U.S. continues to promote and support these international conservation measures.

NMFS and the NPFMC have changed management of Atka mackerel and pollock fisheries in the BSAI and GOA. These changes were designed to reduce the possibility of competitive interactions between fisheries and Steller sea lions. Consequently, management measures redistributed the fishery both temporally and spatially according to pollock biomass distributions. Three types of measures were implemented in the pollock fisheries: 1) pollock fishery exclusion zones around sea lion rookery or haulout sites; 2) phased-in reductions in the seasonal proportions of TAC that can be taken from critical habitat; and 3) additional seasonal TAC releases to disperse the fishery in time.

Closed areas for Steller sea lion protection have been not only been maintained through the years, but increased.

The fishery continues to respond to issues related to salmon bycatch[105,106], for example, annual prohibited species catch (PSC) limits for chinook are in place as are Incentive Plan Agreements (IPAs) that provide incentive to avoid chum salmon bycatch. A total of 32,560 Chinook salmon and 347,138 non-Chinook salmon (i.e., chum salmon) were taken as bycatch in the Bering Sea groundfish fisheries in 2016. 100 % monitoring by observers allows for an accurate estimate of salmon bycatch. Since the mid-1990s, the Council and NMFS have developed and implemented a series of measures to minimize the incidental catch of Chinook and chum salmon in the groundfish trawl fisheries. These measures have primarily focused on closure areas and catch limits. Experience over time showed that the industry, working cooperatively, can more effectively avoid salmon bycatch by sharing data and using a system of short term closure areas in areas where higher rates of salmon bycatch occur (for example, the adjacent figure shows the closures that were established to avoid chum salmon in 2015), and using salmon bycatch excluders in pollock trawls.

Many other examples exist that show the continued implementation of previously agreed regulations (and improvement) for pollock management as needed within the Alaska EEZ.

Evidence Basis:
The NPFMC FMPs (Table ES-2)[68,69] 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[103,107,108]. Similarly, the BOF websites have dedicated pages to their public meetings and agendas and outcomes reflect a commitment to review previously agreed management measures[104,109].

Conclusion:

[103] https://www.npfmc.org/upcoming-council-meetings/
[104] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo
[105] https://www.npfmc.org/bsai-salmon-bycatch/
[106] https://www.npfmc.org/goa-salmon-bycatch/
[107] https://www.npfmc.org/council-meeting-archive/
[108] https://www.npfmc.org/wp-content/PDFdocuments/meetings/threemeetingoutlook.pdf
[109] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main

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

References:

NOAA website catch and landing reports https://alaskafisheries.noaa.gov/fisheries-catch-landings

EBS pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

AI pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf

Bogoslof pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/BOGpollock.pdf

GOA pollock SAFE document http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.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 BSAI https://www.npfmc.org/bsai-salmon-bycatch/

NPFMC salmon bycatch in GOA https://www.npfmc.org/goa-salmon-bycatch/

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

Non-Conformance Number (if relevant):

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

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

Evaluation Parameters

Note: This clause qualifies only if stock is either transboundary, straddling, highly migratory, or high seas. If not, this clause is NOT APPLICABLE. This clause is justified by the evidence provided in clause 1.2. Where sub-stocks are referred to as part of an overall stock there shall be sufficient information on biology, distribution, and life cycle that demonstrates the degree of association or disassociation, and basis for the management approach taken, to prevent recruitment failure of the stock or other negative impacts that are likely to be irreversible or very slowly reversible.
Process: There is a mechanism in place by which the applicant organization(s) cooperates for the management of the transboundary stock. This mechanism has the sustainable international exploitation of the stock as its main objective.
Current Status/Appropriateness/Effectiveness: There is evidence that the mechanism described in the process parameter is effective at ensuring the stock is sustainably exploited. This can take the form of evidence that the stock is not overfished or subject to overfishing across the entirety of the range of the biological stock.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include proof of formal agreements, records of meetings and decisions.

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

Process:
The US and Russia cooperate through a bilateral Intergovernmental Consultative Committee (ICC) fisheries forum[110], established following the signing of the US - Soviet Comprehensive Fisheries Agreement in 1988[111].

The purpose of the Agreement is to establish a common understanding of the principles and procedures to provide for cooperation between the Parties in areas of mutual interest concerning fisheries.

The objectives of the Agreement include maintaining a mutually beneficial and equitable fisheries relationship through cooperative scientific research and exchanges; reciprocal allocation of surplus fish within the respective 200-mile EEZs, consistent with national laws; cooperation and the establishment of joint fishing ventures; general consultations on fisheries matters of mutual concern; and cooperation to address illegal fishing on the high seas of the North Pacific and the Bering Sea.

While the agreement does not explicitly include sustainability of the shared stock as its main objective it does refer to the mutual application of respective national laws and international obligations to which they are signatories. In so doing, there is an implicit commitment to sustainability of the resource.

The ICC meets on an annual basis[112] to coordinate bilateral fisheries science and enforcement issues. This has included joint research on pollock on both sides of the transboundary area of the northern Bering Sea.

Pollock are also found in international waters where no country has single jurisdiction. The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea[113] ('The Donut Hole') is responsible for the conservation, management, and optimum utilisation of pollock resources in the high seas area of the Bering Sea.

The objectives of the convention are:
- To establish and international regime for conservation management, and optimum utilisation of pollock resources in the Convention Area;
- To restore and maintain the pollock resources in the Bering Sea at levels which will permit maximum sustainable yield;
- To cooperate in the gathering and examining of factual information concerning pollock and other living marine resources in the Bering Sea; and
- To provide, if the Parties agree, a forum in which to consider the establishment of necessary conservation and management measure for living marine resources other than pollock in the Convention Area as may be required in the future.

110 https://www.state.gov/e/oes/ocns/fish/bilateral/
111 http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf
112 http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf
113 https://www.afsc.noaa.gov/refm/cbs/convention_description.htm

The Convention directs the Annual Conference of the Parties to establish by consensus the pollock Allowable Harvest Level (AHL) for the central Bering Sea for the succeeding year, based on the assessment of the total Aleutian Basin pollock biomass by its own Science and Technical Committee.

The Convention allows the coastal states, i.e. the US and Russia, to establish the pollock AHL based on the best available scientific data. If the coastal states have insufficient data to establish the biomass, an annex to the Convention contains a default mechanism that deems the pollock biomass of the "Specific Area" (a subset of the Bogoslof Island pollock spawning grounds in the U.S. zone) to represent 60 percent of the Aleutian Basin pollock biomass. If the extrapolated estimate of the total Aleutian Basin pollock biomass is less than 1.67 million metric tons, the AHL is set at zero and there is no directed fishing for pollock in the central Bering Sea for the succeeding year.

The pollock resource in the Convention Area declined to very low levels by the early 1990s and has not reached the 1.67 million metric ton biomass level. Therefore, Member states have maintained a moratorium on commercial pollock fishing in the Convention Area since 1993.

Current Status/Appropriateness/Effectiveness:
Results of the US acoustic surveys for pollock in Russian waters are considered as part of the annual stock assessment process as appropriate, e.g. in the 2009 BSAI Groundfish Plan Team Report[114].

The EBS pollock stock assessment indicates that the stock is not overfished and overfishing is not taking place. The stock assessments consider the migration and possible removal of pollock in Russian waters using sensitivity analyses and treat this component as additional mortality.

Evidence Basis:
The ICC meets alternatively in the US and Russia on an annual basis, at the discretion of the heads of delegation, as highlighted on the AFSC website[112]. The US - Soviet Comprehensive Fisheries Agreement, 1988, is published on the internet[111].

Annual meetings of Member States of 'the Donut Hole' Convention have taken place, since 2010, these have been virtual conferences[115]. The minutes and supporting documents are published by NOAA[116].

This clause is also justified by the evidence provided in clause 1.2.

Conclusion:

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

References:
Intergovernmental Consultative Committee (ICC) https://www.state.gov/e/oes/ocns/fish/bilateral/

US - Soviet Comprehensive Fisheries Agreement in 1988
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf

ICC meeting arrangements
http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf

[1]The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea https://www.afsc.noaa.gov/refm/cbs/convention_description.htm

[114] https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf
[115] https://www.afsc.noaa.gov/REFM/CBS/Default.htm
[116] https://www.afsc.noaa.gov/REFM/CBS/20th_annual_conference.htm

BSAI Groundfish Plan Team Report 2009 https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf
Non-Conformance Number (if relevant):

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

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

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

Evaluation Parameters

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

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

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

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

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

Process:

The US and Russia cooperate through the ICC, and the Donut Hole Convention provides the forum for Member States to discuss and agree on management of the pollock fishery in international waters. This is detailed in 1.2 and 1.3 above.

The (ICC) fisheries forum[117] was established following the signing of the US - Soviet Comprehensive Fisheries Agreement in 1988[118]. The purpose of the Agreement is to establish a common understanding of the principles and procedures to provide for cooperation between the Parties in areas of mutual interest concerning fisheries. The objectives of the Agreement include maintaining a mutually beneficial and equitable fisheries relationship through cooperative scientific research and exchanges; reciprocal allocation of surplus fish within the respective 200-mile EEZs, consistent with

[117] https://www.state.gov/e/oes/ocns/fish/bilateral/

[118] http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf

national laws; cooperation and the establishment of joint fishing ventures; general consultations on fisheries matters of mutual concern; and cooperation to address illegal fishing on the high seas of the North Pacific and the Bering Sea.

While the agreement does not explicitly include sustainability of the shared stock as its main objective it does refer to the mutual application of respective national laws and international obligations to which they are signatories. In so doing, there is an implicit commitment to sustainability of the resource.

Furthermore, NOAA and the Federal Agency for Fisheries of the Russian Federation signed a Joint Statement on Enhanced Fisheries Cooperation (April 29, 2013)[119]. This document identifies three major areas of cooperation: 1) combating global Illegal Unreported and Unregulated (IUU) fishing; 2) collaborating on science and management of Arctic Ocean living marine resources; and 3) advancing conservation efforts in the Ross Sea region of Antarctica.

Current Status/Appropriateness/Effectiveness:
The US and Russia work together on gathering and sharing information and monitoring the fishery. In so doing, this contributes to the maintenance of the EBS stock well within sustainable levels.

Evidence Basis:
The ICC meets on an annual basis[120] to coordinate bilateral fisheries science and enforcement issues. This has included joint research on pollock on both sides of the transboundary area of the northern Bering Sea.

Results of the US acoustic surveys for pollock in Russian waters are considered as part of the annual stock assessment process as appropriate, e.g. in the 2009 BSAI Groundfish Plan Team Report[121].

The ICC meets alternatively in the US and Russia on an annual basis, at the discretion of the heads of delegation, as highlighted on the AFSC website[112].

Annual meetings of Member States of 'the Donut Hole' Convention have taken place, since 2010, these have been virtual conferences[122]. The minutes and supporting documents are published by NOAA[123].

Conclusion:

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

References:
US - Russian Federation Joint Statement on Enhanced Fisheries Cooperation (April 29, 2013)
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/statement_signed.pdf

BSAI Groundfish Plan Team Report 2009
https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf

Annual meetings of Member States of 'the Donut Hole' Convention
https://www.afsc.noaa.gov/REFM/CBS/20th_annual_conference.htm

Annual meetings of the Intergovernmental Consultative Committee (ICC)
http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf

US - Soviet Comprehensive Fisheries Agreement in 1988
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf

[119] http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/statement_signed.pdf
[120] http://www.fisheries.noaa.gov/ia/agreements/bilateral_arrangements/russia/us_russia.pdf
[121] https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf
[122] https://www.afsc.noaa.gov/REFM/CBS/Default.htm
[123] https://www.afsc.noaa.gov/REFM/CBS/20th_annual_conference.htm

Non-Conformance Number (if relevant):

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

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

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

Process; Current Status/Appropriateness/Effectiveness; Evidence Basis:
The US and Russia cooperate through the ICC as detailed in 1.2 and 1.3 above.

Cooperation between Member States of the 'Donut Hole' Convention is detailed in 1.2 and 1.3 above.

Conclusion:

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

References:

See sections 1.2 and 1.3 above

Non-Conformance Number (if relevant):

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

FAO CCRF 7.3.5

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

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

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

Process; Current Status/Appropriateness/Effectiveness; Evidence Basis:
The US and Russia cooperate and consult through the ICC as detailed in 1.2 and 1.3 above.

Cooperation and consultation between Member States of the 'Donut Hole' Convention takes place at annual meetings. These are detailed in 1.2 and 1.3 above.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: See sections 1.2 and 1.3 above				
Non-Conformance Number (if relevant):				

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

***FAO CCRF* 7.3.4**

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

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

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

Process:
The US and Russia have routinely allowed scientists from the other country onboard research vessels[124] and work through the ICC with respect to management and fisheries development. At the site visit the assessment team heard that a Russian scientist was working with AFSC staff as part of the US / Russia commitment to cooperation with respect to fisheries research and information exchange (Ianelli, pers. comm.).

Current Status/Appropriateness/Effectiveness:
The US and Russia meet annually through the ICC and with other Member States who are signatories to the 'Donut Hole' Convention.

Evidence basis:
This clause is justified by evidence provided in 1.2, 1.3 and 1.4.

Conclusion:

[124] https://data.noaa.gov/dataset/acoustic-trawl-survey-of-walleye-pollock-on-the-u-s-and-russian-bering-sea-shelf-dy1207-ek60

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

References:
US and Russia joint research initiative
https://data.noaa.gov/dataset/acoustic-trawl-survey-of-walleye-pollock-on-the-u-s-and-russian-bering-sea-shelf-dy1207-ek60

Annual meetings of Member States of 'the Donut Hole' Convention
https://www.afsc.noaa.gov/REFM/CBS/20th_annual_conference.htm

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 cycle[125] can be summarised in the following steps:

1. Office of Management and Budget (OMB)[126] issues budget guidance NMFS submits its budget
2. Department of Commerce (DOC) and NOAA issue budget guidance
3. NMFS submits its budget to NOAA
4. NOAA submits it budget to DOC
5. DOC submits its budget to OMB
6. President's budget delivered to Congress
7. NOAA and DOC discuss the proposed budget with Congress
8. Deliberations by congressional appropriations committees
9. Budget execution
10. Spending and performance information sent to OMB – back to step 1

The state budget cycle[127] 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

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

Current Status/ Appropriateness/Effectiveness:

The following is adapted from "American Fisheries Act Program Cost Recovery for Fishing Year 2016[128]":

On January 5, 2016, NMFS published a final rule to implement cost recovery for the AFA program. The AFA allocates the Bering Sea directed pollock fishery TAC to three sectors – inshore, catcher/processor, and mothership. Each sector has established cooperatives to harvest the sector's pollock allocation. These cooperatives are responsible for paying the fee for Bering Sea pollock landed under the AFA, due on December 31 of the year in which the landings were made. Cost recovery requirements for the AFA sectors are at 50 CFR 679.66. The total dollar amount of the fee due is determined by multiplying the NMFS published fee percentage by the ex-vessel value of all

[125] http://www.fisheries.noaa.gov/sfa/management/councils/ccc/2017/feb/tab2-budget-update-acc.pdf
[126] https://www.whitehouse.gov/omb
[127] http://akleg.gov/docs/pdf/budgproc.pdf
[128] https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.pdf

landings under the program made during the fishing year. NMFS determines the fee percentage that applies to landings made during the year by dividing the direct program costs by the fishery value.

The current groundfish observer program is a further example of management being financially supported through cost recovery. A 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.

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)[68,69]. Owing to the multifunctional role that many of the management organisations have, obtaining a precise figure for the expenditure on specific fisheries in the BSAI and GOA is not possible, however, estimates are provided for the cost of fishery management by the government agencies, e.g.

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

The American Fisheries Act Program Cost Recovery for Fishing Year 2016 details direct program costs of $366,688, i.e. costs that would not have been incurred but for the three identified pollock sectors - inshore, catcher/processor, mothership. As a result, cost recovery fees are charged to the cooperatives representing each sector at 0.10%, 0.10% and 0.17%, respectively, of their reported landings. If an account is unpaid for 30 days after the due date, administrative fees, interest, and penalties start to accrue. NMFS may take action against the cooperative's AFA pollock allocation and assess additional monetary charges, fines, or permit sanctions. If after 120 days the fee remains unpaid, the unpaid balance is forwarded to the U.S. Department of the Treasury for collection.

The budget for observer deployment in 2015[129] 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.

Despite the minimal ADFG management costs directly related to the pollock fishery, the BSAI and GOA pollock fishery participants pay a 3% resource landings tax based on unprocessed value of the fish caught, directly to the State of Alaska general tax fund[130] in addition to a 0.5% seafood marketing tax that pays for a budget provided to the Alaska Seafood Marketing Institute.

There is no budget *per se*, for work associated with the international collaboration mentioned in 1.2 and 1.3 above. The travel costs associated with this international collaboration are generally paid for by the employers of those appointed as committee members. Any additional work required as a

[129] https://alaskafisheries.noaa.gov/sites/default/files/2015observerprogramannualreport.pdf
[130] http://www.tax.alaska.gov/programs/programs/index.aspx?60620

result of the committee meetings is funded by the governments of Russia and the US, but essentially the committee meets and shares information on work already completed as opposed to constructing additional work (Austin Estabrooks, pers. comm. October, 2017).

Conclusion:

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

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/GOAfmp.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

NOAA Cost Recovery Fee Program – Alaska region - https://alaskafisheries.noaa.gov/fisheries/cost-recovery-fee-programs

American Fisheries Act Program Cost Recovery for Fishing Year 2016 https://alaskafisheries.noaa.gov/sites/default/files/reports/afacr_fee_rpt2016.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)**
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	The State **insufficiently** encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing vessels or fishing	The State only **moderately** encourages banks and financial institutions not to require, as a condition of a loan or mortgage, fishing	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

jurisdiction other than that of the State of beneficial ownership. **Lacking in all parameters.**	support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership. **Lacking in two parameters.**	vessels or fishing support vessels to be flagged in a jurisdiction other than that of the State of beneficial ownership. **Lacking in one parameter.**	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. **Fulfils all parameters.**

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

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

Process; Current Status/Appropriateness/Effectiveness; Evidence Basis
The Alaska pollock fishery does not operate outside of the EEZ and all vessels operating in the fishery must be US owned and licenced[131]. This supporting clause is therefore not applicable.

Conclusion: NOT APPLICABLE

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

References:
Non-Conformance Number (if relevant):

1.7 Procedures shall be in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information.
- Review procedures shall be established within the management system.
- A mechanism for revision of management measures shall exist**.**

FAO CCRF 7.6.8

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** procedures in place to	There are **insufficiently**	There are **moderately** effective	Procedures are in place to keep the efficacy of

[131] https://alaskafisheries.noaa.gov/fisheries/AFA-pollock

review the efficiency of current conservation and management measures. **Lacking in all parameters.**	effective procedures in place to review the efficiency of current conservation and management measures. **Lacking in two parameters.**	procedures in place to review the efficiency of current conservation and management measures. **Lacking in one parameter.**	current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a procedure to review management measures. The procedure includes the use of outcome indicators against which the success of management measures in achieving specific management objectives is measured. The procedure covers all management measures, including those relating to the sustainable exploitation of the target stock, the mitigation of negative impacts on non-target species through bycatch, discarding, and indirect effects, and the protection of ETP species and the physical environment.
Current Status/Appropriateness/Effectiveness: If, as a result of the review process, it is determined that management measures are not achieving the specific management objectives they are designed to achieve, they are revised and updated as appropriate.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include data showing recent regulation revisions.

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

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

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

The adaptive management approach taken in the Alaska pollock 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 forum[132].

The BOF also provides opportunity for input through public notification and their website[133] 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 pollock in Alaska each year, producing annual SAFE reports for the federally managed EBS, GOA, Aleutian Islands and Bogoslof pollock stocks. ADFG also conducts scientific research and surveys on its state-managed pollock fisheries. 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.

Several management measures have been introduced by NPFMC to address salmon bycatch in the BSAI, e.g. Amendment 91 and 110 to the FMP[134]. These include limits on the number of Chinook and chum salmon that can be caught and incentives to ensure numbers remain low. Amendment 110 also mandates the use of salmon excluder devices in the trawls, and reduces fishing for pollock in months with higher bycatch encounters. Substantial research has been conducted on improving the excluder devices[135], as well as ongoing projects studying the genetics of salmon taken as bycatch to determine their rivers of origin (Guyon et al. 2015[136], Guthrie et al. 2016[137]).

In 2012, Amendment 93 was implemented in the GOA to limit the amount of Chinook salmon caught in the pollock fishery. Amendment 93 establishes separate PSC limits in the Central and Western GOA for Chinook salmon, which would cause NMFS to close the directed pollock fishery in the Central or Western regulatory areas of the GOA, if the applicable limit is reached.

Pollock is considered essential prey for Steller sea lions (SSL) and management measures, such as fishery time and area closures around critical SSL habitat, as well as reductions in seasonal proportions of pollock TAC that can be taken from critical habitat, have been implemented to mitigate possible negative impacts of pollock fisheries on SSL[138].

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

[133] http://www.adfg.alaska.gov/index.cfm?adfg=process.comments

[134] https://alaskafisheries.noaa.gov/fisheries/chinook-salmon-bycatch-management

[135] https://www.npfmc.org/salmon-excluder-efp/

[136] Guyon et al. 2015. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-291.pdf

[137] Guthrie et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-310.pdf

[138] https://www.npfmc.org/protected-species/steller-sea-lions/

The National Environmental Policy Act (NEPA) [139] requires agencies to prepare an Environmental Impact Statement (EIS) on proposals for legislation and other major Federal actions that may significantly affect the quality of the human environment (40 CFR 1502.3). EISs are also prepared (1) when the proposed action is novel, (2) when there is controversy in the underlying science used to understand the impacts of the alternatives, or (3) when the potential impacts are unknown. All of the NPFMC proposed regulations and the FMPs include NEPA considerations[140]. 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)[141] was undertaken. This was a major review and analysis of the effect of the groundfish fisheries on the North Pacific Ecosystem and provided the NPFMC, NMFS, ADFG and stakeholders with information to further inform decision-making as to the consequences of the FMPs. In 2015, the NPFMC produced a PSEIS Supplemental Information Report[142] which updated the 2004 PSEIS.

Conclusion:

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

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

Salmon bycatch management https://alaskafisheries.noaa.gov/fisheries/chinook-salmon-bycatch-management

Salmon excluder devices https://www.npfmc.org/salmon-excluder-efp/

Guyon et al. 2015. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-291.pdf

Guthrie et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-310.pdf

Steller Sea Lion protection https://www.npfmc.org/protected-species/steller-sea-lions/

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.

139 https://www.epa.gov/nepa

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

141 https://alaskafisheries.noaa.gov/fisheries/groundfish-seis

142 https://alaskafisheries.noaa.gov/sites/default/files/sir-pseis1115.pdf

- Management arrangements,
- Decision making.

FAO CCRF 7.1.9

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

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

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

Current Status:
Management arrangements for the Alaska pollock fisheries are easily accessible on the, NMFS[143] NPFMC[68,69] and ADFG[144] websites and from NMFS and ADFG offices as well as local offices of the Office of Law Enforcement (OLE)[145] and Alaska State Wildlife troopers (AWT)[146].

Effectiveness:
The NPFMC imposes transparency so that all NPFMC and NPFMC 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.

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

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

The process used by the NPFMC for decision-making is described in the NPFMC guide for navigating the Council process (NPFMC 2009[147]) and the Council Operating Procedures (NPFMC 2012a).

Conclusion:

[143] https://alaskafisheries.noaa.gov/fisheries/regs-amds
[144] http://www.adfg.alaska.gov/index.cfm?adfg=regulations.main
[145] http://www.nmfs.noaa.gov/ole/about/what_we_do.html
[146] http://dps.alaska.gov/AWT/
[147] https://www.npfmc.org/wp-content/PDFdocuments/help/Navigating_NPFMC.pdf

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

References:
NOAA website regulations https://alaskafisheries.noaa.gov/fisheries/regs-amds

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

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

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

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):

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

NOT APPLICABLE

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

This clause is not applicable. The United States ratified the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas ("Compliance Agreement") on the 19 December 1995. High Sea fishing for Alaskan pollock may only occur in the Donut hole but international agreement between member countries has banned fishing in this central area of the Bering Sea (see clause 1.2. and 1.3 for details).

Conclusion: NOT APPLICABLE
Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas ("Compliance Agreement") on the 19 December 1995 http://www.un.org/depts/los/convention_agreements/convention_20years/1995FishStockAgreement_ATahindro.pdf

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

References:

Non-Conformance Number (if relevant):

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

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

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

FAO CCRF (1995) 10.1.1, 10.1.3, 10.2.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
An appropriate policy, legal and institutional frameworks is **not** adopted in order to achieve sustainable and integrated use of living marine resources**,** 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	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	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	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

compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in all parameters.**	communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in two parameters.**	communities and their customary practices to the extent compatible with sustainable development, while 4) taking due account of the risks and uncertainties involved in setting policies for the management of coastal areas. **Lacking in one parameter.**	with sustainable development. In setting policies for the management of coastal areas, States 4) take due account of the risks and uncertainties involved. **Fulfils all parameters.**

Evaluation Parameters
Process: A mechanism exists by which the integrated management of multiple coastal area uses is conducted, the possible uses of coastal resources are assessed, and access to them is governed. Accordingly, policies for the management of the coastal area are set.
Current Status/Appropriateness/Effectiveness: The coastal management framework includes explicit consideration of the fragility of coastal ecosystems, the finite nature of coastal resources, and the needs of coastal communities, and accounts for the rights and customary practices of coastal communities. These policies take due account of risks and uncertainties.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include coastal management plans or other policy documents and frameworks for resource/coastal management.

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

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

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

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

Process:
The Coastal Zone Management Act[148] (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,

[148] https://www.gpo.gov/fdsys/pkg/STATUTE-86/pdf/STATUTE-86-Pg1280.pdf

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 pollock fishery, 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[149,150].

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

Evidence Basis:
NOAA has set out their policy and procedures for compliance with NEPA[151] which explicitly sets out NEPA procedures in relations to fisheries. The NMFS Alaska region website also includes all the on-going EFH consultations in relation to coastal development proposals[152].

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 ADFG websites[153] also provide information on their input into planning processes.

Conclusion:

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

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/

149 https://www.npfmc.org/summary-reports/
150 https://www.npfmc.org/wp-content/PDFdocuments/resources/MSA40Booklet.pdf
151 https://alaskafisheries.noaa.gov/sites/default/files/noaa_nepa_companion_guide.pdf
152 https://alaskafisheries.noaa.gov/habitat-consultations/search?search_api_views_fulltext=
153

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. **Fulfils all parameters.**

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

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

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.

Conclusion:

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

References:

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

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

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

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 10.4.2

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

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

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

Process:
The technical capacities of the federal and state agencies involved in the management of Alaska pollock 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 in section 1.6 of this report.

NMFS and AFDG staffing complement are available on their respective websites[154,155].

Conclusion:

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

[154] https://alaskafisheries.noaa.gov/sites/default/files/akorgchart.pdf
[155] http://www.adfg.alaska.gov/index.cfm?adfg=about.structure

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

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

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[156], [157]. 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

[156] https://alaskafisheries.noaa.gov/fisheries/nepa-guidance
[157] http://www.nmfs.noaa.gov/sfa/management/councils/training/2016/2016%20Presentations/jh_nepa_overview_acc.pdf

public information and opportunity for stakeholder involvement at both the state and federal levels. In this way, any application for a permit to undertake an activity or development in the coastal region, requires the agency that is being asked to issue the permit to evaluate the environmental effects of the permit and follow the NEPA process.

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

Current Status/Appropriateness/Effectiveness:
All the fishery agencies have processes, committees and groups that allow coastal zone resource management issues to be brought to formal review and engagement. 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 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 [158,159,160,161].

Conclusion:

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

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/

158 https://www.npfmc.org/upcoming-council-meetings/
159 http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
160 https://www.npfmc.org/committees/rural-outreach-committee/
161 http://www.adfg.alaska.gov/index.cfm?adfg=access.planning

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

Evaluation Parameters
Process: These practices have been adopted, and there is a process to regulate fishing gear, methods and vessels so as to avoid risk of conflict. If conflicts 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 pollock fisheries, that may contribute to minimizing conflict with other sectors or coastal users, for example, the pollock fishery uses pelagic trawls which helps to reduce interaction with the seabed and other sectors that fish on the sea bed; 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 pollock fishery is subject to prohibited species catch limits; the use of excluder devices to minimise salmon bycatch, most recently, in 2016, Amendment 110[162] of the BSAI FMP has been adopted and puts in place a salmon bycatch avoidance program which strengthens the approach that has been taken to date. Allocation disputes in the BSAI pollock fishery are minimized due to the limited access program.

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 and salmon and the pollock fishery, e.g. Amendments 91, 110, 111. These were all extensively discussed within the Council before being implemented and reviewed on a regular basis.

Conclusion:

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

References:

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

Amendment 110 of the BSAI FMP
https://www.federalregister.gov/documents/2016/06/10/2016-13697/fisheries-of-the-exclusive-economic-zone-off-alaska-bycatch-management-in-the-bering-sea-pollock

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

[162] https://www.federalregister.gov/documents/2016/06/10/2016-13697/fisheries-of-the-exclusive-economic-zone-off-alaska-bycatch-management-in-the-bering-sea-pollock

to facilitate their application and thus gain increased support in the implementation of such measures.

FAO CCRF (1995) 7.1.10

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

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

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

Process
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.[163]

The BOF website publishes information on forth-coming BOF meetings including the "Proposal Book"[164] 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References:

NPFMC Home Page https://www.npfmc.org

ADFG Home Page http://www.adfg.alaska.gov

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.

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

[164] http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.proposalbook

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

Process:
The Community Development Quota (CDQ) Program[165] 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 pollock, halibut, Pacific cod, crab and bycatch species.

Current Status/Appropriateness/Effectiveness:
The last review of the CDQ program was 2012[166]. The program is reviewed every ten years[167]. Analysis by the State of Alaska in 2013, determined that each CDQ entity had maintained or improved performance against its objectives.

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

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	There is **insufficient** cooperation at the sub-regional level in order to improve coastal area management and /or	There is **moderate** cooperation at the sub-regional level in order to improve coastal area management and /or	There is cooperation at the sub-regional level in order to improve coastal area management, and in accordance with

[165] https://alaskafisheries.noaa.gov/fisheries/cdq
[166] https://alaskafisheries.noaa.gov/fisheries/cdq-review
[167] https://alaskafisheries.noaa.gov/fisheries/cdq-review

promotion of systems to monitor coastal environment using multidisciplinary research. **Lacking in all parameters.**	establishment or promotion of systems to monitor coastal environment using multidisciplinary research. **Lacking in two parameters.**	establishment or promotion of systems to monitor coastal environment using multidisciplinary research. **Lacking in one parameter.**	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. **Fulfils all parameters.**

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

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

Process:
A considerable amount of monitoring of the coastal environment in Alaska is performed and supported by multiple federal and state agencies, e.g. NMFS, AFSC, ADFG, institutions of higher learning, e.g. the University of Alaska Fairbanks Institute of Marine Science[168] and organisations that support and facilitate marine research, e.g. North Pacific Research Board[169]

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 Gulf of Alaska, Bering Sea, and Arctic. The goal for this assessment is to develop models relating these fisheries-oceanographic indices to productivity of commercially important fish species (such as pollock, cod, 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.

NMFS, Alaska Region, Fisheries' Habitat Conservation Division[170] (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

[168] http://www.uaf.edu/cfos/research/institute-of-marine-scien/
[169] http://www.nprb.org
[170] https://alaskafisheries.noaa.gov/habitat

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 Laboratory[171] (PMEL) undertakes marine ecosystem research focusing on measuring, understanding, and predicting impacts of natural physical, chemical, biological, geological, and anthropogenic processes on the oceanic web of life. A sub-set of their work known as "Oceans and Coastal Processes Research" includes an understanding of ocean physics and interactions between the ocean, the seafloor and atmosphere.

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

As a result the NPRB have helped fund, two major projects in the Alaska region:
The Bering Sea Project[172], is a partnership between the NPRB and the National Science Foundation[173], 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 disciplines[174], including marine, estuarine and freshwater ecosystems and their related human dimensions.

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

Conclusion:

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

References:

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

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

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

[171] https://www.pmel.noaa.gov
[172] http://www.nprb.org/bering-sea-project/about-the-project/
[173] https://www.nsf.gov
[174] http://www.uaf.edu/cfos/research/institute-of-marine-scien/reasearch-projects/

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

Non-Conformance Number (if relevant):

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

NOT APPLICABLE

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 Alaska pollock fishery.

Conclusion:

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

References:

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 10.3.2

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

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

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process
The risk of oil pollution[175] and polluted water from coastal mining tailings[176] [177] are examples of potential transboundary environmental effects on the coastal area. Coordination and development of

[175] https://alaskafisheries.noaa.gov/sites/default/files/oilspillfactsheet1114.pdf
[176] http://www.fpir.noaa.gov/Library/HCD/EFH%20Non-fishing%20NW-SW%202003.pdf
[177] https://alaskafisheries.noaa.gov/sites/default/files/impactstoefh112011.pdf

memoranda of cooperation and a Pacific States / British Columbia Oil Spill Task Force[178] to deal with oil and other pollution incidents are examples of facilitating pollution preparedness, prevention and response.

Current Status/Appropriateness/Effectiveness:
The State of Alaska is represented in the Oil Spill Task Force by the Department of Environmental Conservation. Its Division of Spill Prevention and Response[179] (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.

Evidence basis:
Pacific States / British Columbia Oil Spill Task Force produce annual reports[180] which include, prevention, preparedness, response and communication updates as well as jurisdictional reviews of the US members' states and British Columbia.

Conclusion:

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

References:
NOAA 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)

[178] http://oilspilltaskforce.org
[179] https://dec.alaska.gov/spar/
[180] http://oilspilltaskforce.org/wp-content/uploads/2017/05/OSTF.annualreport.onscreen.loresCORRECTED.pdf

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. **Lacking in one parameter.**	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.**

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

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process / Evidence Basis:
Under the MSA, the NPFMC is required to prepare and submit a FMP to the secretary of Commerce for approval for each fishery under its authority that is considered to require conservation and management. In so doing, the FMPs have to be consistent with ten national standards for fishery conservation and management (16 USC § 1851).

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

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

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

3. Preserve Food Web:

- Develop indices of ecosystem health as targets for management.
- Improve the procedure to adjust acceptable biological catch levels as necessary to account for uncertainty and ecosystem factors.
- Continue to protect the integrity of the food web through limits on harvest of forage species.
- Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

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

5. Avoid Impacts to Seabirds and Marine Mammals:
   - Continue to cooperate with 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.

Prince William Sound Pollock Management Plan (5 AAC 28.263[181]) was established in 2000. While the plan is available on the ADFG website, it does not specify these founding principles.

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 pollock 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 PWS Pollock Management Plan has, apparently been developed and is 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 the PWS Pollock Management Plan.

[181] http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

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

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

Prince William Sound Pollock Management Plan (5 AAC 28.263)
http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

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. **Lacking in all parameters.**	There is **insufficient** avoidance of excess fishing capacity. **Lacking in two parameters.**	There is **moderate** avoidance of excess fishing capacity. **Lacking in one parameter.**	Excess fishing capacity is avoided and exploitation of the stocks remains economically viable. **Fulfils all parameters.**

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

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

Process
Excess fishing capacity in the BSAI is avoided by the AFA (1998). The Act limits participation and allocates percentages of the BSAI pollock fishery TAC among the fishery sectors (Section 206 of the Act). After deducting 10% of the TAC for the CDQ program and an incidental catch allowance, 50% of the remaining TAC is allocated to the inshore vessel sector; 40% to the catcher processor sector; and, 10% to the mothership sector.

In 2000, the NPFMC adopted the Alaska Licence Limitation Program[182] (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.

[182] https://alaskafisheries.noaa.gov/fisheries/llp

Current Status/Appropriateness/Effectiveness:
The capacity of the pollock fleets are not capped, rather, the proportion of the quota available has, in effect, capped capacity. There have been relatively few new builds in the fishery, the tendency has been to re-fit existing vessels and, there is no incentive to invest in spare catching, rather the investment has been in improving CPUE (pers. comm. Dave Witherell, NPFMC).

In the state PWS pollock fishery, the GHL was 13 million pounds in 2016 and 9.4 million pounds in 2017annually. On average from 2009-2016, 8-19 trawlers show up in any year; and these are rigorously managed to spread the catch across the harvest area so as to not cause localized depletions which might impact endangered Steller sea lions. The vessels that participate in this small fishery are normally selected and agreed to by the Kodiak trawl fleet. Daily catches and landings are reported to ADFG.

Evidence Basis:
The number and size of vessel in the AFA fleets have not increased owing to the lack of incentive to increase capacity

Conclusion:

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

References:
The Economic Value of Alaska Seafood Industry 2015
http://ebooks.alaskaseafood.org/ASMI_Seafood_Impacts_Dec2015/pubData/source/ASMI%20Alaska%20Seafood%20Impacts%20Final%20Dec2015%20-%20low%20res.pdf

AFSC Fact sheet on climate change
https://www.afsc.noaa.gov/Education/factsheets/10_Wpoll_FS.pdf

EBS Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

GOA Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

Non-Conformance Number (if relevant):

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

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

Evaluation Parameters

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

Evaluation (per parameter)/: General description of evidence in order to score the clause
Process
National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and NPFMC follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal pollock fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations (e.g. the OY limits). The fisheries management system is supported by high level science and the biomass of pollock 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.

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

Estimates of ex-vessel value by area, gear, type of vessel, and species, are included in the annual Economic Status appendix to the SAFE report[183]. Alaska pollock is the dominant species in terms of catch in the BSAI. It accounted for 69% of the BSAI's FMP groundfish harvest and 89% of the total pollock harvest in Alaska. Retained catch of pollock increased 2.2% to 1.3 million t in 2015. BSAI pollock first-wholesale value was $1.28 billion 2015, which was down slightly from $1.3 billion in 2014 but above the 2005-2007 average of $1.25 billion.
In the GOA[184], recent increases in the total allowable catch have resulted in a doubling of the total catch from 2011 to 2015. Retained catch of pollock increased 16% in 2015 to 163 thousand t. GOA pollock first-wholesale value was $99 million 2015

Conclusion:

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

References:
EBS Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

GOA Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

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	**Medium Confidence Rating**	**Medium Confidence Rating**	**High Confidence Rating**

[183] https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf
[184] https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

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

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

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

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

Current Status/Appropriateness/Effectiveness:
The GOA and BSAI FMPs describe management measures designed to take into account the interests of subsistence, small-scale, and artisanal fisheries. Specific FMP management objectives and sub-objectives include: the promotion of sustainable fisheries and communities, the promotion of equitable and efficient use of fishery resources and increase Alaska 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 pollock 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 Chinook and chum salmon bycatch.

While one of the key responsibilities of the ADFG is subsistence fisheries, the state Pollock fishery is not considered to be a subsistence fishery.

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

Conclusion:

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

References:

EBS Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

GOA Economic Status, Appendix to the SAFE report
https://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.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. **Lacking in all parameters.**	There is **insufficient** conservation of aquatic habitats and ecosystems' biodiversity and endangered species protection, and where relevant, pertinent objectives, and as necessary, management measures. **Lacking in two parameters.**	There is **moderate** conservation of aquatic habitats and ecosystems' biodiversity and endangered species protection, and where relevant, pertinent objectives, and as necessary, management measures. **Lacking in one parameter.**	Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected. Where relevant, there are pertinent objectives, and as necessary, management measures. **Fulfils all parameters.**

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

Evaluation:
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 – particularly 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 improved estimates of the stock of origin (from both CWT and genetic stock assignment) of the Chinook bycatch from the pollock fishery.

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

Objectives set out in the BSAI and GoA FMPs are:

- Continue to cooperate with 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.

BSAI pollock fishery: Marine mammals are rarely taken incidentally in the BSAI pollock 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). Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. 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. 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 haul outs. Effects on mammals are specifically considered when setting pollock TACs and seasonal allowances.

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. Trawl fisheries for pollock and other species account for a small fraction of seabird bycatch. AFSC (S Fitzgerald pers. comm.) report very low bycatch of seabirds, with no observed takes of

short- tailed albatross. AFSC have been researching potential "cryptic" mortality, in which bird bycatch can happen on trawl vessels where the birds are not available to standard sampling. Overall, however, there are considered to be no marine bird conservation issue for pelagic trawl vessels, especially in the pollock fleet.

The estimates of endangered salmon in the pollock fishery come from coded-wire tag recoveries from salmon bycatch. These data indicate that between 1984 and 2012 few wild Chinook from the lower Columbia or upper Willamette rivers were taken by the pollock fishery (Ford 2011). Most (97%) of the CWT recoveries are from hatchery salmon. Given the small number of Chinook estimated to have been taken in the pollock fishery, the BSAI pollock fishery is highly unlikely to pose a threat to ESA-listed salmon populations in the Pacific Northwest.

GoA Pollock fishery: As with the BSAI fishery, direct interactions of pollock gear with marine mammals is very rare. 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.

As with the BSAI, there are considered to be no marine bird conservation issue for pelagic trawl vessels, especially in the pollock fleet. 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.

Observer Program data provide annual estimates of takes of ETP 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 supported by well-designed data-gathering programmes and analyses; these are widely available through NMFS and NPFMC websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

Conclusion:

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

References: 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	There are **insufficiently** clear objectives for avoidance, minimization or mitigation of impacts on essential fish	There are **moderately clear** objectives for avoidance, minimization or mitigation of impacts on essential fish	There are management objectives seeking to avoid, minimize or mitigate impacts of the unit of certification on essential habitats for the stock under

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

Evaluation Parameters

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

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

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

Evaluation

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

References:
NPFMC 2016a; NPFMC 2017; NMFS 2016a; NMFS 2016b; NMFS 2017b

Non-Conformance Number (if relevant):

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

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

Evaluation Parameters
Process: There is a process in place by which adverse impacts of the fishery, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible are identified. This process results in setting relative management objectives. Management priority shall be focused primarily towards minimizing and avoiding impacts.
Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, or other regulatory document or laws.

Evaluation:

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.

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, 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
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 pollock

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

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

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

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

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

FAO Eco (2009) 29.1-29.3

FAO Eco (2011) 36.1, 36.3, 36.4

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

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

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

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

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

Evaluation (per parameter Process: There is a satisfactory process to account for fishery removals and mortality of pollock, 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 in the directed fisheries by all gears, by-catch in trawl fisheries, 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 Alaskan pollock 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 pollock 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 four 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.

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 pollock 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 pollock fisheries are recorded by observers, reported through the CAS, and presented in the annual stock assessments. Recreational removals are not reported to CAS, but are estimated and are relatively minor for pollock 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 pollock catches is found in the 2016 SAFE documents, such as the one for the 2016 EBS pollock assessment[185]. Catch reports for pollock in the BSAI and GOA Regions for 2016 and previous years can be found on the NMFS Alaskan fisheries website. ADFG also produces documents on the PWS pollock fishery. Other catch-related data from the fishery such as CPUE, location of catches, etc. are routinely collected and presented in the stock assessment SAFE reports.

Conclusion:

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

Reference Ianelli et al. 2016, NMFS 2017, ADFG 2017

Non-Conformance Number (if relevant):

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

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

FAO Eco (2011) 36.3, 36.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such data. Also, there is **no**	There is **insufficient** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such	There is **moderate** availability of timely, complete and reliable statistics to allow sound analysis and regular maintenance, update and verification of such	Timely, complete and reliable statistics are compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices

[185] Ianelli et al. 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in all parameters.**	data. Also, there is **insufficient** promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in two parameters.**	data. Also, there is **moderate** promotion/use and distribution of this data to ensure a link between applied research and fisheries management. **Lacking in one parameter.**	and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly and verified through an appropriate system. The use of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage, between applied research and fisheries management (e.g. adoption of scientific advice) is promoted. Results of analysis are distributed accordingly as a contribution to fisheries conservation, management and development. **Fulfils all parameters.**
Evaluation Parameters **Process**: There is a process or system that allows for the production, maintenance, update, and verification of statistical data to international standards. Such standards include the FAO coordinating working party on fishery statistics Handbook of Fishery Statistical Standards. Also, there is a process for the use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria, as well as for ensuring adequate linkage between applied research and fisheries management (e.g. adoption of scientific advice). **Current Status/Appropriateness/Effectiveness**: There is evidence for the production, maintenance, updating and review of statistical data on catch and fishing effort in the fishery under assessment. There is evidence that the best and most up-to-date scientific information is used to inform the fisheries management process. Where there is a legal requirement for the advice of scientific authorities to be adopted, this shall be viewed as conformance with this evaluation parameter. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports and other data.			
Evaluation Parameters **Process**: For all Alaskan pollock fisheries, there is a well-established system that allows for the production, maintenance, regular update, and verification of statistical data. This system includes the CAS described in the previous section, as well as websites and detailed publications maintained by NMFS and other agencies. These processes are fully compliant with international standards such as the FAO Handbook of Fishery Statistical Standards, in that key information such as landings, areas, fleets, gear, number of fishers, etc. is collected and maintained in accessible databases. The use and distribution of research results as a basis for the setting of management objectives, reference points and performance criteria is driven by the NPFMC[186] 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 pollock fisheries in Alaska. Long time series of catch and effort data exist for pollock, 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 and include scientists from NMFS,			

[186] NPFMC FMP http://www.npfmc.org/fishery-management-plans/

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 pollock fisheries. Management is clearly is based on the scientific advice, without exception.

Evidence Basis: Data on catches of Alaskan pollock are maintained and updated by NMFS and are available on their website[187]. The SAFE documents[188],[189],[190],[191] for the 4 federal-waters pollock stock components contain extensive details on the catch and other data time series used in the stock assessments, including the catches from the PWS pollock fishery.

The Alaska Fisheries Information Network (AKFIN) was established in 1997 and maintains an analytic database of both state and federal commercial fisheries data in Alaska[192] relevant to the needs of fisheries scientists and other users, and provides that data in usable formats.

Conclusion:

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

References: NPFMC 2017, 2016 SAFE documents, AKFIN, NPFMC 2017, NMFS 2017

Non-Conformance Number (if relevant):

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

FAO Eco (2009) 30.4

FAO ECO (2011) 37.4

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

Evaluation Parameters

[187] NMFS Catch reports https://alaskafisheries.noaa.gov/fisheries-catch-landings

[188] EBS SAFE http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

[189] AI SAFE http://www.afsc.noaa.gov/REFM/Docs/2016/AIpollock.pdf

[190] BOG SAFE http://www.afsc.noaa.gov/REFM/Docs/2016/BOGpollock.pdf

[191] GOA SAFE http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

[192] AKFIN http://www.akfin.org/about-akfin

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 Pollock assessments are conducted on a stock-specific basis.

Conclusion:

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

References: NMFS 2017, Ianelli et al. 2016a, Barbeaux et al. 2016,Ianelli et al. 2016b, Dorn et al. 2016, AKFIN 2017.

Non-Conformance Number (if relevant):

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

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

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No observer scheme designed to collect accurate data for research and to support compliance. **Lacking in all parameters.**	Observer scheme established but there is **insufficient** collection of accurate data for research and to support compliance. **Lacking in two parameters.**	Observer scheme established but there is **moderate** collection of accurate data for research and to support compliance. **Lacking in one parameter.**	An observer scheme designed to collect accurate data for research and support compliance with applicable fishery management measures is established. **Fulfils all parameters.**

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

fisheries management are collected or if there are important data gaps (e.g., because of the absence of an observer program).
Current Status/Appropriateness/Effectiveness: The data collected by the observer program is considered accurate and useful.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment, observer, survey, observer or other reports.

Evaluation (per parameter
Process: Beginning in 2013, Amendment 86 to the FMP of the BSAI and Amendment 76 to the FMP of the GOA established the new North Pacific Groundfish and Halibut Observer Program (NPGHOP)[193]. 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 fishing for groundfish in federal waters are required to carry observers, at their own expense, for at least a portion of their fishing time. 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. Observers were also assigned to monitor deliveries of pollock to obtain a count of the number of salmon caught as bycatch and to obtain genetic samples from these fish.

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 NMFS website. Data collected by the observer program feed directly into various datasets and studies used in the pollock 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 pollock, providing the Observer Program with over 37,000 data collection days annually[194]. Observer coverage in the EBS Pollock fishery has been at or near 100% (often classified as 200% with 2 observers per vessel) for the past several years, while in the GOA, lower coverage rates exist. In the 2016 fishery in GOA, about 30% of pollock caught was observed[195], with the fishery being about 90% by catcher vessels using pelagic trawls. An analysis (Faunce et al. 2016) of the 2015 observer program deployment shows 22% of 1864 total pollock deliveries in the GOA Alaska were observed[196]. NMFS and the NPFMC have developed an Electronic Monitoring (EM) Strategic Plan to integrate video monitoring into the Observer Program to improve data collection[197].

Conclusion:

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

References: NMFS 2015, NMFS 2016, AFSC 2016, Faunce et al. 2016, NPFMC 2016
Non-Conformance Number (if relevant):

[193] Observer Program https://alaskafisheries.noaa.gov/sites/default/files/analyses/finalea_restructuring0915.pdf
[194] https://www.afsc.noaa.gov/FMA/Manual_pages/MANUAL_pdfs/manual2016.pdf
[195] Observer report for 2016. https://www.afsc.noaa.gov/Publications/ProcRpt/PR2017-07.pdf
[196] Faunce et al. 2016. Observer deployment report for 2015 https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-322.pdf
[197] Electronic monitoring http://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/Observer/EM/2016EMpre-impPlanFinal0116.pdf

4.3 Sub-regional or regional fisheries management organizations or arrangements shall compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures. ***FAO CCRF (1995) 7.4.6/7.4.7***			
Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in all parameters.**	There is **insufficient** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in two parameters.**	There is **moderate** compilation and distribution of data in accordance with confidentiality requirements. **Lacking in one parameter.**	Sub-regional or regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements, in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures. **Fulfils all parameters.**
Evaluation Parameters Not applicable if no regional or sub-regional body is involved in fishery management between one or more countries. **Process**: There is a system within the regional or sub-regional body structure that allows for data distribution in line with confidentiality requirements. **Current Status/Appropriateness/Effectiveness**: There is evidence proving that confidentiality requirements are satisfied when data is distributed to the various parties. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include reports where confidentiality requirements have been effected.			
Evaluation (per parameter Process: There are systems within NMFS, NPFMC, and ADFG management structures that allow for complete data distribution in line with confidentiality requirements. **Current Status/Appropriateness/Effectiveness**: NMFS and ADFG have extensive scientific databases which include pollock, and NPFMC has substantial information on management of pollock in Alaskan waters. These data are made widely available through the agency websites, publications and at various publicly-attended meetings. Data on certain aspects of commercial fishing are considered to be confidential, such as individuals or individual vessels in the analysis of fishery CPUE data, depending on the number of individuals or entities involved **Evidence Basis:** NPFMC management plans, and SAFE documents contained detailed data which is widely disseminated, and confidentiality is maintained as necessary. The Commercial Fisheries Entry Commission[198] 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.			
Conclusion:			

[198] CFEC State of Alaska Commercial Fisheries Entry Commission https://www.cfec.state.ak.us/

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: CFEC 2017. NMFS 2016, NPFMC 2016				
Non-Conformance Number (if relevant):				

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

FAO CCRF 12.7

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** stimulation of research required to support national policies related to fish as food. **Lacking in all parameters.**	There is **insufficient** stimulation of research required to support national policies related to fish as food. **Lacking in two parameters.**	There is **moderate** stimulation of research required to support national policies related to fish as food. **Lacking in one parameter.**	The State stimulates the research required to support national policies related to fish as food. **Fulfils all parameters.**

Evaluation Parameters
Process: There is research to support national policies related to fish as food.
Current Status/Appropriateness/Effectiveness: There is evidence of this research.
Evidence Basis: Availability, quality, and adequacy of the evidence.

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

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

Evidence Basis: ASMI[199] 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)[200], which directs efforts in several fields, including seafood processing technology, and seafood quality and safety. KSMSC staff work closely with the fishing industry to convey research results and provide educational opportunities that help seafood workers improve efficiency and the quality of their products.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

[199] ASMI http://www.alaskaseafood.org

[200] University of Alaska FairbanksKodiak Seafood and Marine Science Center https://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
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. **Lacking in all parameters.**	There is **insufficient** assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation. **Lacking in two parameters.**	There is **moderate** assessment of socio-economic, marketing and institutional aspects of fisheries for ongoing monitoring, analysis and policy formulation. **Lacking in one parameter.**	The state ensures that the economic, social, marketing and institutional aspects of fisheries are adequately researched and that comparable data are generated for ongoing monitoring, analysis and policy formulation. Fulfils all parameters.

Evaluation Parameters
Process: There is a system in place by which knowledge of the economic, social, marketing and institutional aspects of fisheries is collected.
Current Status/Appropriateness/Effectiveness: These data are used for ongoing monitoring, analysis and policy formulation.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports on social/cultural/economic value of the resource.

Evaluation (per parameter)/: **Process**: Socio-economic data collection and economic analyses are required to varying degrees under the Regulatory Flexibility Act (RFA), the MSA, the NEPA, the Endangered Species Act, and other applicable laws. AFSC/NMFS Economic and Social Sciences Research Program produces an annual Economic Status Report of the Groundfish fisheries in Alaska.

Current Status/Appropriateness/Effectiveness: The economic and socio-economic data collected for the pollock fisheries are extensive, and data are used for ongoing analysis. These analyses include estimates of total pollock 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 pollock, and relate changes in value, price, and quantity, across species, product and gear types, to changes in the market.

Evidence Basis: Annual economic SAFE reports (e.g. Fissel et al. 2016) on social/cultural/economic value of the Alaskan fisheries resources are produced, which include extensive information on the Alaskan pollock 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[201] summarizes overall industry impacts, participation, value, and exports. Individual pollock assessment SAFE reports have extensive sections on the economic performance of the pollock fisheries.

[201] ASMI http://ebooks.alaskaseafood.org/ASMI_Seafood_Impacts_Dec2015/#/0/

Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: ASMI 2015, Fissel et al. 2016				
Non-Conformance Number (if relevant):				

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

FAO CCRF 12.12

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in all parameters.**	There is **insufficient** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in two parameters.**	There is **moderate** investigation and documentation traditional fisheries technology applied to small scale fisheries. **Lacking in one parameter.**	The State investigates and documents traditional fisheries knowledge and technologies, in particular those applied to small scale fisheries, in order to assess their application to sustainable fisheries conservation, management and development. **Fulfils all parameters.**

Evaluation Parameters
Process: Traditional fisher knowledge has been investigated. Note that for highly developed fisheries that knowledge may already have been integrated into fisheries management.
Current Status/Appropriateness/Effectiveness: There are records of the documentation of small scale fisher practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various fisheries reports.

Evaluation (per parameter)/:
Process: Highly developed fisheries such as those for Alaskan pollock incorporate broad knowledge sources into fisheries management.

Current Status/Appropriateness/Effectiveness: Most pollock fisheries in Alaskan waters are large-scale operations such as catcher /processors or large catcher vessels. Smaller fisheries such the state-managed one in Prince William Sound are effectively regulated and take into account any issues related to smaller scale localized fisheries.

Evidence Basis: Smaller scale fisheries managed by ADFG and BOF are controlled with specified catch levels and other regulations, such as closed areas around Steller sea lion rookeries[202]. As noted in Clause 3.1, an explicit objective in the NPFMC FMP is to increase Alaska Native consultation as follows:

[202] https://www.adfg.alaska.gov/static/applications/dcfnewsrelease/634206707.pdf

- 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.

Conclusion:

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

References: ADFG 2016, NPFMC 2017

Non-Conformance Number (if relevant):

4.7 States conducting scientific research activities in waters under the jurisdiction of another State shall ensure that their vessels comply with the laws and regulations of that State and international law.

FAO CCRF 12.14

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Research vessels do **not** comply with the laws and regulations of that State and international law. **Lacking in all parameters.**	Research vessels **insufficiently** comply with the laws and regulations of that State and international law. **Lacking in two parameters.**	Research vessels **moderately** comply with the laws and regulations of that State and international law. **Lacking in one parameter.**	The state conducting scientific research activities in waters under the jurisdiction of another State ensures that their vessels comply with the laws and regulations of that State and international law. **Fulfils all parameters.**

Evaluation Parameters

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

Process: There is a system in place to manage the conduct of research vessels operating in waters under the jurisdiction of other states

Current Status/Appropriateness/Effectiveness: If so, there is record of such shared research activities and they comply with required regulations.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports.

Evaluation (per parameter)/:

Process: The fishery for pollock in Alaska is conducted by US vessels only. In adjacent waters of the Bering Sea cooperation on pollock research and management between Russia and USA occurs as part of the science and management process.

Current Status/Appropriateness/Effectiveness: The United States and Russian Federation maintain the bilateral Intergovernmental Consultative Committee (ICC) fisheries forum pursuant to the U.S.-Soviet Comprehensive Fisheries Agreement, signed on May 31, 1988. This has resulted in cooperative research on pollock in the Bering Sea.

Evidence Basis: Evidence, including meeting reports, on the Russia-USA cooperation, and participation in ICC and Convention meetings can be found in Clauses 5.3 and 5.4. USA vessels have

conducted research in Russian waters, in cooperation with Russian scientists, and in compliance with Russian and international rules.

Conclusion:

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

References: ADFG 2017

Non-Conformance Number (if relevant):

4.8 States shall promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and shall, where appropriate, support the establishment of mechanisms, including, inter alia, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and shall encourage the sharing of such research results with other regions.

FAO CCRF 12.15, 12.16

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Does **not** promote adoption of uniform guidelines governing high seas research or sharing of data between regions or sub-regions. **Lacking in all parameters.**	**Insufficiently** promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions. **Lacking in two parameters.**	**Moderately** promote adoption of uniform guidelines governing high seas research and sharing of data between regions or sub-regions. **Lacking in one parameter.**	States promote the adoption of uniform guidelines governing fisheries research conducted on the high seas and, where appropriate, support the establishment of mechanisms, including, *inter alia*, the adoption of uniform guidelines, to facilitate research at the sub-regional or regional level and encourage the sharing of such research results with other regions. **Fulfils all parameters.**

Evaluation Parameters
If the stock is fully managed by one state and there is no need for shared stock research (between two or more jurisdictions), then this clause is not applicable.
Process: There is a mechanism in place to allow the development and review of guidelines governing fisheries research conducted on the high seas.
Current Status/Appropriateness/Effectiveness: There is a record of uniform high seas research guidelines or a mechanism to create them.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include survey reports, high seas guidelines.

Evaluation (per parameter)/:
Process: The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Donut Hole) is responsible for the conservation, management, and optimum utilization of pollock resources in the high seas area of the Bering Sea. Member states (China, Japan, Korea,

Poland, Russia, and the United States) cooperate on fisheries research and present results of this work at various meetings.

Current Status/Appropriateness/Effectiveness: The objectives of this Convention include cooperation in the gathering and examining of factual information concerning Pollock and other living marine resources in the Bering Sea. Annual meetings and conferences are held. The USA is also a member of the North Pacific Marine Science Organization (PICES)[203], an intergovernmental scientific organization established in 1992 to promote and coordinate marine research in the northern North Pacific and adjacent seas.

Evidence Basis: From the 2015 Convention meeting report[204], the USA surveys which included work in Russian waters were discussed. The PISCES scientific program named FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems) is designed to understand how marine ecosystems in the North Pacific respond to climate change and human activities.

Conclusion:

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

References:
The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Donut Hole)
The PISCES scientific program named FUTURE (Forecasting and Understanding Trends, Uncertainty and Responses of North Pacific Marine Ecosystems)

Non-Conformance Number (if relevant):

Not applicable

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

FAO CCRF 12.18

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Does **not** enhance research capacity of developing countries. **Lacking in all parameters.**	**Insufficiently** enhance research capacity of developing countries. **Lacking in two parameters.**	**Moderately** enhance research capacity of developing countries. **Lacking in one parameter.**	States and relevant international organizations promote and enhance the research capacities of developing countries, *inter alia*, in the areas of data collection and analysis, information, science and technology, human resource development and provision of research facilities, in order for them to participate

[203] http://meetings.pices.int/members/scientific-programs

[204] Convention 2015 annual report https://www.afsc.noaa.gov/REFM/CBS/Docs/20th%20Annual%20Conference/DONUT%202015%20S&T%20Report%20-%20Final.pdf

			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)/: Not applicable as there are no developing countries fishing this stock.

Conclusion:

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

References: NA

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)/: Not applicable as these stocks are not considered to be unfished or very lightly fished.

Conclusion:

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

References: NA

Non-Conformance Number (if relevant):

Not applicable

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

FAO CCRF 12.20

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Competent national organizations, where appropriate, do **not** render technical and financial support towards research effort. **Lacking in all parameters.**	Competent national organizations, where appropriate, **insufficiently** render technical and financial support towards research effort. **Lacking in two parameters.**	Competent national organizations, where appropriate, **moderately** render technical and financial support towards research effort. **Lacking in one parameter.**	Competent national organizations, where appropriate, render technical and financial support to States upon request and when engaged in research investigations aimed at evaluating stocks which have been previously unfished or very lightly fished. **Fulfils all parameters.**

Evaluation Parameters
Note: this clause is relevant where the fishery is within a developing region/small island region and management of the resource is performed through an international organization.
Process: The international management component of the fishery is engaged in processes that support the fishery based in developing countries.

Current Status/Appropriateness/Effectiveness: 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)/: Not applicable as the fisheries are not within a developing region or small island region.

Conclusion:

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

References: NA

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 Conservation 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 Pollock. 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 4 pollock 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 pollock 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.

The Pollock Conservation Cooperative (PCC) Research Center at the School of Fisheries and Ocean Sciences in University of Alaska Fairbanks was established in 2000 to improve knowledge about the North Pacific Ocean and Bering Sea through research and education, focusing on the commercial fisheries of the Bering Sea and Aleutian Islands. The Center receives extensive funding from the pollock fishing industry in Alaska, including the PCC, and provides grants and other funding for research on pollock and other species.

Evidence Basis: The NMFS/AFSC website has detailed information on Alaskan pollock research and stock assessment[205]. The SAFE reports (see Section 4 above for details and references to the four pollock 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[206],[207] 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 pollock stock assessment). This document is reviewed first by the NPFMC Groundfish Plan Team, then by the Scientific and Statistical Committee (SSC) and Advisory Panel, and finally by the full Council. The review by the SSC[208] 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 Pollock assessment was reviewed by three external reviewers from the CIE during May 16-19, 2016, and their reports are available on the NMFS website[209]. One of the priorities of the PCC is improving fish stock assessment models. The PCC produces an annual report[210] for presentation to the NPFMC.

[205] NMFS 2017. https://www.afsc.noaa.gov/species/pollock.php

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

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

[208] SSC Report http://npfmc.legistar.com/gateway.aspx?M=F&ID=2705c3ce-ed5a-4ab3-9936-4cf70912ee1c.pdf

[209] CIE Reviews https://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2016

[210] Pollock Conservation Cooperative https://alaskafisheries.noaa.gov/sites/default/files/reports/pcchscc15.pdf

Conclusion:

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

References: NMFS 2017, NPFMC 2017, CIE 2016, PCC 2015

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, as described in previous clauses, and thus this clause can be scored with full conformance.			
Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: See previous clause				
Non-Conformance Number (if relevant):				

5.1.2 States shall ensure that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science. Results of analyses shall be distributed in a timely and readily understandable fashion in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research, taking into account the special needs of developing countries.

FAO CCRF (1995) 12.1/7.4.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The state does **not** conduct and make available appropriate research into the following aspects of fisheries: biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science, or provide appropriate training, staffing and institution building to conduct the research. **Lacking in all parameters.**	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. **Lacking in two parameters.**	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. **Lacking in one parameter.**	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. **Fulfils all parameters.**

Evaluation Parameters

Process: There are organizations and processes in place to permit research into all aspects of fisheries, as listed in the clause.

Current Status/Appropriateness/Effectiveness: Research is carried out in fisheries biology, fisheries ecology, fisheries technology, environmental science, fisheries economics, social science, aquaculture, nutritional science. In fisheries where there is no demonstrable nutritional science being conducted, but all other types of research are carried out, the fishery shall be deemed compliant with this evaluation parameter.

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

Evaluation (per parameter)/: **Process**: Appropriate research is conducted into all aspects of pollock 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 pollock 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 and GOA Regions which are used to derive indices of pollock abundance. NMFS research plans and priorities are listed in the annual pollock 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 four pollock 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 pollock, details of stock assessment, and survey methodology and results (e.g. Honkalehto et al. 2017).

The comprehensive Economic Status Report (Fissel et al. 2016) 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 pollock fishery.

The Bering Sea Project, a partnership between the The North Pacific Research Board (NPRB) and the National Science Foundation, is studying the Bering Sea ecosystem from atmospheric forcing and physical oceanography to humans and communities, as well as socio-economic impacts of a changing marine ecosystem. Scientists and researchers from a number of agencies and universities are involved. Ecosystem modelling, sound data management, and education and outreach activities are included in the program[211]. An integrated GOA Ecosystem project, also funded by the NPRB, is examining recruitment processes of major groundfish species.

The University of Alaska[212] provides bachelor, masters and doctoral programs in fisheries science, associate degrees and certificates in fisheries technology. University faculty supervise graduate student research on a broad array of biological topics including quantitative stock assessment, biology and ecology of marine and freshwater species, molecular genetics, and behavioural ecology. Facilities are located in Juneau, Seward, Kodiak and Fairbanks. The University of Alaska Fairbanks Kodiak Seafood and Marine Science Center[213] 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..

Formed in 1998, the North Pacific Fisheries Research Foundation (NPFRF) was established by participants of the Bering Sea groundfish trawl fishery to fund, direct, and otherwise oversee applied scientific research regarding the fisheries and fishery resources of the North Pacific, in the interest of the commercial fishing industry.

[211] NPRB website http://www.nprb.org/assets/images/uploads/01.10_bsag_web.pdf.

[212] University of Alaska https://www.uaf.edu/sfos/research/fisheries/

[213] University of Alaska Kodiak Center http://www.uaf.edu/sfos/about-us/locations/kodiak/about-ksmsc/

As detailed in Clause 5.1, the Pollock Conservation Cooperative (PCC) Research Center at the School of Fisheries and Ocean Sciences in University of Alaska Fairbanks provides grants and other funding for research on pollock and other species. As well, NPFRF has funded several projects on salmon excluder devices for the pollock trawl fisheries[214].

Conclusion:

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

References:NPRB 2017, UAF 2017, NPFRF 2017

Non-Conformance Number (if relevant):

5.2 There shall be established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.

FAO CCRF (1995) 12.5
FAO Eco (2009) 31

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in all parameters.**	There is an **insufficiently** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in two parameters.**	There is a **moderately** established capacity for assessment and monitoring of 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Lacking in one parameter.**	There is established research capacity necessary to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system that establishes the required research capacity needed to assess and monitor 1) the effects of climate or environment change on fish stocks and aquatic ecosystems, 2) the state of the stock under State jurisdiction, and for 3) the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration.
Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that there is sufficient research capacity in place for assessing and monitoring the state of the stock under consideration, impacts of fishing pressure, pollution and habitat alteration and the effects of climate or environment change on fish stocks and aquatic.

[214] North Pacific Fisheries Research Foundation (NPFRF)website http://www.npfrf.org/

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

Evaluation (per parameter)/: **Process:** The NMFS, ADFG, and University of Alaska maintain established research programs to monitor the state of the pollock stocks and effects of fishing, pollution, habitat alteration and climate change. The Oil Spill Recovery Institute (OSRI) located in PWS is set up to conduct research into oil spills and their effects on the Alaskan environment, particularly the natural resources in PWS.

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 including pollock. 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 pollock. 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 pollock 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. Extensive ecosystem documentation is presented in each SAFE assessment report. Effects of temperature and other environmental factors on key stock assessment results such as recruitment are considered.

Research is also conducted into climatic variables and mechanisms that affect pollock recruitment. In addition, ecosystem modelling is conducted, including the Bering Sea Regional Oceanographic Model 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 has been carried out for EBS, AI and GoA which provides 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 NPFMCl – 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). More information on these studies is contained in Section 3.9 above.

The North Pacific Research Board (NPRB) has developed two special projects that seek to understand the integrated ecosystems of the BSAI and GOA. For example, in the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the $17.6 million GOA ecosystem study that looks at the physical and biological mechanisms that determine the survival of juvenile groundfish in the eastern and western Gulf of Alaska[215].

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

[215] NPRB website http://www.nprb.org/gulf-of-alaska-project

maturity". NMFS and NPFMC must describe and identify EFH in fishery management plans (FMPs), minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH[216].

OSRI produces an annual report[217], 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

References: NPRB 2017, NPFMC 2017, OSRI 2017

Non-Conformance Number (if relevant):

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

FAO 12.*7*

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in all parameters.**	There is **insufficient** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in two parameters.**	There is **moderate** cooperation of management organizations with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Lacking in one parameter.**	Management organizations cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources. **Fulfils all parameters.**

Evaluation Parameters
Process: There is cooperation or interaction between international organizations to ensure optimum utilization of resource.
Current Status/Appropriateness/Effectiveness: There is evidence available to substantiate that such cooperation or interaction has taken place. There is data available that substantiates cooperation activities.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)/: Process: The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Donut Hole) is responsible for the conservation, management, and optimum utilization of pollock resources in the high seas area of the Bering Sea. Member states (China, Japan, Korea, Poland, Russia, and the United States) have maintained a moratorium on commercial pollock fishing in the Convention Area since 1993 in an effort to allow the stock to rebuild.

[216] NPFMC EFH http://www.npfmc.org/habitat-protections/essential-fish-habitat-efh/

[217] OSRI website http://www.pws-osri.org/wp-content/uploads/2013/05/FY16-Annual-report.pdf

Current Status/Appropriateness/Effectiveness: The objectives of this Convention are:

1. to establish an international regime for conservation, management, and optimum utilization of Pollock resources in the Convention area;
2. to restore and maintain the Pollock resources in the Bering Sea at levels which will permit their maximum sustainable yield;
3. to cooperate in the gathering and examining of factual information concerning Pollock and other living marine resources in the Bering Sea; and
4. to provide, if the Parties agree, a forum in which to consider the establishment of necessary conservation and management measures for living marine resources other than Pollock in the Convention Area as may be required in the future.

Annual meetings and conferences are held.

Evidence Basis: The Convention description can be found here[218], and the objectives here[219]. Annual meeting proceedings can be found here[220]. From the 2015 meeting report[221], it can be seen that recent catches are well below (<5%) the ABC levels (for pollock in the Bogoslof area, an index for the central Bering Sea pollock), and the stock is not subjected to overfishing. No directed pollock fishing has been permitted since 1991.
The North Pacific Marine Science Organization (PICES)[222], 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.

Conclusion:

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

References: Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea 2017, PICES 2017

Non-Conformance Number (if relevant):

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	There is **insufficient** development collaborative technical and research programs to improve	There is **moderate** development of collaborative technical and research programs to improve	The fishery management organizations directly, or in conjunction with other States, develop

[218] Convention https://www.afsc.noaa.gov/REFM/CBS/Docs/Convention%20on%20Conservation%20of%20Pollock%20in%20Central%20Bering%20Sea.pdf

[219] Convention objectives https://www.afsc.noaa.gov/REFM/CBS/convention_description.htm

[220] Convention meeting proceedings https://www.afsc.noaa.gov/REFM/CBS/Default.htm

[221] Convention 2015 annual report https://www.afsc.noaa.gov/REFM/CBS/Docs/20th%20Annual%20Conference/DONUT%202015%20S&T%20Report%20-%20Final.pdf

[222] http://meetings.pices.int/members/scientific-programs

understanding of the biology, environment and status of transboundary aquatic stocks. **Lacking in all parameters.**	understanding of the biology, environment and status of transboundary aquatic stocks. **Lacking in two parameters.**	understanding of the biology, environment and status of transboundary aquatic stocks. **Lacking in one parameter.**	collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if stock in not transboundary in nature.
Process: The collaborative technical and research programs to improve understanding of the biology, environment and status of transboundary aquatic stocks have been developed.
Current Status/Appropriateness/Effectiveness: There is evidence available to substantiate that such cooperation or interaction has taken place. There are data on such collaborations for transboundary aquatic stock understanding.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include outputs resulting from meetings or other research.

Evaluation (per parameter)/: **Process**: Although stock management and fisheries are not transboundary in nature, there is some overlap of the stock between USA and Russian waters. The United States and Russian Federation maintain the bilateral Intergovernmental Consultative Committee (ICC) fisheries forum pursuant to the U.S.-Soviet Comprehensive Fisheries Agreement, signed on May 31, 1988. The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea. The previous clause also outlined the The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, of which USA and Russia are members.

Current Status/Appropriateness/Effectiveness: Cooperation between USA and Russian authorities has occurred as a result of the bilateral ICC. These meetings have resulted in US vessels doing acoustic surveys with Russian Federation scientists in the Federation's zone of the Bering Sea (near Cape Navarin), where a small portion of U.S. pollock moves into.

Evidence Basis: Results of the USA acoustic surveys for pollock in Russian waters are considered as part of the annual stock assessment process as appropriate, e.g. in the 2009 BSAI Groundfish Plan Team Report[223]. See also Fig. 3.1.3 above.

Conclusion:

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

References: NPFMC 2009
Non-Conformance Number (if relevant):

5.5 Data generated by research shall be analyzed and the results of such analyses published in a way that ensures confidentiality is respected, where appropriate.

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** analysis of research data, or publication of that data	There is **insufficient** analysis of research data or publication of	There is **moderate** analysis of research data, or publication of	Data generated by research is analyzed and the results of such

[223] Plan Team Report https://www.afsc.noaa.gov/refm/stocks/plan_team/resources/BSAIPlanTeam_Sep09_minutes.pdf

in a way that ensures confidentiality, where appropriate. **Lacking in all parameters.**	that data in a way that ensures confidentiality, where appropriate. **Lacking in two parameters.**	that data in a way that ensures confidentiality, where appropriate. **Lacking in one parameter.**	analyses published in a way that ensures confidentiality is respected, where appropriate. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows analysis of research data, ensuring, where appropriate, their confidentiality.
Current Status/Appropriateness/Effectiveness: There is evidence data was properly analyzed. Data was published respecting, where appropriate, confidentiality agreements. The rules of confidentiality are effectively respected.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or reports.

Evaluation (per parameter)/:
Process: There is a well-defined public process, coordinated by NPFMC, NFMS, and ADFG that allows extensive analysis of research and relevant commercial fisheries data, ensuring their confidentiality when necessary.

Current Status/Appropriateness/Effectiveness: As documented in some previous sections, 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 pollock fisheries conservation and management. Confidentially is required by Alaska statute and data is redacted in reports when necessary.

Evidence Basis: The pollock 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 CPUE data) is fully respected where necessary. 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 or area were obtained from a small number of participants.

Conclusion:

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

References: NMFS 2017, ADFG 2017
Non-Conformance Number (if relevant):

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 pollock 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 pollock 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 pollock and other 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, including GOA and AI pollock, are in Tier 3, which has sufficient information to determine surrogates for MSY-based reference points. EBS pollock is technically in tier 1, but advice is also provided using the tier 3 rules. 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%. This proxy level is established in the NPFMC FMPs, and has been examined in analyses such as Punt et al. 2014. 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 pollock fishery in Prince William Sound is managed by ADFG and BOF using an annual Guideline Harvest Level (GHL) set as a percentage of the federal ABC for GOA pollock, 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.

Evidence Basis: The BSAI and GOA groundfish fishery management plans[224] 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 target reference points. Based on the information in the 2016 SAFE documents, none of the 4 pollock stocks had overfishing occurring, as per the standard definitions applies to each stock.				
Conclusion:				
Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: NPFMC 2017, Punt et al. 2014.				
Non-Conformance Number (if relevant):				

6.2 States shall establish safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions should be taken to decrease the fishing mortality (or its proxy) below that limit reference point.			
Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No safe limit reference points for exploitation have been established. **Lacking in all parameters.**	Limit reference point is established but considered **insufficiently** safe, and measures taken are **insufficient** to ensure that it will not be exceeded. **Lacking in two parameters.**	Limit reference point is established but considered **moderately** safe, and measures taken are **moderate** to ensure that it will not be exceeded. **Lacking in one parameter.**	There are established safe limit reference point(s) for exploitation (i.e. consistent with avoiding recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible). When a limit reference point is approached, measures are taken to ensure that it will not be exceeded. For instance, if fishing mortality (or its proxy) is above the associated limit reference point, actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. **Fulfils all parameters.**

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

Evaluation Parameters
Process: A scientifically based limit reference point or proxy has been officially established, together with the measure to be taken to ensure it will not be exceeded.

Current Status/Appropriateness/Effectiveness: The stock under assessment shall not currently be overfished (as defined by the competent Alaska authorities) according to the best available scientific understanding. The stock is currently estimated to be on the sustainable side of this reference point (e.g. SSB is above limit reference point, F is below F_{lim}, etc.). The limit reference point or proxy is consistent with avoiding recruitment overfishing and other severe negative impacts on the stock. There are mechanisms in place (e.g. harvest control rule or mechanism) to ensure that the level of fishing pressure is reduced if the limit reference point is approached or reached, and these mechanisms are consistent with ensuring to a high degree of certainty that the limit reference point will not be exceeded and that actions are taken to decrease the fishing mortality (or its proxy) below that limit reference point. The level of Blim should be set on the basis of historical information, applying an appropriate level of precaution according to the reliability of that information. In addition, an upper limit should be set on fishing mortality, Blim, which is the fishing mortality rate that, if sustained, would drive biomass down to the Blim level It is important to clarify that for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska and scored accordingly within the assessment.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter):
Process: National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. Limit reference points for biomass and fishing mortality (harvest rate) have been developed for pollock 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: In the NPFMC tier system, the pollock stocks in EBS, GOA, and AI are currently managed under Tier 3, while Bogoslof pollock is in tier 5, and EBS pollock actually qualifies as in Tier 1 stock. Stocks in tier 3 are further categorized as (a), (b), or (c) based on the relationship between biomass, B40%, and a lower biomass threshold, 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. 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 Tier 3c 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. For pollock and other key species preyed on by SSL, there is an additional limit reference point consideration in the NPFMC Groundfish FMPs, which states that directed fishing is prohibited in the event that the spawning biomass is projected in the stock assessment to fall below B20% in the coming year. This applies to pollock stocks in both BSAI and GOA regions.

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 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 Tier 1 or 3 pollock stocks were below the MSST threshold for biomass, or had overfishing occurring. For GOA, EBS, and AI pollock stocks, it is also possible to determine that these stocks are not overfished or approaching an overfished condition. There is no directed pollock fishing allowed in the Bogoslof area, and little or none is conducted in the AI area in most recent years. For the 2016 analysis conducted on the GOA, EBS, and AI pollock stock

components, there was negligible probability that the spawning biomass would be below B20% in the coming years.

Conclusion:

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

References: NPFMC 2017, 2016 SAFE documents

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

Process: Data and assessment procedures (i.e. stock assessment process) are in place to measure the position of the fishery in relation to the target and limit reference points.

Current Status/Appropriateness/Effectiveness: The current status of the stock in relation to reference points, is used to determine the level of fishing permitted, to ensure the latter is commensurate with the current state of the fishery resources (i.e. close to or above target reference point and most importantly, not overfished or below its limit reference point or proxy) taking into account that long term changes in productivity can occur due to natural variability and/or impacts other than fishing. The stock shall be ideally positioned above the midway point between target and limit reference point. It is important to clarify that, for salmon, spawning escapement goals are a suitable proxy for the intent of this clause. Escapement goal performance shall be considered as a suitable reference point for salmon management. Specific to this point, underperforming salmon

stocks that do not meet their escapement goals shall be appropriately managed within the Stock of Concern framework by the State of Alaska.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports or fishery management plans.

Evaluation (per parameter)/: NMFS/NPFMC has an extensive peer reviewed stock assessment program, which is necessary to monitor and measure the status of the pollock stocks relative to target and limit levels of exploitation and biomass. Extensive oceanographic monitoring and ecosystem modelling is done on stocks in Alaskan waters as part of a number of projects, in order to monitor and predict changes of stock productivity.

Current Status/Appropriateness/Effectiveness: Each 2016 SAFE report for pollock 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, EBS and AI stocks are well above the MSST limit reference point for biomass, and above the B35% (MSY proxy) reference point. None of these 3 stocks is overfished, has overfishing occurring, or is approaching an overfished condition. Bogoslof pollock catches are substantially below the OFL (no directed fishery), and like the other 3 stocks, the stock does not have overfishing occurring.

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, including pollock. 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).

Evidence Basis: The SAFE documents provide full analyses of the status of pollock stocks relative to all available reference points. The table in Section 3.4 above, taken directly from the 2016 SAFE reports for each pollock assessment (e.g. EBS pollock Ianelli et al. 2016)[225], shows the stock status in tabular form for the EBS stock, and similar tables are produced in the other three SAFE reports.

Comprehensive annual Ecosystem Reports for BSAI and GOA are presented to NPFMC, which look at numerous elements of the Alaskan ecosystems. In 2016, a three species stock assessment for pollock, Pacific cod and arrowtooth flounder, was presented for the EBS Region (Holsman et al. 2016)[226]. Results were presented from models estimated and projected with and without trophic interactions and were compared with those from the single species pollock assessment for EBS. The multi-species model showed that EBS pollock biomass remains relatively high and similar to the past 3 years, and model predictions may indicate a slight decline in total and spawning biomass in 2016.

Conclusion:

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

References: Holsman et al. 2016, 2016 EBS pollock SAFE, 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	**Medium Confidence Rating**	**Medium Confidence Rating**	**High Confidence Rating**

[225] EBS pollock SAFE 2016. http://www.afsc.noaa.gov/REFM/Docs/2016/EBSpollock.pdf

[226] Holsman et. al. 2016. https://www.afsc.noaa.gov/REFM/Docs/2016/EBSmultispp.pdf

(Critical NC)	(Major NC)	(Minor NC)	(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 a Harvest Control Rule (HCR) which calls for specific management actions when reference points have been exceeded.

Current Status/Appropriateness/Effectiveness: The NPFMC management of pollock stocks includes HCR based on the reference points described in the previous 2 clauses. This HCR triggers actions by managers to reduce catches when the stock is below B40% i.e. in Tier 3b between B40% and the lower limit specified in Tier 3c, or to set FOFL to 0 when the biomass is below the limit specified in Tier 3c. If the stock is determined to be below the MSST (defined as ½ of B35%), a rebuilding plan must be established to bring the biomass back to the BMSY level within a specified timeframe. In addition, there is a rule for pollock and other key prey species for SSL that triggers when biomass is below B20%. Catch limits for the pollock 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, EBS and AI pollock were set based on the stocks being in Tier 3b for AI, and Tier 3a for the other 2. For Bogoslof pollock, a tier 5 stock, bycatches in 2016 of just over 1000 tons were less than 5% of the ABC, and estimated stock biomass for 2017 from the 2016 SAFE was in excess of 430,000 tons. For the GOA, EBS, and AI stock components, there was negligible probability that the spawner biomass would be below B20% in the coming years.

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 ☐	Medium ☐	High ☑

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: Ianelli et al 2016a, NPFMC 2017				
Non-Conformance Number (if relevant):				

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

FAO CCRF (1995) 7.5.1/7.5.4/7.5.5/12.3
FAO ECO (2009) 29.6/32
FAO Eco (2011) 36.7

7.1 The precautionary approach shall be applied widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. This should take due account of stock enhancement procedures, where appropriate. Absence of scientific information shall not be used as a reason for postponing or failing to take conservation and management measures. Relevant uncertainties shall be taken into account through a suitable method of risk assessment, including those associated with the use of introduced or translocated species[227].

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 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 pollock 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

[227] FAO Technical Guidelines for Responsible Fisheries No.2 – Precautionary approach to capture fisheries and species introductions.

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 pollock 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 pollock 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 PA reference points are established by the NPFMC 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 pollock.

Conclusion:

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

References: NPFMC 2017, 2016 pollock SAFE reports

Non-Conformance Number (if relevant):

7.1.1 In implementing the precautionary approach, States shall take into account, *inter alia*, of uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.

FAO CCRF (1995) 7.5.2

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

There is no implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions. Lacking in all parameters.	There is insufficient implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species, as well as environmental and socio-economic conditions. Lacking in two parameters.	There is moderate implementation of the precautionary approach, taking into account uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as, well as environmental and socio-economic conditions. Lacking in one parameter.	In implementing the precautionary approach, the State takes into account, *inter alia*, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system in place under which the potential uncertainties listed above can be examined and taken into account during the decision-making process.
Current Status/Appropriateness/Effectiveness: There is evidence to demonstrate that in the fishery under assessment, uncertainties considered include those associated with the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependent species as well as environmental and socio-economic conditions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans and other documents.

Evaluation (per parameter)/:
Process: Potential uncertainties in the stock size, reference points, productivity, etc. are taken into account in the assessment process. Uncertainties in the management process re reference points, classification of stocks into precautionary approach tiers, setting of catch levels, etc. are explicit in the NPFMC FMPs.

Current Status/Appropriateness/Effectiveness: Scientists evaluate how fish stocks and user groups might be affected by fishery management actions. The assessments take into account uncertainty in such parameters as survey index data, mean weights at age, and stock-recruit relationship. Analyses evaluate stock status relative to reference points in a probabilistic way, and risks of exceeding reference points at current and projected stock sizes are explicitly presented in the catch option tables in each SAFE report. Extensive research on impacts of fishing, environmental factors, and socioeconomics is presented annually.

The overall objectives of the NPFMC management plans are to prevent overfishing and to optimize the yield from the fishery through the promotion of conservative harvest levels while considering differing levels of uncertainty. The management plan classifies each stock based on a tier system (Tiers 1-6) with Tier 1 having the greatest level of information on stock status and fishing mortality relative to MSY considerations. The harvest control rules associated with these tiers consider the uncertainty associated with each level of information. Acceptable biological catch (ABC) is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty, and the ABC is set below the OFL. Total allowable catch (TAC) is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty. In the NPFMC approach, TAC <= ABC < OFL.

Regarding the distribution of fishing mortality, the pollock fishery is divided into multiple seasons, as noted previously. Additionally, since 1992, the GOA pollock TAC has been apportioned between management areas based on the distribution of biomass in groundfish surveys. Steller sea lion protection measures that were implemented in 2001 require apportionment of pollock TAC based on the seasonal distribution of biomass. Apportioning the TAC spatially distributes the effects of fishing on other pollock predators, such as Steller sea lions, and also ensures that no smaller component of the stock experiences higher mortality than any other (Dorn et al. 2016 SAFE[228]).

Evidence Basis: There are numerous references and examples of how uncertainty is dealt with in the stock assessment of pollock 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.

Conclusion:

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

References: Dorn et al. 2016, NPFMC 2017

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)/:

[228] 2016 GOA pollock SAFE http://www.afsc.noaa.gov/REFM/Docs/2016/GOApollock.pdf

Process: Stock assessments are reviewed on a number of levels, including externally. Where data gaps have been identified, the NMFS/AFSC 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 pollock. Research is also conducted by ADFG on the state-managed pollock.

Current Status/Appropriateness/Effectiveness: The scientific information available for the pollock resources is of a very high standard, and include long time series of catch and fishery data, as well as fishery independent data. The annual NMFS/NPFMC stock assessments are of excellent quality, and are subjected to multiple levels of peer review, 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 Pollock assessment was reviewed by three external reviewers from the CIE during May 16-19, 2016, and several recommendations from this review were incorporated into the 2016 EBS pollock assessment. Similarly, the GOA pollock assessment was reviewed by CIE in 2012, and subsequent assessments of the GOA stock have addressed many of the recommendations contained in that review. The next review of the GOA pollock assessment is scheduled for 2017.

Evidence Basis: The CIE reviews are available on the NMFS website, and are discussed further in Clause 5.1 above. The SAFE documents on pollock assessment have detailed descriptions on how the CIE recommendations are to be dealt with in the assessment process.

Conclusion:

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

References: CIE reviews 2016

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 been made for their gradual introduction and development, by	For new and exploratory fisheries, **insufficiently effective** procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and **insufficient** provisions have been	For new and exploratory fisheries, **moderately effective** procedures are in place for promptly applying precautionary management measures, including catch or effort limits, and **moderate** provisions have been	In the case of new or exploratory fisheries, States adopt as soon as possible cautious conservation and management measures, including, *inter alia*, catch limits and effort limits. Such measures remain in force until there are sufficient data to allow assessment of

establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in all parameters**.	made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in two parameters.**	made for their gradual introduction and development, by establishing cautious conservation measures while sufficient data are collected to evaluate the impacts of the new fishery. **Lacking in one parameter.**	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. **Fulfils all parameters.**

Evaluation Parameters
Note. This clause is only applicable for new or exploratory fisheries.
Process: For new or exploratory fisheries there is a process that allows the immediate application of precautionary management measures and provisions, including catch or effort limits, and for the impact assessment of such fisheries on the long-term sustainability of the stocks.
Current Status/Appropriateness/Effectiveness: There is evidence for the implementation of these catch and effort limits, and other management measures including the impact assessment performed for these fisheries.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data or scientific reports.

Evaluation (per parameter)/: This clause is not applicable, as fisheries for pollock in Alaska are well established.

Conclusion:

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

References: NA
Non-Conformance Number (if relevant):

7.3 Contingency plans shall be agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the fishery resource. Such measures may be temporary and shall be based on best scientific evidence available.

FAO CCRF (1995) 7.5.5

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No contingency plan has been drawn up to introduce temporary management measures to ensure that fishing activity does not exacerbate serious threats to the resource caused by natural phenomena.	A contingency plan has been drawn up to introduce temporary management measures, but it is **insufficiently** effective to ensure that fishing activity does not exacerbate serious threats to the	A contingency plan has been drawn up to introduce temporary management measures, but it is only **moderately** effective to ensure that fishing activity does not exacerbate serious threats to the	Contingency plans are agreed in advance for the appropriate management response to serious threats to the resource as a result of overfishing or adverse environmental changes or other phenomena adversely affecting the

	resource caused by natural phenomena.	resource caused by natural phenomena.	fishery resource. Such measures may be temporary are be 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.

Evaluation (per parameter)/:
Process: There are pre-agreed NPFMC harvest control rules in place to ensure overfishing does not occur on the pollock 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 pollock stock. Stock biomasses are above reference points, and fisheries are performing well. 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) 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"[229].

Conclusion:

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

References: NPFMC 2017
Non-Conformance Number (if relevant):

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

5.4 D. Management Measures

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

FAO CCRF (1995) 7.1.1/7.1.2/7.1.6/7.4.1/7.6.1/7.6.9/12.3
FAO Eco (2009) *29.2/29.4/30*
FAO Eco (2011) 36.2, 36.3

8.1 Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional, fisher or community sources.

FAO CCRF (1995) 7.1.1 Others 7.4.1/7.6.7

FAO Eco (2009) 29.2/29.4

FAO Eco (2011)36.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in all parameters.**	There are **insufficiently effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in two parameters.**	There are **moderately effective** conservation and management measures designed to ensure long term sustainability of fishery resource at levels which promote the objective of optimum utilization based on verifiable and objective information. **Lacking in one parameter.**	Conservation and management measures shall be designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and be based on verifiable and objective scientific and/or traditional, fisher or community sources. **Fulfils all parameters.**

Evaluation Parameters
Process: The process by which management measures are developed for the fishery utilizes the best available scientific evidence, including traditional sources where these are verifiable, and also considers the cost-effectiveness and social impact of potential new measures.
Current Status/Appropriateness/Effectiveness: There is evidence that the management measures in place are effective at achieving the long-term optimum yield, which is defined by the FAO as "the harvest levels for a species that achieves the greatest overall benefits, including economic, social and biological considerations". If the stock has been maintained above the limit reference point this shall be taken as evidence that management measures are effective in avoiding overfishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/: Process: Conservation and management measures in place ensure the long-term sustainability of the resources. FMPs which are based on the Magnuson-Stevens Act have objectives to prevent overfishing and promote sustainable and equitable use of the pollock resource. NPFMC has established a science-based precautionary approach and harvest control rule and based on the scientific assessment of the stock, uses this approach to determine appropriate harvest levels. The process utilizes the best available scientific evidence, and considers the cost-effectiveness and social impact of any potential new measures.

Current Status/Appropriateness/Effectiveness: National Standard 1 of the MSA requires that conservation and fisheries management measures prevent overfishing while achieving optimal yield on a continuing basis. As noted in previous sections, the NMFS and NPFMC follow a multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal pollock fisheries, based on targets, limits, and pre-defined HCRs, as well as overall ecosystem considerations (e.g. the OY limits). The objectives are spelled out clearly in modern FMPs for BSAI and GOA Regions, and both FMPs contain long-term management objectives for the Alaska pollock fishery. The biomass of pollock stocks has been maintained well above the limit reference points, and thus management measures are effective in avoiding overfishing.

The state pollock fishery in Prince William Sound (PWS) is managed by ADFG and BOF using an annual Guideline Harvest Level (GHL) set as a percentage of the federal ABC for GOA pollock, and regulations are spelled out by BOF. The BOF formed a GOA pollock Working Group in 2014, whose goal was to provide BOF with discussion on a state guideline harvest level (GHL) pollock fishery and an explanation of whether and how a state-GHL pollock fishery would protect and maintain Alaska's marine resources and maximize benefits of the state's Gulf of Alaska (GOA) pollock resource. Cooperation exists between federal and state authorities in assessing and managing the pollock stocks.

Evidence Basis: The MSA[230] sets out the standards (e.g. optimal use and avoiding overfishing) which are followed in managing the pollock 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 pollock stocks, including current and projected biomass and fishing mortality, and their position relative to the reference points. Economic considerations are also contained in 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)[231], 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". The BOF pollock WG met several times in 2014-15, and produced a final WG report[232]. Further details pertaining to the pollock fishery in PWS can be found here[233].

Conclusion:

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

References: NPFMC 2017, NMFS 1996, ADFG 2015, Alaska BOF

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)**

[230] MSA http://www.nmfs.noaa.gov/sfa/magact/

[231] BOF state-managed fisheries http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm

[232] ADFG pollock WG http://www.adfg.alaska.gov/index.cfm?adfg=cgoapollockworkgroup.main

[233] ADFG news release PWS pollock fishery http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/758816993.pdf

Management targets are not consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators. **Lacking in all parameters.**	**Management targets are insufficiently consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Lacking in two parameters.**	**Management targets are moderately consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Lacking in one parameter.**	**Management targets are consistent with achieving maximum sustainable yield (MSY) (or a suitable proxy) on average, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.** **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for the creation of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.

Current Status/Appropriateness/Effectiveness**: There is evidence of management targets consistent with achieving MSY or a proxy, or a lesser fishing mortality if that is optimal in the circumstances of the fishery (e.g. multispecies fisheries) or to avoid severe adverse impacts on dependent predators.**
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include stock assessment reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/: **Process**: NPFMC uses a multi-tier precautionary approach to management of pollock, 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 pollock 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. There is also a clause in the NPFMC FMPs that deals specifically with pollock as a key prey for Stellar sea lions (SSL), and what should happen if pollock biomass drops below a certain threshold.

Within Alaskan state waters, ADFG permit a 'parallel fishery'[234] where the state allows fishing against the federal TAC. The state-managed pollock resource within PWS uses a Guideline Harvest Level (GHL), which is determined based on harvest history, fishery performance, and the federal survey for the area, and is currently 2.5% of the GOA pollock ABC. The management plan also restricts bycatch to no more than 5 percent of the total round weight of pollock harvested. Although there is not a full suite of reference points for the pollock fishery in PWS, there are guideline objectives and management measures in place, and the state fisheries appear to be well managed.

[234] ADFG Commercial Fishery webpage http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyfisherygroundfish.main

Evidence Basis: For GOA and EBS pollock, 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 mt[235] while the range for GOA is 116 to 800 thousand mt[236]. To prevent overfishing, NPFMC management objectives include the following measures specific to Optimum Yield: Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield; 2) continue to use the 2 million mt optimum yield cap for the BSAI groundfish fisheries; and 3) provide for adaptive management by continuing to specify optimum yield as a range.

The NPFMC FMPs 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 *B20%* in the coming year". Also, a number of pollock fishery exclusion zones exist around sea lion rookery or haulout sites.

Conclusion:

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

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. **Lacking in all parameters.**	There is **insufficient** evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact. **Lacking in two parameters.**	There is **moderate** evaluation of alternative conservation and management measures with consideration of their cost-effectiveness and social impact. **Lacking in one parameter.**	In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered. **Fulfils all parameters.**

Evaluation Parameters
Process: The process by which management measures are developed for the fishery allows for consideration of the cost-effectiveness and social impact of potential new or modified management measures.
Current Status/Appropriateness/Effectiveness: There is evidence for the consideration of the cost-effectiveness and social impact of potential new or modified management measures.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include reports, fishery management plans, regulations or other management measures.

Evaluation (per parameter)/:

Process: NPFMC FMPs for Alaskan groundfish recognize the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. Since its introduction in 1998, the American Fisheries Act (AFA) has governed the operation of the Alaskan

[235] NPFMC BSAI FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/BSAI/BSAIfmp.pdf
[236] NPFMC GOA FMP http://www.npfmc.org/wp-content/PDFdocuments/fmp/GOA/GOAfmp.pdf

pollock fisheries in the BSAI Region. The CDQ program exists to allocate a portion of allowable catches to coastal communities in Alaska.

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 pollock industry through capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish, and higher valued products. The Pollock Conservation Cooperative (PCC) was formed in December 1998 in order to promote the rational and orderly harvest of pollock by the catcher-processor (CP) sector of the BSAI pollock trawl fishery. Furthermore, 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. The current allocation for pollock is 10% of the BSAI pollock TAC. The effects of such measures on communities is regularly reviewed within NPFMC.

In 2000, 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 (see Clause 2.1.1), CDQ and LLP (see Clause 3.2.1) was presented in earlier clauses. NMFS has numerous reports on the performance of the pollock vessels operating under AFA, including sections in the annual economic SAFE documents noted previously. An extensive report[237] from NPFMC to the US Congress on the impacts of the AFA was presented in 2002, and concluded that the program had been largely successful in meeting its goals. Other reports such as Strong and Criddle (2014)[238] have looked at the impacts of the AFA on pollock markets. The PCC makes an annual report to NPFMC.

Conclusion:

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

References: NPFMC 2002, Strong and Criddle 2014

Non-Conformance Number (if relevant):

8.1.3 Studies shall be promoted which provide an understanding of the costs, benefits and effects of alternative management options designed to rationalize fishing, in particular, options relating to excess fishing capacity and excessive levels of fishing effort.

FAO CCRF (1995) 7.4.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Studies are **not** promoted on the cost, benefits, and effects of alternative	There is **insufficient** promotion of studies on the cost, benefits, and effects of	There is **moderate** promotion of studies on the cost, benefits, and effects of	Studies are promoted which provide an understanding of the costs, benefits and

[237] NPFMC Report to Congress on AFA. https://alaskafisheries.noaa.gov/sites/default/files/congress202.pdf

[238] Strong and Criddle 2014. http://doi.org/10.1080/02755947.2014.944678

management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in all parameters.**	alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in two parameters.**	alternative management options for rationalizing fishing, especially relating to excessive capacity of fishing effort. **Lacking in one parameter.**	effects of alternative management options designed to rationalize fishing, in particular, options relating to excess fishing capacity and excessive levels of fishing effort. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a need and a process that allows, as appropriate, for studies to understand the costs, benefits, and effects of alternative management options designed to rationalize fishing.
Current Status/Appropriateness/Effectiveness: There is evidence for studies conducted on of alternative management options designed to rationalize fishing.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various evaluation or reports on fishing rationalization.

Evaluation (per parameter)/: Process: As noted in the previous clause, the American Fisheries Act (AFA) has governed the operation of the Alaskan pollock fisheries in the BSAI Region since 1998. Formation of cooperatives such as PCC and HSCC have occurred since then.

Current Status/Appropriateness/Effectiveness: The AFA affected the pollock industry in the BSAI Region through capacity reduction, increased efficiency, regulatory bycatch reduction, a higher portion of utilized fish, and higher valued products. Industry cooperatives have been formed to accomplish these objectives. NMFS has numerous analyses on the performance of the pollock vessels operating under AFA, including sections in the annual SAFE reports. The AFA does not apply to GOA pollock, where other measures are in place.

Evidence Basis: The Pollock Conservation Cooperative (PCC) was formed in December 1998 in order to promote the rational and orderly harvest of pollock by the catcher-processor (CP) sector of the BSAI pollock trawl fishery. The PCC is the catcher-processor cooperative, and the High Seas Catchers' Cooperative (HSCC) is a catcher-vessel cooperative, containing all catcher vessels eligible to deliver pollock to CPs. In 1999, the PCC and HSCC completed an inter-cooperative agreement to facilitate efficient management and accurate accounting between the two cooperatives. The organizations make a joint annual report to NPFMC, as noted in Clause 5.1.1. In addition to these, there are 6 shoreside catcher vessel co-ops (Northern Victor Fleet, Peter Pan Fleet, Unalaska Fleet, UniSea Fleet, Westward Fleet, and Akutan Catcher Vessel Association). There is a mothership co-op as well called the Mothership Fleet Cooperative.

An extensive report[239] from NPFMC to the US Congress on the impacts of the AFA was presented in 2002, and concluded that the program had been largely successful in meeting its goals. In the annual economic SAFE reports, an extensive analysis is presented on the Alaskan pollock fisheries. In that 2016 report (Fissel et al. 2016)[240], it is noted that the number of active AFA pollock vessels declined from 147 in the 1996-98 period to 113 in 2000, and has remained around 100 in recent years. As well, since the PCC formed in 1999, catcher/processors are producing about 50 percent more products per pound of fish harvested than in the last year of operations under the 'race for fish' system[241]. A report[242] on the AFA was produced by Northern Economics Inc. for NPFMC in July 2017. The purpose of the review was to describe the socioeconomic impacts of the Bering Sea pollock fishery under the AFA Program.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☑

[239] NPFMC report to Congress on AFA https://alaskafisheries.noaa.gov/sites/default/files/congress202.pdf
[240] 2016 Economic SAFE http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf
[241] Pollock Conservation Coop Report http://www.atsea.org/images/co-oppositionBriefing.pdf
[242] https://www.npfmc.org/wp-content/PDFdocuments/catch_shares/AFA/AFAprogramReviewFinal_0717.pdf

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
References: NPFMC 2002, Fissel et al 2016, PCC 2017, Northern Economics Inc. 2017.				
Non-Conformance Number (if relevant):				

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

FAO CCRF (1995) 8.4.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in all parameters.**	There is **insufficiently** effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in two parameters.**	There is **moderately** effective prohibition of dynamiting, poisoning and other comparable destructive fishing practices. **Lacking in one parameter.**	The State prohibits dynamiting, poisoning and other comparable destructive fishing practices. **Fulfils all parameters.**

Evaluation Parameters
Process: There are management measures, or regulations, or laws that prohibit destructive fishing practices.
Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and enforcement data.

Evaluation (per parameter)/:
Process: Management regulations prohibit destructive fishing practices.

Current Status/Appropriateness/Effectiveness: The regulations or laws effectively prohibit dynamiting, poisoning and other comparable destructive fishing practices, as 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 pollock 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 gears are being used illegally.

Conclusion:

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

8.3 States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery. When deciding on use, conservation and management of the resource, due recognition shall be given, where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood. Arrangements shall be made to consult all the interested parties and gain their collaboration in achieving responsible fisheries. ***FAO CCRF (1995) 7.1.2, 7.1.6, 7.6.6***			
Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource. **Lacking in all parameters.**	**Insufficient** attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource. **Lacking in two parameters.**	**Moderate** attempts have been made to identify and consult with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource. **Lacking in one parameter.**	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. **Fulfils all parameters.**
Evaluation Parameters **Process**: There is a process that allows for identifying and consulting with domestic parties (giving due recognition where relevant, in accordance with national laws and regulations, to the traditional practices, needs and interests of indigenous people and local fishing communities which are highly dependent on these resources for their livelihood) having a legitimate interest in the use and management of fisheries resource. **Current Status/Appropriateness/Effectiveness**: In accordance with national laws and regulations, there is evidence that domestic parties having a legitimate interest in the use and management of the fishery (as described above) have been identified and encouraged to collaborate in the fisheries management process. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include laws, fishery management plans, regulations, and meeting records.			
Evaluation (per parameter)/: General description of evidence in order to score the clause			
Conclusion: **Process**: NPFMC and BOF have processes in place to allow for identifying and consulting with domestic parties having interest in the Alaskan pollock fisheries. **Current Status/Appropriateness/Effectiveness**: The NPFMC is responsible for allocation of the pollock 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 pollock 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 pollock management process has many stakeholders, including Alaska pollock license holders, processors, fishermen's organizations, the states of Alaska, Washington, and Oregon, CDQ groups, and environmental groups. Roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. The NPFMC process is the primary means for soliciting stakeholder information important to the Alaska pollock 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 pollock 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.

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. The purpose of the CDQ Program is to (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska. There are approximately 65 communities within a fifty-mile radius of the BS coastline who participate in the program.

Advisory Committees (AC) are local "grass roots" citizen groups intended to provide a local voice for the collection and expression of public opinions and recommendations on matters relating to the management of fish and wildlife resources in Alaska. ADFG staff regularly attends the AC meetings in their respective geographic areas to provide information to the public and hear local opinions on fisheries related activities. Currently, there are 84 advisory committees in the state. Of these, approximately 80% to 85% are "active", meaning they regularly meet, write proposals, comment and attend BOF meetings.

Evidence Basis: Details on the NPFMC Rural Outreach Committee can be found here[243]. The CDQ information is on the NPFMC website[244]. The enabling statute for the Advisory Committees system is AS 16.05.260. Regulations governing the AC are found in the Alaska Administrative Code (AAC) Title 5, Chapters 96 – 97. More information on BOF and ADFG advisory process can be found here[245].

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

References: NPFMC 2017, BOF/ADFG 2017

Non-Conformance Number (if relevant):

[243] NPFMC Rural Outreach committee http://www.npfmc.org/committees/rural-outreach-committee/

[244] NPFMC CDQ Program http://www.npfmc.org/community-development-program/

[245] BOF/ADFG Advisory process http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory

8.4 Mechanisms shall be established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. Fleet capacity operating in the fishery shall be measured and monitored. States shall maintain, in accordance with recognized international standards and practices, statistical data, updated at regular intervals, on all fishing operations and a record of all authorizations to fish allowed by them.

FAO CCRF (1995) 7.1.8, 7.6.3, 8.1.2, 8.1.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are **not** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in all parameters.**	There is **insufficient** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated statistical data on all fishing operations allowed. Furthermore, mechanisms are **insufficiently** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in two parameters.**	There is **moderate** measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are **moderately** established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Lacking in one parameter.**	There is collection of measurement of fleet capacity operating in the fleet, and maintenance of regularly updated, statistical data on all fishing operations allowed. Furthermore, mechanisms are established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations.
Research has been conducted to determine or estimate the fishing capacity commensurate with the sustainable use of the resource. There are mechanisms in place to measure the total fishing capacity within the Unit of Certification, and to reduce this capacity if it is determined to exceed the sustainable level.
Current Status/Appropriateness/Effectiveness: There is evidence of the size of fleet capacity and of data describing fishing operation and that the mechanisms described above are successful at maintaining the effective fishing capacity of the Unit of Certification at a level commensurate with the sustainable use of the resource. Management mechanisms which restrict the application of fishing capacity, such as quotas, shall be considered valid mechanisms in relation to this parameter.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include, fleet reports or other documents or reports.

Evaluation (per parameter)/:
Process: There is a system to measure fleet capacity and maintain regularly updated data on all fishing operations. There are mechanisms in place to measure the total fishing capacity, and to reduce it if it is determined to exceed the sustainable level. The pollock fishery in the BSAI Region is governed by the provisions of the AFA. 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 (RAM) Program administered by NMFS Alaska Regional Office.

Current Status/Appropriateness/Effectiveness: There is clear evidence from implementation of the AFA that regulating the size of Alaskan fleet capacity has been effective in the Bering Sea pollock fishery. NPFMC and NMFS have determined the fishing capacity commensurate with the sustainable use of the pollock resource, and stocks are above biomass reference points and not overfished in any way. Management mechanisms such as TACs and quota allocations regulate the catch and amount of fishing effort applied to the pollock 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. Access (an effort control) to the fishery is through the Restricted Access Management Program.

Fleet capacity and regularly updated data on all pollock fishing operations are presented in the annual SAFE documents. For example, in the 2016 economic SAFE[246], it is noted that the number of active AFA pollock vessels declined from 147 in the 1996-98 period to 113 in 2000, and has remained around 100 in recent years.

Evidence Basis: The SAFE documents (assessments and economic reports), the AFA, and NPFMC Groundfish FMPs for GOA and BSAI, documented in several previous clauses, provide the necessary evidence. Information on the Alaska Licence Limitation Program can be found here[247]. The Restricted Access Management Program (RAM)[248] is responsible for managing Alaska Region permit programs, including those that limit access to the Federally-managed fisheries of the North Pacific.

Conclusion:

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

References: Fissel et al 2016, NMFS/LLP 2017, 2016 pollock SAFE reports

Non-Conformance Number (if relevant):

8.5 Technical measures shall be taken into account, where appropriate, in relation to:

- fish size
- mesh size or gear
- closed seasons
- closed areas
- areas reserved for particular (e.g. artisanal) fisheries
- protection of juveniles or spawners

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in all parameters.**	**Insufficient** technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in two parameters.**	**Moderate** technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Lacking in one parameter.**	Technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners. **Fulfils all parameters.**

Evaluation Parameters

Process: The management system has taken into account technical measures, where and as appropriate to the fishery and stock under assessment, in relation to fish size, mesh size or gear,

[246] 2016 Economic SAFE http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf
[247] LLP Program https://alaskafisheries.noaa.gov/fisheries/llp
[248] RAM Program contact https://alaskafisheries.noaa.gov/ramcomment

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)/: The management system has taken into account various technical measures, where and as appropriate to the fishery and stock under assessment, in relation to fish size, fishing gear, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, and protection of juveniles or spawners.

Current Status/Appropriateness/Effectiveness: There have been numerous regulations, as well as technological developments, aimed at reducing waste and discards in the pollock 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 the split of the BS Pollock TAC into A and B seasons, both SE and NW of 170 degrees longitude, to allow harvest of roe-bearing pollock at appropriate times and thereby reduce wastage, the development of Chinook and chum salmon excluder devices for trawl gear to reduce these by-catches, and closures of large areas to protect numerous ETP species. Since 1998, full retention of pollock is required in all Alaskan fisheries under the Improved Retention/Improved Utilization (IRIU) program. Since implementation of the AFA, vessel operators often pursue optimal sizes of pollock for market since the quota is allocated to vessels via cooperative arrangements. In addition, several vessels have made various gear modifications to avoid retention of smaller pollock.

Regarding the endangered Steller sea lions (SSL), the NPFMC has acted in a precautionary manner to place protections around rookeries and haulouts and close areas where fishing may impact SSL prey such as pollock. Over 210,000 km2 (54%) of critical sea lion habitat is closed to the pollock fishery in BSAI, with further restrictions on the proportion of annual pollock TAC which can be removed from the BSAI SSL Conservation Area. In the Central and Western GOA the SSL protection measures implemented in 2001 established four seasons beginning January 20, March 10, August 25, and October 1, with 25% of the total TAC allocated to each season. ADFG has also implemented areas closed to fishing in PWS around SSL rookeries.

Amendment 91 is described as "an innovative approach to managing Chinook salmon bycatch in the BSAI pollock fishery that combines a limit on the amount of Chinook salmon that may be caught incidentally with incentive plan agreements and performance standard. The program was designed to minimize bycatch to the extent practicable in all years, and prevent bycatch from reaching the limit in most years, while providing the pollock fleet with the flexibility to harvest the total allowable catch". NMFS implemented this program for the 2011 BSAI pollock fishery, and in 2015 NPFMC passed a number of salmon bycatch reduction measures (Amendment 110) for implementation in 2016-2017. This included incorporation of chum salmon avoidance into Amendment 91 Incentive Plan Agreements, requirement for salmon excluder devices, establishment of penalties for vessels that consistently have high bycatch relative to the fleet, adjustments to seasonal allocations, and lowering the hard cap and performance standard by 25% in years of low Chinook abundance. In the EBS, Chinook salmon bycatch in 2015 was 54% of the 2003-2015 mean value consistent with the magnitude of bycatch since the implementation of Amendment 91 in 2011. Ianelli and Stram (2014) provide estimates of the bycatch impact on Chinook salmon runs to the coastal west Alaska region and found that the peak bycatch levels exceeded 7% of the total run return. Since 2011, the impact has been estimated to be <2%.

In 2016, Amendment 110 was implemented to improve the management of Chinook and chum salmon bycatch in the Bering Sea pollock fishery by creating a comprehensive salmon bycatch avoidance program. This action is necessary to minimize Chinook and chum salmon bycatch in the Bering Sea pollock fishery to the extent practicable while maintaining the potential for the full harvest of the pollock total allowable catch (TAC) within specified prohibited species catch (PSC) limits.

Only pelagic trawls can be used in pollock fisheries in the BSAI region, and the doors used in the pelagic trawls used in the pollock fisheries in Alaska have negligible bottom impacts. Although the net does sometimes contact the seabed, benthic or bottom species by-catch is quite low, as are discard rates. The pollock conservation cooperative (PCC) continues to work on reducing the incidental catch of non-

pollock species. The PCC contracts with a private sector firm, Sea State, Inc. to monitor incidental catch, and is permitted to download proprietary catch data submitted to NOAA Fisheries on a real time basis. Sea State reviews this data and advises vessel operators of bycatch "hotspots" to avoid. Harvest cooperative members cease fishing in an area if bycatch is encountered and move to other fishing grounds.

Evidence Basis: Substantial detail on the management measures are contained in the GOA and BSAI FMPs from NPFMC, as documented in previous clauses. Specific information on the IRIU program regulations can be found here[249]. Information on Chinook salmon bycatch management in Alaskan pollock fisheries in BSAI, including links to amendments 91 and 110, can be found here[250]. A pdf copy of the Ianelli and Stram (2014) paper[251] on impact of bycatch on Chinook salmon runs is available on the NPFMC website. Information on the PCC and measures to avoid bycatch can be found here[252].

Conclusion:

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

References: NMFS/IRIU 2017, NMFS 2017, Ianelli and Stram 2014, PCC 2017

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. **Lacking in all parameters.**	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. **Lacking in two parameters.**	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. **Lacking in one parameter.**	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. **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. Only pelagic trawl gear is allowed in the BSAI pollock fisheries.

[249] IRIU https://alaskafisheries.noaa.gov/sites/default/files/679b27.pdf
[250] NMFS 2017 https://alaskafisheries.noaa.gov/fisheries/chinook-salmon-bycatch-management
[251] Ianelli and Stram 2014. https://www.npfmc.org/wp-content/PDFdocuments/resources/PollockImpacts2014.pdf
[252] Pollock Conservation Coop Report http://www.atsea.org/images/co-oppositionBriefing.pdf

Current Status/Appropriateness/Effectiveness: Fixed gear is marked according to regulations, which state:

(a) Marking of hook-and-line, longline pot, and pot-and-line gear.

(1) All hook-and-line, longline pot, and pot-and line marker buoys carried on board or used by any vessel regulated under this part shall be marked with the vessel's Federal fisheries permit number or ADFG vessel registration number.

(2) Markings shall be in characters at least 4 inches (10.16 cm) in height and 0.5 inch (1.27 cm) in width in a contrasting color visible above the water line and shall be maintained so the markings are clearly visible.

Evidence Basis: Regulations pertaining to vessel and gear markings in the pollock fishery are established in NMFS and ADFG regulations, e.g. as prescribed in the annual management measures published in the Federal Register[253]. There was no evidence raised/available that indicated the marking of gear is not being followed, or is not effective.

Conclusion:

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

References: NMFS 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. **Lacking in all parameters.**	There is **insufficient** allowance for recovery or active restoration for depleted stocks, resources and habitats critical to the well-being of such resources which have been adversely affected by fishing or other human activities.	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.

[253] NMFS Regulations on fishing gear https://alaskafisheries.noaa.gov/sites/default/files/679b24.pdf

	Lacking in two parameters.	Lacking in one parameter.	Fulfils all parameters.
Evaluation Parameters **Process**: There is a process that identifies depleted stocks, resources and habitats. A depleted stock is usually a stock which had undergone overfishing. Accordingly, stock status is below limit reference point and the ability of the stock to recover has been impaired. **Current Status/Appropriateness/Effectiveness**: There is evidence that where depleted or adversely affected stocks, resources and habitats have been identified, efforts have been made to ensure they are restored or allowed to recover. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include laws and regulations, fishery management plans, and stock assessment reports.			
Evaluation (per parameter)/: **Process**: The US laws governing the pollock 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 multi-faceted PA (OFL, ABC, TAC, OY) to manage the federal pollock 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. The Environmental Impact Statement on Essential Fish Habitat (EFH) provides estimates of impact of the pelagic trawl gear used in the BSAI pollock fishery, which indicated that the fishery was highly unlikely to result in serious or irreversible harm to habitat structure. Specific measures for chinook and chum salmon, as well as Steller sea lions exist in the pollock fishery regulations. **Current Status/Appropriateness/Effectiveness**: None of the pollock stocks in Alaska are classified as overfished or undergoing overfishing, and none are in a depleted state. Directed fishing for pollock has been prohibited since 1993. Only pelagic trawls are used in the BSAI pollock fishery and no destructive fishing practices are allowed in GOA or BSAI which would adversely impact habitat. With regard to other resources taken in the pollock fishery, considerable work has been done on studying the effects on Chinook salmon in the EBS, as there are concerns with the status of Chinook in many rivers. There is ongoing scientific sampling and genetic analyses of the Chinook salmon taken in the pollock fisheries in the GOA and EBS to determine their origins. In 2011, the NMFS implemented a hard cap on Chinook salmon bycatch in the EBS pollock fishery (Amendment 91), which was a significant step towards controlling and ultimately reducing bycatch. The NPFMC developed incentive plan agreements to keep bycatch lower than the BSAI Chinook cap level, and these agreements include explicit incentives and penalties for the pollock fleet to avoid Chinook salmon in all conditions. In June 2016, the final rule for Amendment 110 to the FMP for groundfish of the BSAI management area was published[254]. The rule will improve the management of Chinook and chum salmon bycatch in the BSAI pollock fishery by creating a comprehensive salmon bycatch avoidance program. **Evidence Basis:** The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Donut Hole) is responsible for the conservation, management, and optimum utilization of pollock resources in the high seas area of the Bering Sea. Member states have maintained a moratorium on commercial pollock fishing in the Convention Area since 1993 in an effort to allow the stock to rebuild (see Clause 5.3 for additional details). Based on the analysis of 1,385 Chinook salmon bycatch samples collected throughout the 2014 BSAI pollock trawl fishery, Coastal Western Alaska stocks dominated the sample set (49%) with smaller contributions from North Alaska Peninsula (18%), British Columbia (14%), and West Coast U.S. (WA/OR/CA) (7%) stocks. Analysis of the pollock "A" and "B" seasons revealed changes in stock composition during the course of the year with lower contributions of Coastal Western Alaska, North Alaska Peninsula and Yukon stocks and higher contributions of West Coast U.S. (WA/OR/CA), British Columbia, NW Gulf of Alaska and Coastal Southeast Alaska stocks during the "B" season (Guthrie et al. 2016)[255]. For areas which comprised 84% of the GOA chinook bycatch in 2013, the proportions of			

[254] Amendment 110 text 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

[255] Guthrie et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-310.pdf

reporting groups were determined to be as follows: British Columbia (43%), U.S. West Coast (42%), coastal Southeast Alaska (11%), Northwest GOA (3%), and others (< 1%) (Guyon et al. 2015)[256].

The analysis of 1,741 chum salmon collected throughout the 2014 BS trawl fishery, showed that the largest stock group in the catch was Northeast Asia (37%), followed by Eastern GOA/Pacific Northwest (PNW) (24%), Southeast Asia (19%), Western Alaska (18%), Upper/Middle Yukon (2%), and Southwest Alaska (< 1%) stocks (Kondzela et al. 2016)[257]. A similar analysis was recently completed on the 2015 fishery[258]. The regional stock estimates for the 2015 chum salmon caught in the Bering Sea differed from most previous years, with contributions from Eastern GOA/PNW stocks surpassing those from Northeast Asia and Southeast Asia stocks.

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 pollock fisheries. These are discussed in detail in Clause 8.5 above.

Conclusion:

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

References: Amendment 110 Federal Register 2016, Guthrie et al 2016, Guyon et al. 2015, Kondzela et al 2016, Kondzela et al. 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.

FAO CCRF (1995) 7.2.2, 7.6.4, 7.6.9, 8.4.5, 8.5.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There is **no** encouragement for the development, implementation and use of selective, environmentally safe and cost effective gear, technologies and techniques that are sufficiently selective as to increase survival rates of escaping fish, minimize catch, waste and discards of non-target species - both fish and non-fish species, and impacts on associated or dependent species.	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.	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.	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

[256] Guyon et al. 2015. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-291.pdf
[257] Kondzela et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-314.pdf
[258] Kondzela et al. 2017. https://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-345.pdf

Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	dependent species. The use of fishing gear and practices that lead to the discarding of catch are discouraged and the use of fishing gear and practices that increase survival rates of escaping fish are promoted. Inconsistent methods, practices and gears are phased out accordingly. **Fulfils all parameters.**

Evaluation Parameters

Process: The management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to reduce waste and discard of the target species. 'Relevant groups' includes fishers, processers, distributers and marketers. There are mechanisms in place by which the selectivity, environmental impact and cost-effectiveness of gears included in the Unit of Certification are measured.

Current Status/Appropriateness/Effectiveness: Such technologies and operational methods have been implemented. The methods in use are effective in reducing waste and discards of the target species. There is evidence that the gears used in the fishery are appropriate, in terms of selectivity, environmental impact and cost-effectiveness, as assessed by the responsible scientific authority of the fishery. Methods shall be considered successful if there is evidence that the fishery under assessment is not causing significant risk of overfishing to non-target species.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various reports, regulations or other data.

Evaluation (per parameter)/: **Process**: The NPFMC/NMFS/ADFG management system and relevant groups from the fishing industry have encouraged the development of technologies and operational methods to improve gear selectivity, and to reduce waste and discard of the target species, such as the IRIU program, and utilization of distinct annual time periods (seasons) to manage the fisheries. The selectivity, environmental impact and cost-effectiveness of fishing gears is measured, analysed, and monitored in a number of ways, including extensive analysis and reporting of data in the SAFE documents, the EFH work, and at-sea enforcement of regulations.

Current Status/Appropriateness/Effectiveness: Numerous technologies and operational methods have been implemented in the pollock fisheries to reduce waste and discards of the target species. For the Alaskan pollock fisheries, discarding is extremely low. The pelagic trawl fisheries for pollock account for very low bycatches of most species, including marine mammals and seabirds. The NPFMC measures for Chinook and chum salmon bycatch reduction implemented in 2016 require, among other actions, the use of salmon excluder devices. A number of studies have been carried out, and/or are ongoing on trawl-mounted devices to exclude chum and chinook salmon in the pollock fisheries in GOA and BSAI.

Evidence Basis: Although the Alaskan pollock fisheries are conducted with pelagic trawl (100% in BSAI and PWS; about 90% in GOA), parts of the trawl gear do come into contact with the seabed and consequently there are catches of groundfish and other demersal species. However, the pelagic trawl fisheries for pollock account for very low bycatches of most species, including marine mammals (Muto et al. 2016)[259] and seabirds. For example, combined by-catches of "other target species" such as cod, flatfish, ocean perch, skates, squids etc. were in total, less than 2% of the pollock catch in BSAI in 2014 and 2015 (see Table 3.1.1 above, from 2016 SAFE). None of these species/groups are considered to be overfished or subjected to overfishing, based on the 2016 SAFE documents. There are numerous regulations in place to regulate and control bycatch, as well as the industry initiatives described in Clause 8.5 above. As well, for the pollock fisheries, discarding is low, verified by observer data. For example, in the observer report for the 2015 fishery[260], Table 4.3 shows that for the 1.18 million tons of pollock caught in the BSAI by catcher and catcher processor vessels in 2015, only 3,917 t of total

[259] Muto et al. 2016. http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-323.pdf

[260] NMFS. 2016. Observer Program Reports. Annual Deployment Plans and Reports. https://alaskafisheries.noaa.gov/fisheries/observer-program-reports

discards was recorded, which is < 0.4% of total catch, similar to the discard rate in the 2014 fishery recorded by observers.

A number of studies on the use of gear technology e.g. those conducted under the North Pacific Fisheries Research Foundation[261], have been carried out on specifically on trawl-mounted devices to exclude salmon in the pollock fisheries in GOA and BSAI. PCC continues to conduct research on pollock vessels in BSAI with regard to efficiency of excluder devices, examining factors such as light attraction, "flapper panels", and escape ports[262].

Amendment 103 to the GOA FMP, passed in September 2016[263], 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-caught Chinook salmon PSC. NPFMC are considering additional management measures to address the Chinook limits for some GOA fisheries.

Conclusion:

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

References: Muto et al 2016, NMFS 2016, Gauvin 2013, NPFRF 2017, NOAA, SAFE documents 2016

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 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.**	Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques are **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.**	Technologies, materials and operational methods or measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques are applied to minimize the loss of fishing gear, the ghost fishing effects of lost or abandoned fishing gear, pollution and waste. **Fulfils all parameters.**

[261] Gauvin 2013 -NPFRF– Salmon Excluder EFP 11-01 Final Report June 2013 http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

[262] Chinook bycatch http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

[263] Amendment 103 to GOA FMP . https://alaskafisheries.noaa.gov/sites/default/files/81fr62659.pdf

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 pollock 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 pollock fisheries in Alaska. Thus there is no ghost fishing from these forms of fishing gear in the pollock fisheries. As well, there is minimal gear loss in the main gear used in Alaskan pollock fisheries (pelagic trawl), given that the reduced bottom contact from trawl doors greatly reduces snagging and subsequent loss of trawls on the seabed.

Evidence Basis: NPFMC FMPs outline the allowable fishing gears allowed in the Alaskan pollock fisheries. Evidence provided by fishing fleets indicates that lost fishing gear is minimal. A NOAA study[264] shows ghost fishing mortality and gear loss for derelict trawl (and other gears such as longline) are likely to be lower in comparison to gillnets and trap gears, although less in known of the effects of derelict trawls and longlines.

Conclusion:

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

References: NOAA 2015
Non-Conformance Number (if relevant):

8.10 The intent of fishing selectivity and fishing impacts related regulations shall not be circumvented by technical devices and information on new developments and requirements shall be made available to all fishers.

FAO CCRF (1995) 8.5.1

Low Confidence Rating (Critical NC)	Medium Confidence Rating (Major NC)	Medium Confidence Rating (Minor NC)	High Confidence Rating (Full Conformance)
Information on new developments and requirements is **not** made available to all fishers.	Information on new developments and requirements is **insufficiently** made available to all fishers.	Information on new developments and requirements is **moderately** made available to all fishers.	The intent of fishing selectivity and fishing impacts related regulations is not circumvented by technical devices and information on new developments and

[264] NOAA ghostfishing document https://marinedebris.noaa.gov/sites/default/files/publications-files/Ghostfishing_DFG.pdf

Lacking in all parameters.	**Lacking in two parameters.**	**Lacking in one parameter.**	requirements is made available to all fishers. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a system that makes available information on new developments and requirements to all fishers to avoid circumvention of fishing regulation.
Current Status/Appropriateness/Effectiveness: The adopted methods are successful and effective making known fishing regulation to the participants. Enforcement data are highlighting significant violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Evaluation (per parameter)/: **Process**: Information on gear regulations, including any and all amendments or modifications, as well as on gear technology is readily available to fishers and the general public through the websites of NPFMC, NOAA/NMFS, and ADFG, and through various meetings, mailouts, etc. Fishing gear is regulated and monitored through these agencies, and data on compliance is recorded and published.

Current Status/Appropriateness/Effectiveness: There is no evidence that regulations involving gear selectivity in the pollock fisheries are being circumvented either by omission, or through the illegal use of gear technology. Advancements or developments in gear are made widely available to fishers through websites and public meetings and other forms of communication. As noted in earlier clauses, there is minimal by-catch and discarding in the pollock fisheries. Use of salmon excluder devices is generally thought not to negatively impact the selectivity of the trawls toward pollock, and are designed not to impede escaping pollock or salmon.

Evidence Basis: As reported by Gauvin et al. (2013)[265] in work conducted under the North Pacific Fisheries Research Foundation, salmon excluder designs have evolved considerably since experimental trials in the Bering Sea pollock fishery started in the fall of 2003. Design changes have been influenced by a suite of exempted fishing permit (EFP) tests and by feedback from fishermen using the various designs over the years since the EFPs started. NPFMC has incorporated the use of excluder devices into their management measures, as noted in amendment 110. Further developmental work is ongoing on these salmon excluder devices for both chum and chinook under PCC funding.

Conclusion:

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

References: Gauvin et al. 2013
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	The implications of commercial scale	The implications of commercial scale	Assessment and scientific evaluation is

[265] Gauvin et al. 2013 NPFRF http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

introductions of a new gear or fishing operations on the fish habitat are **not** considered prior to its introduction. **Lacking in all parameters.**	introductions of a new gear or fishing operations on the fish habitat are **insufficiently** considered prior to its introduction. **Lacking in two parameters.**	introductions of a new gear or fishing operations on the fish habitat are **moderately** considered prior to its introduction. **Lacking one parameter.**	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 considered applicable as no new gears have been introduced on a commercial scale in the last 3 years. However, in the state-managed pollock fishery in GOA, BOF experimental permits have been issued for purse seining pollock in some areas, although catches have been minimal in the trials conducted thus far, and no BOF management measures allowing purse seining of pollock have been introduced[266]. Data have been collected on pollock and other species such as chinook salmon in the test fisheries thus far to allow some evaluation, but a proposal to BOF to allow purse seine fishing for pollock in some state-managed waters was not accepted[267].

Conclusion:

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

References: ADFG 2015, BOF 2016
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)**

[266] ADFG 2015 http://www.adfg.alaska.gov/static-f/regulations/regprocess/fisheriesboard/cgoapollockworkgroup/pdfs/pollock_final_report.pdf
[267] BOF proposal http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/2015-2016/proposals/groundfish_213-194.pdf

International cooperation is not encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in all parameters.	International cooperation is insufficiently encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in two parameters.	International cooperation is moderately encouraged for research programs for fishing selectivity and fishing methods strategies, and dissemination of information and technology transfer. Lacking in one parameter.	International cooperation is encouraged with respect to research programs for fishing gear selectivity and fishing methods and strategies, dissemination of the results of such research programs and the transfer of technology. Fulfils all parameters.

Evaluation Parameters
Process: There is a system of international information exchange to allow knowledge to be shared
Current Status/Appropriateness/Effectiveness: There is evidence for international information exchange, such as meeting records or other information.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Evaluation (per parameter)/: Process: The fishery for pollock in Alaska is conducted by US vessels only. In adjacent waters of the Bering Sea cooperation on pollock research and management between Russia and USA occurs as part of the science and management process. Both countries are also members in the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Donut Hole).

Current Status/Appropriateness/Effectiveness: One of the Convention objectives is "to cooperate in the gathering and examining of factual information concerning Pollock and other living marine resources in the Bering Sea". The United States and Russian Federation also maintain the bilateral Intergovernmental Consultative Committee (ICC) fisheries forum pursuant to the U.S.-Soviet Comprehensive Fisheries Agreement, signed on May 31, 1988. This has resulted in cooperative research on pollock in the Bering Sea.

Evidence Basis: Evidence, including meeting reports, on the Russia-USA cooperation, and participation in ICC and Convention meetings can be found in Clauses 5.3 and 5.4.

Conclusion:

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

References: Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea 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 been decided by States and relevant institutions involved. **Lacking in all parameters.**	There are **insufficient** standard methodologies developed for studies on fishing gear selectivity and methods been decided by States and relevant institutions involved. **Lacking in two parameters.**	There are **moderate** standard methodologies developed for studies on fishing gear selectivity and methods been decided by States and relevant institutions involved. **Lacking in one parameter.**	States and relevant institutions involved in the fishery collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behavior of target and non-target species in relation to such fishing gear as an aid for management decisions and with a view to minimizing non-utilized catches. Fulfils all parameters.

Evaluation Parameters
Process: There is collaborative research into fishing gear selectivity, fishing methods and strategies.
Current Status/Appropriateness/Effectiveness: There is evidence of such research, and the results have been applied accordingly in fisheries management.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data and reports.

Evaluation (per parameter)/: There is considerable collaborative research into fishing gear selectivity, fishing methods and strategies in the pollock 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)[268] in work conducted under the North Pacific Fisheries Research Foundation, salmon excluder designs have evolved considerably since experimental trials in the Bering Sea pollock fishery started in the fall of 2003. Design changes have been influenced by a suite of exempted fishing permit (EFP) tests and by feedback from fishermen using the various designs over the years since the EFPs started. NPFMC has incorporated the use of excluder devices into their management measures, as noted in amendment 110. Developmental work is ongoing on these salmon excluder devices for both chum and chinook.

Conclusion:

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

References: Gauvin et al. 2013

Non-Conformance Number (if relevant):

[268] Gauvin et al. 2013 NPFRF -http://www.npfrf.org/uploads/2/3/4/2/23426280/salmon_excluder_efp_11-01_final_report-1.pdf

Not applicable

8.14 Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States shall ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed.

FAO CCRF (1995) 8.11.1, 8.11.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **No** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in all parameters.**	There are **insufficiently** effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **Insufficient** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in two parameters.**	There are **moderately** effective policies developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. **Moderate** care has been taken in the selection of materials to use in constructing artificial reefs, in the selection of sites for their deployment, or to ensure that relevant conventions concerning the environment and the safety of navigation have been observed. **Lacking in one parameter.**	Policies are developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. States ensure that, when selecting the materials to be used in the creation of artificial reefs as well as when selecting the geographical location of such artificial reefs, the provisions of relevant international conventions concerning the environment and the safety of navigation are observed. Fulfils all parameters.

Evaluation Parameters

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

Process: There is a mechanism in place for identifying potential for increasing stock populations and enhancing fishing opportunities through the use of artificial structures. This mechanism ensures that where artificial structures are deemed appropriate, environmental protection, safety, and navigation are considered in their application.

Current Status/Appropriateness/Effectiveness: This mechanism has been applied to the fishery under assessment, resulting either in the conclusion that artificial structures are inappropriate or in the use of artificial structures. Care has been taken in the selection of materials to use in constructing artificial reefs, the selection of sites for their deployment and to ensure that relevant conventions concerning the environment and the safety of navigation have been observed.

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

Evaluation (per parameter)/: This clause is not applicable to pollock

Conclusion:

Evidence Rating:	Low ☐	Medium ☐	High ☐

Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☐
References:				
Non-Conformance Number (if relevant):				

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

FAO CCRF (1995) 8.1.7/8.1.10/8.2.4/8.4.5

9.1 States shall enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs shall take into account agreed international standards and guidelines.

FAO CCRF (1995) 8.1.7/8.4.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in all parameters.**	**Insufficiently** effective education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in two parameters.**	**Moderately** effective education and training programs for fishers have been implemented that meet international standards and guidelines. **Lacking in one parameter.**	States enhance through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Such programs take into account agreed international standards and guidelines. **Fulfils all parameters.**

Evaluation Parameters
Process: There are implemented education programs for fishers.
Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.

Evaluation (per parameter)/:
Process: There are several available education programs for fishers.

Current Status/Appropriateness/Effectiveness: The North Pacific Fishing Vessel Owners Association (NPFVOA) provides a large and diverse training program that many of the professional crew members must pass. Training ranges from firefighting on a vessel, damage control, man-overboard, MARPOL, etc., and the Sitka-based Alaska Marine Safety Education Association alone has trained more than 10,000 fishermen in marine safety and survival through a Coast Guard-required class on emergency drills. Captains and some officers on the larger pollock vessels require certain levels of navigational certification. The State of Alaska, Department of Labor & Workforce Development (ADLWD) includes AVTEC (formerly called Alaska Vocational Training & Education Center, now called Alaska's Institute of Technology). One of AVTEC's main divisions is the Alaska Maritime Training Center, which promotes safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry.

Also, the University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several sectors, including fisheries management, in the forms of seminars and workshops. MAP also conducts sessions of their Alaska Young Fishermen's Summit. In addition to this, MAP provides training and technical assistance to fishermen and seafood processors in Western Alaska. A number of

training courses and workshops were developed in cooperation with local communities and CDQ groups. Additional education is provided by the Fishery Industrial Technology Center, in Kodiak, Alaska.
Evidence Basis: NPFVOA[269], AVTEC[270] , University of Alaska Sea Grant Marine Advisory Program (MAP)[271], Fishery Industrial Technology Center[272]

Conclusion:

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

References: NPFVOA 2017, AVTEC 2017, UAF SeaGrant MAP 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. **Lacking in all parameters.**	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. **Lacking in two parameters.**	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. **Lacking in one parameter.**	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. **Fulfils all parameters.**

[269] NPVOA homepage http://npfvoa.org/
[270] AVTEC homepage http://www.avtec.edu/
[271] UOA Sea Grant MAP http://seagrant.uaf.edu/map/fisheries/
[272] Fishery Industrial Technology Center http://www.sfos.uaf.edu

Evaluation Parameters
Process: There are relevant measures of the code and other applicable environmental and other standards being exposed to fishers for their training.
Current Status/Appropriateness/Effectiveness: These programs are effective in training fishers, in line with international standards and guidelines and key CCRF principles.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data, websites.

Evaluation (per parameterProcess: All regulations governing the pollock fisheries are available on the NPFMC and NMFS 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 pollock fisheries, including those dealing with responsible fishing methods, are readily available on NMFS, NPFMC, and ADFG websites. To increase communications and understanding between the regulated users and enforcement personnel, the Alaska Enforcement Division (AKD) of NOAA Fisheries Office of Law Enforcement (OLE) strives to maintain a positive and productive relationship with all harvesters and industry personnel. In addition to daily personal interactions on the water, docks, and in processing facilities, AKD contacts thousands of harvesters and industry personnel at organized events, including trade shows, and responded to email and telephone inquiries, providing current regulatory information and guidance to promote compliance and responsible fisheries.

Evidence Basis: A summary of the NPFMC management measures that govern the GOA and BSAI groundfish fisheries are contained in the FMPs for those two regions. These also cover legal definitions such as quota shares, IFQ's, etc. The full suite of NMFS fishery regulations for Alaskan waters can be found on the NMFS website[273]. These regulations cover all aspect of fishing, including seasons, gear limitations, and numerous area closures.

Conclusion:

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

References: NMFS 2017
Non-Conformance Number (if relevant):

9.3 States shall, as appropriate, maintain records of fishers which shall, whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with their national laws.

FAO CCRF (1995) 8.1.8

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** records kept of fishers, including 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

[273] NMFS 2017 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[274]. Information on Alaska sport fish and crew license holders has been compiled through the Alaska Fisheries Information Network for Alaska Fisheries (AKFIN)[275] . Data on fishing in Alaskan state-managed fisheries can be found in the State of Alaska's CFEC website[276]. Subpart F deals specifically with the American Fisheries Act and Aleutian Island Directed Pollock Fishery Management Measures. USCG also maintains records and issues credentials on licenses for crewmembers, including engineers, captains, mates, deckhands, etc. State of Alaska issues commercial fishing licenses for all crew.

Conclusion:

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

References: Fissel et al. 2016, AKFIN 2017, CFEC 2017
Non-Conformance Number (if relevant):

[274] Fissel et al. 2016 Economic SAFE http://www.afsc.noaa.gov/refm/docs/2016/economic.pdf
[275] AKFIN http://www.akfin.org/home/
[276] 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)**
There are **no** mechanisms established for fisheries monitoring, surveillance and control. **Lacking in all parameters.**	There are **insufficiently** effective mechanisms established for fisheries monitoring, surveillance and control. **Lacking in two parameters.**	There are **moderately** effective mechanisms established for fisheries monitoring, surveillance and control. **Lacking in one parameter.**	Effective mechanisms are established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programs, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. **Fulfils all parameters.**

Evaluation Parameters
Process: There are mechanisms established for fisheries monitoring, surveillance, control and enforcement.
Current Status/Appropriateness/Effectiveness: These mechanisms are effective, and include effective observer, inspection scheme, and vessel monitoring schemes where appropriate for the type of fishery under assessment. Monitoring, surveillance, control and enforcement mechanisms can be considered effective if they are sufficiently broad to cover the entirety of the Unit of Certification, there is evidence that rules and regulations are consistently enforced, and there is no evidence of frequent or widespread violation of fishery regulations. This could include relevant traditional, fisher or community approaches, provided their performance could be objectively verified. With respect to fisheries in the high seas, the legal obligations of UNCLOS and UNFSA have particular relevance. Evidence of the performance of the legal framework can be derived from the assessment of conformance with requirements covering compliance and enforcement.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include rules and regulations, enforcement reports.

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

Process:

The US Coast Guard (USCG)[277], NMFS Office of Law Enforcement (OLE)[278] and Alaska Wildlife Troopers (AWT)[279] (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 operation[280] within the fisheries and developmental work is on-going with respect to additional electronic monitoring (EM) technologies[281].

Current Status/Appropriateness/Effectiveness:
Monitoring, control and surveillance (MCS) is carried out at-sea and shore-side for the federal fisheries by the OLE[282] and the USCG[283] (17th District USCG). The AWT[284] fulfills the MCS function for the state water fisheries. The AWT also liaise with the OLE and may also request the assistance of the USCG vessels and aircraft to help in their surveillance and enforcement activities.

OLE protects marine wildlife and habitat by enforcing domestic laws, e.g. Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679[285]]) and international agreements, e.g. combating Illegal, Unreported, Unregulated (IUU) fishing through the Joint Statement on Enhanced Fisheries Cooperation between the US and Russia.

The OLE in Alaska[286] 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 600.740[287]) that details these "remedies for violations".

The USCG[288] is the primary agency for at-sea fisheries enforcement. The USCG objectives are to prevent encroachment into the US EEZ, ensure compliance with domestic fisheries regulations, ensure compliance with international agreements and high seas fishing regulations. The 17th Coast Guard District[289] 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 pollock fishery is considered to be a lower risk fishery, with the potential for salmon bycatch at certain times of the year being the main issue, however, voluntary compliance, i.e. recognizing a problem, reporting it and making appropriate changes to the fishing practice, helps to minimize the issue (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).

277 https://www.uscg.mil/d17/
278 http://www.nmfs.noaa.gov/ole/
279 http://dps.alaska.gov/AWT/
280 https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf
281 https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/EM211.pdf
282 http://www.nmfs.noaa.gov/ole/
283 http://www.pacificarea.uscg.mil/Our-Organization/District-17/
284 http://dps.alaska.gov/AWT/
285 https://alaskafisheries.noaa.gov/fisheries-679regs
286 http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html
287 https://www.law.cornell.edu/cfr/text/50/600.740
288 https://www.uscg.mil
289 http://www.pacificarea.uscg.mil/Our-Organization/District-17/

The "Donut Hole" agreement is the only area in the Central Bering Sea outside the Alaska EEZ where the pollock resource can be found. This area is subject to an international agreement with other member countries (i.e. Russia, Japan, Korea, etc.) and has been under a fishing moratorium since the mid 1990s. The Central Bering Sea Fisheries Enforcement Act prohibits vessels and nationals of the US from conducting fishing operations in the Central Bering Sea, except where such fishing operations are conducted in accordance with an international fishery agreement to which the is a signatory. The USCG undertakes aerial surveillance patrols and, if necessary, vessel patrols within this area.

The NPFMC Groundfish and Halibut Observer Program[290] (The Observer Program) is an important component of the monitoring of the pollock fishery. The program is the main data gathering program for all biological and fishery data that feed into pollock stock assessment and management. As a result, the vast majority of BSAI pollock fishing trips are observed, and, approximately 20-25% of pollock trips in the GoA have been observed in recent years.

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 Safety[291], through its Division of Alaska Wildlife Troopers[292] is primarily responsibility for enforcing fish and wildlife-related statutes and regulations in Alaska. Some ADFG biologists and other staff have undertaken enforcement training and may participate in enforcement activities[293] and assist the Wildlife Troopers as needed. The AWT attend the BOF and have an important input in the development of state regulations and legislation.

Evidence Basis:
The OLE publishes a national annual report[294] and the Alaska region submits six monthly reports to the NPFMC. As an example, see OLE 2017[295] - 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 pollock 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 webpage[296]), 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 pollock fishery.

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

The NPMC have an Enforcement Committee[297] charged with reviewing proposed FMP amendments, regulatory changes, and other management actions on matters related to enforcement and safety at sea[298]. 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.

290 https://alaskafisheries.noaa.gov/fisheries/observer-program
291 http://dps.alaska.gov
292 http://dps.alaska.gov/AWT/
293 http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main
294 http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf
295 https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C
296 https://www.npfmc.org/committees/enforcement-committee/
297 https://www.npfmc.org/committees/enforcement-committee/
298 https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

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

References:

The US Coast Guard https://www.uscg.mil

NMFS Office of Law Enforcement http://www.nmfs.noaa.gov/ole/

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

Enforcement consideration for NOAA and NPFMC https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_Precepts_1215.pdf

Electronic Monitoring (EM) technologies https://www.npfmc.org/wp-content/PDFdocuments/conservation_issues/EM211.pdf

17th District USCG http://www.pacificarea.uscg.mil/Our-Organization/District-17/

Federal Fisheries Regulations for Fisheries of the EEZ of Alaska [50 CFR 679 https://alaskafisheries.noaa.gov/fisheries-679regs

OLE in Alaska http://www.nmfs.noaa.gov/ole/compliance_assistance/regions/alaska.html

MSA section (50 CFR 600.740[299]) "remedies for violations" https://www.law.cornell.edu/cfr/text/50/600.740

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

The Alaska Department of Public Safety http://dps.alaska.gov

ADFG staff enforcement training http://www.adfg.alaska.gov/index.cfm?adfg=enforcement.main

OLE national annual report http://www.nmfs.noaa.gov/ole/docs/2017/ole_ar_fy16_web.pdf

OLE Alaska region six monthly reports to the NPFMC https://npfmc.legistar.com/LegislationDetail.aspx?ID=3035527&GUID=D73ECF25-A169-47E8-A441-4D391A1CBC9C

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

NPFMC enforcement Committee Terms of Reference https://www.npfmc.org/wp-content/PDFdocuments/membership/Enforcement/Enforcement_TermsReference_0616.pdf

Non-Conformance Number (if relevant):

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

FAO CCRF (1995) 7.6.2 Other 8.1.2, 8.2.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
The local management body does **not** maintain an updated record of all authorization to fish, or vessels are permitted to operate on the	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management body maintain an	Fishing vessels are not allowed to operate on the resource in question without authorization, and the local management body maintain a	Fishing vessels are not allowed to operate on the resource in question without specific authorization.

[299] https://www.law.cornell.edu/cfr/text/50/600.740

resource in question without specific authorization. **Lacking in all parameters.**	**insufficiently** updated record of all authorization to fish. **Lacking in two parameters.**	**moderately** updated record of all authorization to fish. **Lacking in one parameter.**	**Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism or system established to maintain a record of fishing authorizations.
Current Status/Appropriateness/Effectiveness: This mechanism is effective for maintaining updated records of fishing authorizations and ensuring fishing vessels operate with appropriate authorization.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various data.

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

Process:
Every fishing vessel targeting pollock in Alaska is required to have a federal[300] 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[301, 302]

Conclusion:

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

References:

American Fisheries Act https://alaskafisheries.noaa.gov/fisheries/AFA-pollock

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):

300 https://alaskafisheries.noaa.gov/fisheries/AFA-pollock
301 https://alaskafisheries.noaa.gov/permits-licenses
302 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.

FAO CCRF (1995) 8.1.4

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Within a regional framework involving other regional bodies, the local management body is **not** cooperating 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 "Donut Hole" agreement (see Section 1.2 for details) is the only area in the Central Bering Sea outside the Alaska EEZ where the pollock resource can be found (with exception of small quantities of pollock migrating in Cape Navarin. This area is subject to international agreement with other member countries.

The US and Russian Federation maintain the ICC fisheries forum (see section 1.2). The ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. The objectives of the Agreement include cooperation to address illegal fishing on the high seas of the North Pacific and the Bering Sea.

Conclusion:

Evidence Rating:	Low ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑
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)**
The State has **not** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in all parameters.**	The State has **insufficiently** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in two parameters.**	The State has **moderately** implemented internationally agreed measures consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by regional organizations or arrangements. **Lacking in one parameter.**	The state which is members of or participants in sub-regional or regional fisheries management organizations or arrangements implements internationally agreed measures adopted in the framework of such organizations or arrangements and consistent with international law to deter the activities of vessels flying the flag of non-members or non-participants which engage in activities which undermine the effectiveness of conservation and management measures established by such organizations or arrangements. In that respect, Port States also proceed, as necessary, to achieve and to assist other States in achieving the objectives of the FAO CCRF, and

			make known to other States details of regulations and measures they have established for this purpose without discrimination for any vessel of any other State. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if the fishery does not occur outside the State's Exclusive Economic Zone.
Process: There are regulations established against vessels flying the flag of non-members or non-participants country which may engage in activities which undermine the effectiveness of conservation and management measures established by regional bodies.
Current Status/Appropriateness/Effectiveness: These measures are effective in deterring such practices.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include enforcement or other reports.

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

Not applicable for the Alaska pollock fishery

Conclusion:

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

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.

FAO CCRF (1995) 8.2.2

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
No Certificate of Registry has been issued to vessels. **Lacking in all parameters.**	An **insufficient** number of vessels have been issued the Certificate of Registry. **Lacking in two parameters.**	A **moderate** number of vessels have been issued the Certificate of Registry. **Lacking in one parameter.**	The flag State ensures that no fishing vessels entitled to fly their flag fish on the high seas or in waters under the jurisdiction of other States unless such vessels have been issued with a Certificate of Registry and have been authorized to fish by the competent authorities. Such vessels carry on board the Certificate of

			Registry and their authorization to fish. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no foreign vessels fish in the State's EEZ, or if its vessels do not fish in high seas or in another State's EEZ.
Process: There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ.
Current Status/Appropriateness/Effectiveness: These vessels have been issued with a Certificate of Registry and they are required to carry it on board.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

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

Not Applicable - The AFA ensures that vessel owners must demonstrate citizenship and relevant vessel registration documents.

Conclusion:

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

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.

FAO CCRF (1995) 8.2.3

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Vessels have **not** been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in all parameters.**	An **insufficient** number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in two parameters.**	A **moderate** number of vessels have been marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Lacking in one parameter.**	Fishing vessels authorized to fish on the high seas or in waters under the jurisdiction of a State other than the flag State, are marked in accordance with uniform and internationally recognizable vessel marking systems such as the FAO Standard Specifications and Guidelines for Marking and Identification of Fishing Vessels. **Fulfils all parameters.**

Evaluation Parameters Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ. **Process:** There are foreign vessels fishing in State's EEZ. State's EEZ vessels do not fish in high seas or in another State's EEZ. **Current Status/Appropriateness/Effectiveness**: Foreign vessels authorized to fish in the State's EEZ or its vessels fishing in another State's EEZ have been marked accordingly to international guidelines. **Evidence Basis:** Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.			
Evaluation (per parameter)/: General description of evidence in order to score the clause Not applicable for the Alaska pollock fishery			
Conclusion:			
Evidence Rating:	Low ☐	Medium ☐	High ☐
Non-Conformance:	Critical ☐	Major ☐ Minor ☐	None ☐
References:			
Non-Conformance Number (if relevant):			

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

FAO CCRF (1995) 7.7.2/8.2.7

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

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
National laws of adequate severity are **not** in place that provide for effective sanctions. **Lacking in all parameters.**	National laws of adequate severity are in place but **insufficient** to provide for effective sanctions. **Lacking in two parameters.**	National laws of adequate severity are in place but considered **moderate** in providing for effective sanctions. **Lacking in one parameter.**	National laws of adequate severity are in place that provide for effective sanctions. **Fulfils all parameters.**

Evaluation Parameters
Process: The system of national laws is of adequate severity to provide for effective sanctions.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that national laws are of adequate severity to provide for effective sanctions.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

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

Process / Current Status/Appropriateness/Effectiveness / Evidence Basis:

The MSA provides four options for penalizing violations. In ascending order of severity:

1) Issuance of a citation (a type of warning), usually at the scene of the offence (see 15 CFR part 904, subpart E[303]).

[303] https://www.law.cornell.edu/cfr/text/15/part-904/subpart-E

2) Assessment by the Administrator of a civil money penalty.
3) For certain violations, judicial forfeiture action against the vessel and its catch.
4) Criminal prosecution of the owner or operator for some offences. It shall be the policy of NMFS to enforce vigorously and equitably the provisions of the MSA by utilizing that form or combination of authorized remedies best suited in a particular case to this end.

OLE agents and officers can assess civil penalties directly to the violator in the form of a summary settlement or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation who can impose a sanction on the vessels permit or further refer the case to the U.S. Attorney's Office for criminal proceedings[304]. The low proportion of violations encountered during at-sea patrols 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 16.05.723[305], 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 PWS Pollock fishery and ADFG staff consider that sanctions are effective deterrents (pers. comm Forest Bower, ADFG).

Conclusion:

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

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-pollock-bering-sea-and-aleutian-islands/@@assessments

Alaska state law, universal citation 16.05.723[1]
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

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	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	Sanctions applicable in respect of violations and illegal activities are adequate in severity to be effective in securing compliance and discouraging violations

[304] https://fisheries.msc.org/en/fisheries/alaska-pollock-bering-sea-and-aleutian-islands/@@assessments
[305] 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

	event of non-compliance with conservation and management measures. **Lacking in two parameters.**	the event of non-compliance with conservation and management measures. **Lacking in one parameter.**	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.**

Evaluation Parameters
Process: The system of sanctions in place is sufficiently severe to deter violations and illegal activities. The system shall be considered adequate in severity if the potential sanctions include fines, suspension or withdrawal of permission to fish, and confiscation of catch or equipment.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate that sanctions for violations of regulations (e.g., suspension, withdrawal or refusals of fishing permit or of the right to fish) are adequate in severity to secure compliance and discourage violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or reports.

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

Process / current Status / Appropriateness / effectiveness
The parameters in clause 11.1 show that, with the limited violations the sanctions imposed for violations acts a deterrent.

Evidence Basis
NOAA Alaska region has available a "Summary Settlement and Fix-it Schedule"[306] which describes the violation and penalties associated with them. It also includes a sliding scale of penalty for repeat offences, i.e. increasing penalties for, 'first', 'second' and 'third' violations.

Alaska state law, universal citation 16.05.723[307], describes the penalties for violating a BOF regulation. Fines, up to a maximum of $15,000 or imprisonment for not more than 1 year are stipulated, along with forfeiture of any fish, its market value, forfeiture of vessel and any fishing gear. A third misdemeanour conviction within a 10 year period will result in a fine 3 times the value of any fish in possession or a fine of $10,000, whichever is greater. The option of pursuing criminal action is also available to the state.

Conclusion:

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

References:
NOAA Alaska region, Summary Settlement and Fix-it Schedule, http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf

NOAA Office of General Counsel – Penalty Policy and Schedule http://www.gc.noaa.gov/enforce-office3.html

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

Non-Conformance Number (if relevant):

[306] http://www.gc.noaa.gov/documents/gces/AK%20SS%20and%20Fix-it_FINAL.pdf
[307] 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

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. **Lacking in all parameters.**	There are **insufficiently** effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures. **Lacking in two parameters.**	There are **moderately** effective enforcement measures available for fishing vessels entitled to fly their State flag when the vessels have been found by the State to have contravened applicable conservation and management measures. **Lacking in one parameter.**	Flag States take enforcement measures with fishing vessels entitled to fly their flag if the vessels have been found by the State to have contravened applicable conservation and management measures. These enforcement measures will include, where appropriate, making the contravention of such measures an offence under national legislation. **Fulfils all parameters.**

Evaluation Parameters
Not applicable if no foreign vessels fish in the State's EEZ or if its vessels do not fish in high seas or in another State's EEZ.
Process: If applicable, the system of enforcement measures is effective for foreign vessels fishing in the State's EEZ or for its vessels fishing in high seas or in another State's EEZ.
Current Status/Appropriateness/Effectiveness: There is evidence to substantiate enforcement action in these cases i.e., boarding, violations.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various laws, regulations and other data or enforcements reports.

Evaluation (per parameter)/: 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.

Conclusion:

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

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. **Lacking in all parameters.**	There is **insufficient** assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species. **Lacking in two parameters.**	There is **moderate** assessment of the impacts of environmental factors on target stocks and associated or dependent species in the same ecosystems, and the relationships among these species. **Lacking in one parameter.**	The State assesses the impacts of environmental factors on target stocks and species belonging to the same ecosystem or associated with or dependent upon the target stocks, and the relationship among the populations in the ecosystem. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for the assessment and monitoring of environmental factors (e.g. climatic, oceanographic) on target stocks and associated species in the same ecosystem, and to assess the relationships between species in the ecosystem.
Current Status/Appropriateness/Effectiveness: There is evidence that assessments have been conducted to determine the impacts of environmental factors on the target stock and on associated or dependent species (to the stock) in the same ecosystems, and on the relationships among these species. The results of these studies are in sufficient detail to allow informed management of the fishery.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports**.**

Evaluation:
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 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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	There is **insufficient** assessment and corrections, where appropriate, of adverse environmental impacts on the resources from human activities.	There is **moderate** assessment and corrections where appropriate, of adverse environmental impacts on the resources from human activities.	Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected. All potential impacts

evaluation parameters are not considered. **Lacking in all parameters.**	Many of the potential impacts listed in the evaluation parameters are not considered. **Lacking in two parameters.**	Some of the potential impacts listed in the evaluation parameters are not considered. **Lacking in one parameter.**	listed in the evaluation parameters are considered. **Fulfils all parameters**.

Evaluation Parameters
Process: There is a process that allows for the assessment of environmental impacts and their minimization or correction.
Current Status/Appropriateness/Effectiveness: There is evidence of appropriate assessments made to elucidate the impacts environmental impacts on the resources from human activities. Human impacts include both fishing and non-fishing activities. Examples may include overfishing of the target stock, significant bycatch of associated species, gear-habitat interactions, and where relevant, mining, dredging, pollution, introduction of exotic species, and conversion of important aquatic habitats.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation:
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.

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.

The PSEIS and other EIS's required under NEPA would necessarily consider all potential impacts on the resources.

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.

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.

Evidence Basis: The PSEIS, review documents and other EIS of non-fishing activities are readily available, notably through the NMFS website.

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

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, catches of chinook salmon). 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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)**
There is **no** addressing of significant impacts employing an immediate management response or a further analysis of the identified risk. **Lacking in all parameters.**	Impacts that are likely to have serious consequences are **insufficiently** addressed employing an immediate management response or a further analysis of the identified risk. **Lacking in two parameters.**	Impacts that are likely to have serious consequences are **moderately** addressed employing an immediate management response or a further analysis of the identified risk. **Lacking in one parameter.**	Impacts that are likely to have serious consequences are addressed. This may take the form of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a process that allows for impacts that are likely to have serious consequences to be addressed.
Current Status/Appropriateness/Effectiveness: If there are impacts likely to have serious consequences, there is evidence available to support the use of an immediate management response or a further analysis of the identified risk. In this context, full recognition should be given to the special circumstances and requirements in developing countries and countries in transition, including financial and technical assistance, technology transfer, training and scientific cooperation.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation:
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, 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:

6. Conservative harvest levels are set for single and multi-species fisheries – these are demonstrable for each target species and group affected.
7. 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
8. 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)
9. 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.
10. 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 NMFS 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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)**
There is **no** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in all parameters.**	There is **insufficient** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in two parameters.**	There is **moderate** application of appropriate measures to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Lacking in one parameter.**	Appropriate measures are applied to minimize catch, waste and discards of non-target species (both fish and non-fish species) and impacts on associated, dependent or endangered species. **Fulfils all parameters.**

Evaluation Parameters
Process: There is a mechanism by which management measures are developed to minimize the catch, waste and discarding of non-target species and the impact of the fishery on associated, dependent and ETP species. This system shall include the development of specific management objectives.
Current Status/Appropriateness/Effectiveness: There are measures in place to minimize catch, waste, and discards of non-target species (both fish and non-fish species). These measures are considered effective at achieving the specific management objectives described in the process parameter.
There are measures in place to minimize impacts on associated, dependent, or endangered species. These measures are considered effective at achieving the specific management objectives described in the process parameter.
Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include various stock and ecosystems assessment reports.

Evaluation:
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 pollock fisheries) red king crab, tanner crab and herring in the BSAI. As an example, the final rule for Amendment 110 to the FMP for groundfish of the BSAI management area was published in June 2016. The rule will improve the management of Chinook and chum salmon bycatch in the BSAI pollock fishery by creating a comprehensive salmon bycatch avoidance program. In addition to revising seasonal allocations of pollock, the Chinook salmon performance standard and PSC limit will be reduced in years of low Chinook salmon abundance in western Alaska. As hard bycatch limits (as implemented for chinook salmon and halibut) can cause closure of a fishery, industry is proactive in seeking means of limiting catches. The approaches taken in the BSAI include in-season monitoring and reporting of catches and closures of areas of high bycatch (the SEASTATE monitoring programme), permanent closure of areas of high salmon bycatch, rolling hot-spot closures of areas of highest bycatch rates and gear modifications to limit catches (such as trawl gear modification in the AFA fleet to allow escapement of salmon without loss of groundfish). These mechanisms are seen as being adaptive and effective.

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 ETP 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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

ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in all parameters.**	objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in two parameters.**	objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in one parameter.**	endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process in place that allows for the creation of management objectives that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. A note on data collections. The adequacy of data relates primarily to the quantity and type of data collected (including sampling coverage) and depends crucially on the nature of the systems being monitored and purposes to which the data are being put. Some analysis of the precision resulting from sampling coverage would normally be part of an assessment of adequacy and reliability. The currency of data is important inter alia because its capacity for supporting reliable assessment of current status and trends declines as it gets older. The requirements for data collection are focussed on the effects of the unit of certification on endangered species.

Current Status/Appropriateness/Effectiveness: There is evidence of effective management objectives in place in the fishery under assessment (e.g. in a fishery management plan) that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation:

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 tailed 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: revised observer sampling protocols implemented in 2011 improved estimates of the stock of origin (from both CWT and genetic stock assignment) of the Chinook bycatch from the pollock fishery.

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

Objectives set out in the BSAI and GoA FMPs are:

- Continue to cooperate with 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.

BSAI pollock fishery: Marine mammals are rarely taken incidentally in the BSAI pollock 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). Objectives and management responses have also been implemented in relation to the potential effects of the fishery on food availability. 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. 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 haul outs. Effects on mammals are specifically considered when setting pollock TACs and seasonal allowances.

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. Trawl fisheries for pollock and other species account for a small fraction of seabird bycatch. AFSC (S Fitzgerald pers. comm.) report very low bycatch of seabirds, with no observed takes of short- tailed albatross. AFSC have been researching potential "cryptic" mortality, in which bird bycatch can happen on trawl vessels where the birds are not available to standard sampling. Overall, however, there are considered to be no marine bird conservation issue for pelagic trawl vessels, especially in the pollock fleet.

The estimates of individuals from endangered populations of salmon in the pollock fishery come from coded-wire tag recoveries from salmon bycatch. These data indicate that between 1984 and 2012 few wild Chinook from the lower Columbia or upper Willamette rivers were taken by the pollock fishery (Ford 2011). Most (97%) of the CWT recoveries are from hatchery salmon. Given the small number of Chinook estimated to have been taken in the pollock fishery, the BSAI pollock fishery is highly unlikely to pose a threat to ESA-listed salmon populations in the Pacific Northwest.

GoA Pollock fishery: As with the BSAI fishery, direct interactions of pollock gear with marine mammals is very rare. 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.

As with the BSAI, there are considered to be no marine bird conservation issue for pelagic trawl vessels, especially in the pollock fleet. 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.

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 supported by well-designed data-gathering programmes and analyses; these are widely available through NMFS and NPFMC websites. These are, in relation to the complexity of factors which may affect species dynamics, comprehensive and rigorous in their analysis.

Conclusion:

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

References: Muto et al 2015; NMFS 2010; NMFS 2012; NMFS 2014; NPFMC 2016a; NPFMC 2017; USFWS 2015; Ford 2011; https://www.afsc.noaa.gov/ABL/Genetics/gsi_default.php

Non-Conformance Number (if relevant):

12.6 Non target catches, including discards, of stocks other than the "stock under consideration" shall be monitored and shall not threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible; if such impacts arise, effective remedial action shall be taken.

FAO Eco (2009) 31.1
FAO Eco (2011) 41.1

Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
Non-target catches, including discards, of stocks other than the "stock under consideration" are **not** monitored and may threaten these non-target stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. If such impacts arise,	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.	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.	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

effective remedial action are **not** taken. **Lacking in all parameters.**	If such impacts arise, effective remedial action are **insufficiently** taken. **Lacking in two parameters.**	If such impacts arise, effective remedial action are **moderately** taken. **Lacking in one parameter.**	remedial action are taken. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a system to monitor non-target catches and discards of stocks other than the stock under consideration, and to determine the likelihood that these catches and discards represent a significant risk to the affected species. The assessment of risks shall support the achievement of appropriate management objectives for bycatch species.

Current Status/Appropriateness/Effectiveness: If catches endanger these stocks with serious risk of extinction, recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible serious risk of extinction, effective remedial action is taken by the management organization. Examples of irreversible or very slowly reversible effects on bycatch species include excessive depletion of very long-lived organisms. To mitigate effects that are likely to be irreversible or very slowly reversible requires those effects to be made less severe such that they are no longer likely to be irreversible or very slowly reversible. Examples of management measures may include incidental take allowances, bycatch caps, prohibited retention, safe release practices, or use of bycatch reduction devices or practices. Remedial action shall be considered effective if it reduces the impact of the fishery on non-target species to the point where there is no longer a risk of extinction.

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

Evaluation:

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-tailed 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 non-Chinook salmon, halibut and red king crab and certain species of 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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. **Lacking in all parameters.**	There is **insufficient** consideration of the role of the "stock under consideration" in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators. **Lacking in two parameters.**	There is **moderate** consideration of the role of the "stock under consideration" in the food web, especially if it is a key prey species in the ecosystem, with objectives and measures to avoid severe adverse impacts on dependent predators. **Lacking in one parameter.**	The role of the "stock under consideration" in the food web is considered, and for a key prey species in the ecosystem, with objectives and management measures are in place to avoid severe adverse impacts on dependent predators. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place by which the role of the stock under consideration in the food web is assessed and monitored, and its relative importance as a prey species is determined. If the species is considered by the relevant scientific authority to be an important prey species, there shall be specific management objectives relating to minimizing the impacts of the fishery on dependent predators. The FAO Guidelines require that all sources of fishing mortality on the stock under consideration are taken into account (whether or not it is a prey species) in assessing the state of the stock under consideration, including discards, unobserved mortality, incidental mortality, unreported catches and catches in other fisheries.

Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the management objectives described in the process parameter, and there is evidence to demonstrate that they are successful to this end. If the species under assessment is not considered to be a key prey species, then this parameter shall be considered fulfilled.

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

Evaluation:

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.

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 pollock, cod 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 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 protected species (for example 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.

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.

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.

Conclusion:

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

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	**Medium Confidence Rating**	**Medium Confidence Rating**	**High Confidence Rating**

(Critical NC)	(Major NC)	(Minor NC)	(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). **Lacking in all parameters.**	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). **Lacking in two parameters.**	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). **Lacking in one parameter.**	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.**

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

References:

96th US Congress. 1980. An Act to implement the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973, and for other purposes. 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 though a systematic, objective and well-designed process, and is not just hearsay). When identifying highly vulnerable habitats, their value to ETP species shall be considered, with habitats essential to ETP species being categorized accordingly.

Current Status/Appropriateness/Effectiveness: There are management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

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

Evaluation

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 and completed in 2017.

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 ½ 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).

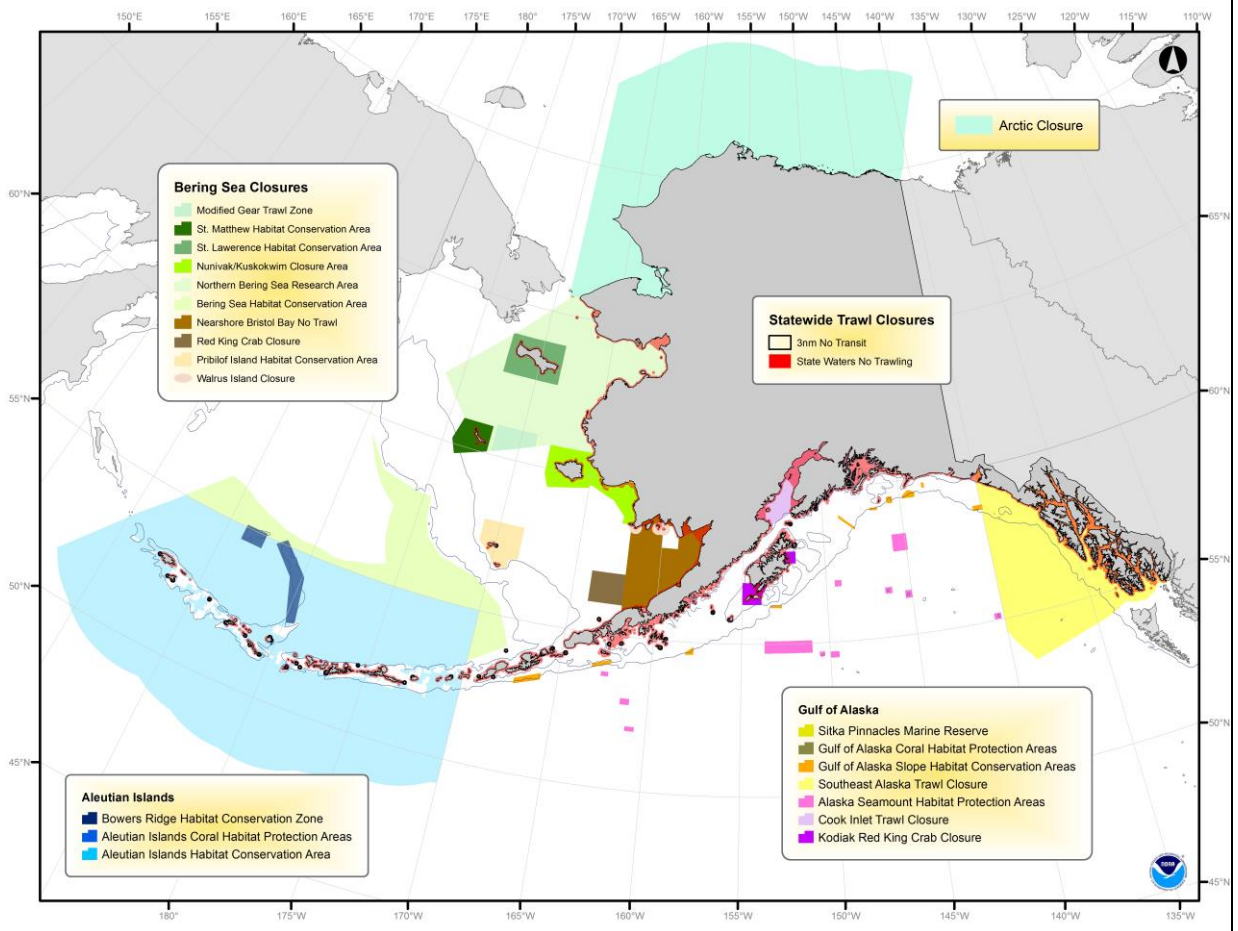
Process: There is a well-defined process in place to model the extent of EFH for each major species, including pollock, and to evaluate, according to set criteria, the effects of fishing. Where such effects may be appreciable, a process to evaluate and mitigate is in place within the NPFMC. An alternative process is in place to identify priority HAPC and to evaluate and protect these. These processes specifically include the effects of pollock-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 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 pollock in the EBS, female spawning biomass was estimated to be above Bmsy and so significantly above Minimum Stock Size Threshold (MSST). The CEA is defined as the predicted 50% quantile threshold of suitable habitat or summer abundance for each species. Effects on pollock CEA were of generally low impact, with a few small areas of higher habitat reduction (>25%) in the middle domain of the EBS shelf. Overall fishing impacts in the pollock core EFH area are very low. The average percent reduction for the EBS is 2.6%, and the maximum value was 3.6% in November of 2008. All these values are much below the 10% habitat impact that was established as the trigger for further analysis and so no further analysis was deemed necessary.

For pollock in the GoA, female spawning biomass is above B35% (for Tier 3 stocks, which is considered the proxy MSY level). Since the MSST is considered to be one half of the MSY level, GOA pollock are also determined to be above the MSST. In relation to effects on CEA, the overall picture is again one of low impact on habitat, albeit with small areas of higher habitat reduction (>25%) distributed throughout the GOA shelf. Overall fishing impacts in the pollock core EFH area are very low. The average percent reduction for the Gulf of Alaska as a whole is 1.7%, and the average for area 630, where trawl impacts are highest, is 3%, and did not exceed 4.1% in any month. All these values are much below the 10% habitat impact that was established as the trigger for further analysis. No mitigation measures Are therefore required, but areas of further research are identified.

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

References: Ianelli et al 2016; Dorn 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)**
Research is **not** promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in all parameters.**	**Insufficient** research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in two parameters.**	**Moderate** levels of research are promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities. **Lacking in one parameter.**	Research is promoted on the environmental and social impacts of fishing gear and, in particular, on the impact of such gear on biodiversity and coastal fishing communities. **Fulfils all parameters.**

Evaluation Parameters

Process: Research is promoted on the environmental and social impacts of fishing gear and its impacts on biodiversity and coastal fishing communities, as applicable to the fishery.

Current Status/Appropriateness/Effectiveness: There is evidence for this research, and is it considered appropriate for overall fisheries management purposes.

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

Evaluation

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

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	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	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.	irreversible or very slowly reversible). **Lacking in two parameters.**	irreversible or very slowly reversible). **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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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	There are **insufficiently** effective outcome indicators that seek to ensure that	There are **moderately** effective outcome indicators that seek to ensure that endangered	There are effective outcome indicators that seek to ensure that endangered species are protected from adverse

impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in all parameters.**	endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in two parameters.**	species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Lacking in one parameter.**	impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process in place that allows for the creation of effective outcome indicators that seek to ensure that endangered species are protected from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible.

Current Status/Appropriateness/Effectiveness: There is evidence for established outcome indicators (e.g. in a fishery management plan or other regulation) that seek to ensure that endangered species are protected (through state or federal regulations) from adverse impacts resulting from interactions with the unit of certification and any associated culture or enhancement activity, including recruitment overfishing or other impacts that are likely to be irreversible or very slowly reversible. Management objectives shall be achieved accordingly.

Evidence Basis: Availability, quality, and adequacy of the evidence. Examples may include fishery management plans, stock and ecosystems assessment reports.

Evaluation

The basis of protection of endangered species is the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA). The endangered, threatened, and protected 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 ≤ 1% of the marine mammal's Potential Biological Removal (PBR) level and total fishery-related mortality < 10% of PBR. Any fishery in Category III is considered to have achieved the target levels of mortality and serious injury. Category II fisheries have a level of mortality and serious injury that > 1% but is < 50% of the stock's PBR level, if total fishery related mortality is ≥ 10% of the PBR. Category I fisheries have frequent mortality and serious injury of marine mammals resulting in annual mortality ≥ 50% of PRB. No Alaska groundfish fisheries, including for pollock are included in Category I. All other 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 Steller sea lions and northern fur seals; short tailed 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 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).
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. Trawl fisheries for pollock and other species account for a small fraction of seabird bycatch. AFSC (S Fitzgerald pers. comm.) report very low bycatch of seabirds, with no observed takes of short- tailed albatross. AFSC have been researching potential "cryptic" mortality, in which bird bycatch can happen on trawl vessels where the birds are not available to standard sampling. Overall, however, there are considered to be no marine bird conservation issue for pelagic trawl vessels, especially in the pollock fleet.
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. 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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

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)
There are **no** outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in all parameters.**	There are **insufficiently** effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in two parameters.**	There are **moderately** effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Lacking in one parameter.**	There are effective outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a mechanism in place that allows the establishment of outcome indicator(s) consistent with achieving management objectives that seek to avoid severe adverse impacts on dependent predators resulting from the unit of certification fishing on a stock under consideration that is a key prey species. Mortality in Alaska is usually accounted for all removals of given species. The State and federal fish accounting systems operate in depth and make an explicit effort to document all removals, to confirm with regulations in force. The assessors shall ensure that all removals are accounted in the system (fish ticket, eLanding) for stock assessment and management purposes.

Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicators and management measures in place which have been developed to achieve the objectives described in the process parameter, and have been successful in doing so.

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

Evaluation

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 mammals predators of 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 mammals 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 ☐	Medium ☐		High ☑
Non-Conformance:	Critical ☐	Major ☐	Minor ☐	None ☑

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.

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Low Confidence Rating (Critical NC)	**Medium Confidence Rating (Major NC)**	**Medium Confidence Rating (Minor NC)**	**High Confidence Rating (Full Conformance)**
There are **no** outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the	There are **insufficiently** effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly	There are **moderately** effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very	There are effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the

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.**	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.**	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.**	stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function. **Fulfils all parameters.**

Evaluation Parameters

Process: There is a process to allow for drafting effective outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. There is also a process to allow any modifications to the habitat for enhancing the stock under consideration and serious or irreversible harm to the natural ecosystem's structure, processes and function to be reversed.

Current Status/Appropriateness/Effectiveness: There is evidence for outcome indicator(s) consistent with achieving management objectives that seek to minimize adverse impacts of the unit of certification, including any enhancement activities, on the structure, processes and function of aquatic ecosystems that are likely to be irreversible or very slowly reversible. Any modifications to the habitat for enhancing the stock under consideration are reversible and cause serious or irreversible harm to the natural ecosystem's structure, processes and function.

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

Evaluation

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

References: Aydin 2017; Holsman et al 2016; NMFS 2010; NPFMC 2016a; NMFS 2017b; Zador 2016a; Zador 2016b; Zador 2016c

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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

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes**	**Assessment Team Response**
Justification: 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. 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. I have also made some "General Comments". Of these, my only real concern is associated with the reported catch composition. Many of the non-target species caught in the fishery are demersal, which is unusual for a pelagic trawl fishery, and requires either an explanation or closer examination.		Addressed clause-by-clause as necessary. Addressed in General Comments, as well as in Clause 8.8

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?	**NA**	**Assessment Team Response**
Justification: No non-conformances have been raised.		

If applicable:

Do you think the client action plan is sufficient to close the non-conformances raised?	**Yes/No**	**Assessment Team Response**
Justification: Not applicable – no non-conformances have been raised.		

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	Judging from the narrative section of the report (section 3.6.5), the scoring is justified. 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." The rationale includes irrelevant information about trawl and acoustic surveys and not relevant information about compliance levels.	The 'Evaluation Parameters' associated with 'Appropriateness / Effectiveness were accidentally omitted. This has been rectified. The Evaluation Parameter associated with 'Current Status' refers to the output of the management organisations and includes, as examples, scientific research, stock assesment and ecosystem assessments. Hence, mention of trawl and acoustic surveys was included. The Current Status section has been amedned to more clearly articulate the situation.
1.2	Yes	Yes	NA	The evidence presented in the report indicates that the Alaskan pollock stock comprises several sub-units, and that there are appropriate stock assessments and	

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
				management measures in place for each sub-unit.	
1.2.1	Yes	Yes	NA	The informaiton presented demonstrates that the management system takes account of previously agreed managmeent measures.	
1.3	Yes	Yes	NA	Information is presented about international collaboration to manage this stock. The only significant fishery removals occur in US waters, with a moratorium in international waters and a very small fishery in Russian waters. The scoring is therefore appropriate.	
1.3.1	No	No	NA	The evidence basis does not address the requirements of this clause. Instead, the evidence basis concentrates on the US acoustic surveys in Russian waters. Whilst these are evidence of collaborative	The 'Process' and 'Evidence Basis' evaluation parameters have been amended. Additional information showing proof of agreements, records of meetings and decisions, and the contribution of collaborative work 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
				management, the survey does not demonstrate that management measuresa are compatible for the stock concerned. This information is presented elsewhere in the report and should be presented here to justify the score awarded (which would be appropriate when such changes are made).	relation to stock assesments have been included. The maintenance of the EBS stock well within sustainable levels demonstates that management measures are compatible for the pollock stock.
1.4	Yes	Yes	NA	The scoring is justified. It would be improved by reference to the US-Russia agreement and also the process for transposing a proporiton of the overall TAC into the GOA.	
1.4.1	Yes	Yes	NA	The scoring is justified. It would be strengthened by reference to the US-Russia agreement.	
1.5	No	Yes	NA	For this scoring rationale it would be	The 'Process' and 'Evidence Basis'

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 to mention the US survey in Russian waters that was erroneously used for 1.3.1 above.	evaluation parameters for 1.3.1 have been amended.
1.6	Yes	No	NA	The "High" score is not supported by the evidence presented. Annual costs for groundfish fishery management are cited at around US$60M pa in the GOA and BSAI, and around US$70M pa for all fisheries in the ADFG. It is stated that the cost of managing the pollock fishery is not known, nor is the income from levies on the fisign industry stated in the report. No information is presented on the costs associated with international collaboration for stock management, nor how these costs are met. Further information is required to fully justify this scoring level.	The text has been revised and additional information has been added to strengthen the rational for justifying a high confidence rating.

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
1.6.1	Yes	Yes	NA	The scoring is justified.	
1.7	Yes	Yes	NA	The scoring is justified.	
1.8	Yes	Yes	Yes	The scoring is justified.	
1.9	NA	NA	NA	NA	
2.1	Yes	Yes	NA	The scoring is justified.	
2.1.1	Yes	Yes	NA	The scoring is justified.	
2.2	No	No	NA	The scoring jusification focuses on how stakeholders are informed after fishery management decisions are taken, rather than how representatives of the fisheries sector are "*consulted about other activities related to to coastal area management planning and development."* This clause is intended to test whether there is a joined-up management	The text has been amended to ensure that it covers coastal area managemnt and planning.

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
				system in place for coastal areas which ensures that the sensitive nature of fish stocks and the socio-economic interests of fisheries stakeholders are taken into account in development and managment decisions. The information presented sheds no light on this issue; the scoring comments need to be revised.	
2.3	No	No	NA	The information presented appears to be better aligned with one of the "Medium" confidence rating than "High", because evidence is presented that gear conflict issues do arise and that they are resolved by fishermen rather than through administrative procedures.	On reviewing the text it is considered that the existing adminitrative proceses afforded by the fisheries agencies is highly consultative and achieves extensive participation which helps minimise conflict or contributes to it's resolution. Previous reference to fishermen resolving their own gear conflict issues, referred to localised instances where issues were considered to be minor.
2.4	No	No	NA	It would be appropriate to transpose most of	The text has been amended to ensure that it more accurately

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
				the scoring rationale from clause 2.2 into this clause to strengthen the scoring. If this is done, the score would seem appropriate.	covers the clause and evaluation parameters.
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	No	No	NA	The process evaluation parameters ask for evidence that "there are management measures in place to ensure the economic conditions under which the fishery operates promote responsible fisheries." The evaluation does not explain how the	It does not seem unreasonable to highlight that favourable environmental conditions have contributed to the economic stability of the pollock fishery. That said, the text has been amended to take account of the specific point that management measures are in place to ensure the economic

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
				management measures in place achieve this (and also raise the possibility that the good economic status of the fishery is due to environmental conditions as much as management action). Information elsewhere in the report indicates that by managing the fishery to attain the appropriate target reference point, the management measures both protect the target stock and maintain an abundance of fish that makes fishing economically viable.	conditions help promote responsible fisheries.
3.2.3	Yes	Yes	NA	The scoring is justified.	
3.2.4	Yes	Yes	NA	The scoring is justified.	
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.	

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
4.1.1	Yes	Yes	NA	The scoring is justified.	
4.1.2	Yes	Yes	NA	The scoring is justified.	
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.	
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 shold consider the Alaskan state policy commitments to increase Alaska Native Consultation (see clause 3.1).	Text has been revised as suggested.
4.7	No	No	NA	This clause is stated to be "Not Applicable". I do not agree. Elsewhere, the report refers to the surveys that US vessels conduct in	Text modified to reflect US-Russia cooperation

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
				Russian waters (see, inter alia, Section 3.1 & Clause s1.2 & 8.12). This should be taken into account, and this clause should be scored.	
4.8	No	No	NA	This clause is stated to be "Not Applicable". I do not agree. The approach adopted here is at odds with that presented for Clause 5.3 which states that there is international cooperation to encourage research.	Assuming that the Donut Hole make this clause applicable. We have added some text on the Convention covering the Donut Hole, as well as some on the USA involvement in PISCES.
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.	Additional text included
4.10	NA	NA	NA	Again, some justification of why this clause is not applicable would seem appropriate.	Additional text included

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
4.11	NA	NA	NA	Again, some justification of why this clause is not applicable would seem appropriate.	Additional text included
5.1	Yes	Yes	NA	The scoring is justified.	
5.1.1	Yes	Yes	NA	The scoring is justified.	
5.1.2	Yes	Yes	NA	The scoring is justified.	
5.2	No	No	NA	The focus of the scoring comments is too narrow. No consideration is given to the effects of climate or environment change on fish stocks and aquatic ecosystems, despite information being presented elsewhere in the report about this (section 3.9).	A paragraph drawn from Section 3.9 has been added to the Evidence, which focuses on the climatic and ecosystem modelling being done.
5.3	Yes	Yes	NA	The scoring is appropriate.	
5.4	Yes	Yes	NA	The scoring is appropriate.	
5.5	Yes	Yes	NA	The scoring is appropriate.	
6.1	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
6.2	Yes	Yes	NA	The scoring is appropriate.	
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	Yes	Yes	NA	The scoring is appropriate.	
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.	

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
8.4	No	No	NA	This clause seems to test whether there are appropriate input controls (fleet capacity) in place rather than output controls (TAC). The rationale presented shows that fleet capacity is measured and that (in terms of number of vessels) it has recently declined. No evidence is presented of input controls to limit fleet capacity (such as the Restricted Access Management Program referred to elsewhere in the report). The rationale should be updated to provide evidence that "mechanisms are established where excess capacity exists, to reduce capacity to levels commensurate with sustainable use of the resource."	Data shows relative stability in fleet size following decline after AFA. Some additional text highlighting the RAM Program has been added.
8.5	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
8.6	Yes	Yes	NA	The scoring is appropriate.	
8.7	No	No	NA	The scoring rationale only considers non-target species. It would seem to be appropriate to mention the international response to the pollock stock in the "Donut Hole" which is subject to a moratorium.	Agreed – good point. We have added text on the Convention and moratorium.
8.8	No	No	NA	The catch composition from the fishery (Tables 3.1.1 & 3.1.2) is very unusual for a truly pelagic trawl fishery (see my "General comments" below). There is a consistent and significant catch of demersal species (flatfish, groundfish and demersal elasmobranchs) in the fishery. This requires some explanation – it can only be a result of the gear making contact with the seabed or perhaps	We have addressed this part in the General comments section. There are several places in the report where it is noted that although pelagic trawls are used, they do contact the seabed. The bycatch of groundfish has been noted, particularly with the addition of several sentences in clause 8.8. It is also acknowledged in the existing text of Clause 8.5.In any case, bycatches are very low compared to the volume of pollock caught, and are closely monitored by

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
				some change in the behaviour of the species concerned that results in them being present in the water column.	observers. There does not appear to be any adverse effects of these bycatches on the stocks of the by-catch species, based on the 2016 SAFE documents for these species.
8.9	Yes	Yes	NA	The scoring is appropriate.	
8.10	Yes	Yes	NA	The scoring is appropriate.	
8.11	Yes	Yes	NA	The scoring is appropriate.	
8.12	Yes	Yes	NA	The scoring is appropriate.	
8.13	Yes	Yes	NA	The scoring is appropriate.	
8.14	Yes	Yes	NA	The scoring is appropriate.	
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*".	Agreed

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
				Perhaps "*comprehensive*" might be a better description.	
10.1	Yes	Yes	NA	The scoring is appropriate.	
10.2	Yes	Yes	NA	The scoring is appropriate.	
10.3	Yes	Yes	NA	The scoring is appropriate.	
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	No	No	NA	The scoring rationale addressed the first part of the high confidence rating, but not the second. Evidence should be presented that "Sanctions are in force that affects authorization to fish and/or to serve as masters or officers of a fishing vessel,	Evidence of sanctions at the federal and state level have been included and referenced.

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
				in the event of non-compliance with conservation and management measures."	
11.3	No	No	NA	It is not clear whether vessels operating in this fishery may, when not fishing for pollock, fish in other States' EEZs or in High Seas fisheries. Such justification is required.	This has been made explicit in the scoring rationale.
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.	

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
12.8	Yes	Yes	NA	The scoring is appropriate.	
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 . cluase, the full text of each acronym is given when it is first used.

Non-target species – I find the catch composition described in Tables 3.1.1 and 3.1.2 very unusual for pelagic fishing gear. There is a consistent and significant catch of demersal species (various flatfish species, and demersal elasmobranchs). Such species are not usually caught in truly pelagic trawl gear.

This is an important issue that requires further examination and explanation. It can only be a consequence of either contact between the "pelagic" fishing gear and the seabed; or alternatively these species perhaps abandoning their demersal habitat to feed in the water column for reasons that are not elaborated in the report.

If the catch of demersal species results from contact between the fishing gear and the seabed, then it is likely that the design and construction of the fishing gear would differ from truly pelagic trawls, so that the gear can withstand such interactions. The design and construction of the footrope, trawl doors and belly of the gear would each provide some indication of whether the gear has been designed with ground contact in mind. Further to this, if the fishing gear routinely makes contact with the seabed, then the text relating to habitat impacts will require revision.

If the catch of demersal species results from their behaviour in this region, it would be useful to explain this.

Both of these issues require consideration in the narrative text and scoring of the fishery.

Assessment team response:

For Table 3.1.1, the listed BSAI by-catches in total are less than 2% of the pollock catches in 2014-15. This is a very clean fishery in terms of bycatch. The BSAI fishery is entirely by pelagic trawls, which are fished close to and sometimes in contact with the seabed. A portion of the catches of certain species in Table 3.1.1, such as cod, ocean perch, and squid, would likely be caught off-bottom. The percentage of non-pollock catch in the GOA fishery (Table 3.1.2), is slightly higher due to the presence of some non-pelagic trawls which are allowed in the GOA fishery. Some additional text has been added in Clause 8.8 to address the by-catch concern.

Western Alaska Community Development Quota – although this is not related to the pollock fishery, I do not understand how or why "*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 pollock TAC.*" (Section 3.1c of the report). This approach seems to fly in the face of all principles of sustainable fishery management for the species concerned: if I understand this text correctly, it results in the catch limit (TAC) for non-pollock species being based on the abundance of pollock. This seems rather like comparign apples with pears.

I do not think that this particular issue affects the outcome of the assessment, but flag it up as an issue of concern.

Assessment team response:

We agree the text could be more clear. The CDQ allocation for pollock is 10% of the BSAI pollock TAC. The other species are allocated separately and are not related to this 10%. Text is modified to reflect this in Section 3.1c and Clause 8.1.2.

Peer Reviewer B Comments

Peer Reviewer Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes/No**	**Assessment Team Response**
Justification: **Yes**		

Do you think the non - conformance(s) raised are appropriate to achieve the high level of confidence, assigned to a given supporting clause, within the specified timeframe?	**Yes/No**	**Assessment Team Response**
Justification: **N/A**		

If applicable:

Do you think the client action plan is sufficient to close the non-conformances raised?	**Yes/No**	**Assessment Team Response**
Justification: ***N/A***		

Table 4 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	Yes	Yes	NA		
1.2.1	Yes	Yes	NA		
1.3	Yes	Yes	NA		
1.3.1	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
1.4	Yes	Yes	NA		
1.4.1	Yes	Yes	NA		
1.5	Yes	Yes	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	Yes	Yes	NA		
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		
4.1	Yes	No	NA	The documentation available does not provide any evidence of collection of relevant information of traditional, fisher or community knowledge. 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.	We consider the fishery data collected to meet all the criteria specified in this clause (timing, level of aggregation, relevant management organisations, etc.). The clause states that the data can contain relevant information from other sources. Data collected from the fishing fleets such as CPUE, location of catches, etc. is included in the SAFE reports for the pollock assessments, and a sentence has been added to reflect this.

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
4.1.1	Yes	Yes	NA		
4.1.2	Yes	Yes	NA		
4.2	Yes	Yes	NA		
4.3	Yes	Yes	NA		
4.4	Yes	Yes	NA		
4.5	Yes	Yes	NA		
4.6	Yes	Yes	NA		
4.7	NA	NA	NA		
4.8	NA	NA	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	Yes	Yes	NA		
5.2	Yes	Yes	NA		
5.3	Yes	Yes	NA		
5.4	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
5.5	Yes	Yes	NA		
6.1	Yes	No	NA	The documentation stated that 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%. However the team should demostrate that B35% is an appropriate proxy for BMSY and provide relevant reference.	B35% as a proxy for Bmsy is defined in the NPFMC groundfish FMPs. This proxy is the generally accepted level, and has been examined in papers such as Punt et al. 2014. I have added some text and this reference to Section 6.1.
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		

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	Yes	Yes	NA		
8.1.1	Yes	Yes	NA		
8.1.2	Yes	Yes	NA		
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	Yes	Yes	NA		
8.12	Yes	Yes	NA		
8.13	Yes	Yes	NA		
8.14	NA	NA	NA		
9.1	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
9.2	Yes	Yes	NA		
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	Yes	Yes	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		
12.6	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
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		

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