FAO-BASED RESPONSIBLE FISHERIES MANAGEMENT CERTIFICATION
FULL ASSESSMENT AND CERTIFICATION REPORT

For The

US Alaska Pollock Commercial Fishery

(200 mile EEZ)

Applicant Group

Alaska Seafood Marketing Institute (ASMI)

September 2011

Global Trust Certification Ltd.

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I. Summary and Recommendations

Summary

The Alaska Seafood Marketing Institute (ASMI), on behalf of the Alaska pollock commercial fishery, has requested it's assessment to the requirements of the United Nations Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fisheries (CCRF, 1995) based Responsible Fisheries Management (RFM) Certification Program. The FAO CCRF was initiated in 1991 by the FAO Committee on Fisheries and unanimously adopted on 31 October 1995 by the over 170 member Governments of the FAO Conference.

The ASMI application was made in April 2010. After Validation Assessment was completed in April 2011, a full Assessment Team was formed to undertake the assessment and final certification determination was given on the 6th of December 2011.

Alaska pollock (*Theragra chalcogramma*) is the species of focus in this Assessment and Certification Report. The Alaska pollock commercial fishery employs pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and is subjected to 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.

The FAO CCRF was presented to an ISO 65/EN45011 accredited Certification Body, Global Trust Certification, to be used as the Standard for the assessment of Alaska Fisheries. The conformance reference points from the published FAO CCRF (now referred to as Standard) were converted into the audit checklist criteria [FAO-Based RFM Conformance Criteria (Version 1.2, Sept 2011)] by the ISO 65/EN45011 Certification Body to ensure audit ability and feasibility for accreditation.

The audit checklist criteria were cross-referenced back to the FAO CCRF Clauses. A further FAO document, the Guidelines on Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries (FAO 2005) was used to help contextualize and add clarity to the audit criteria. The FAO CCRF and the FAO-Based RFM Conformance Criteria were submitted to a National Accreditation Board of the International Accreditation Forum for further cross reference and ISO 65/EN45011 accreditation validity.

This Full Assessment Report should be read in conjunction with the Certification Summary attached in Appendix 3 of this document.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification using the FAO-Based Conformance Criteria (Version 1.2, September 2011). Whilst the FAO CCRF contains Articles with differing focuses, the "remit" of the FAO-Based Conformance Criteria focuses on responsible fisheries management, including enhancement practices (but excluding full cycle aquaculture), up to the point of landing, with the main objective being the biological sustainability of the "stock under consideration", with consideration for conservation, biodiversity and ecosystem integrity; and due regard to social responsibility and the economic viability of the fishery.

During the assessment process the key outcomes evaluated and documented by the Assessment Team included:

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

Outcome summaries for Section A-F of the Full Assessment and Certification Report can be found in Section 6. Click here to jump to section 6.

Please note that the website references provided in this report were correct at the time of the assessment.

Recommendations

Recommendation of the Assessment Team

The Assessment Team recommend that the management system of the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

Peer Reviewer A's main summary and recommendation states:

I have thoroughly reviewed the FAO-based responsible fisheries management certification full assessment and certification report. I find it to be a comprehensive, well supported review, and I concur with the assessors' determination and recommendation that the Alaska pollock fisheries from 0-200 miles be certified as sustainable and responsibly managed under FAO criteria. The report clearly and positively supports all FAO-based criteria focusing on responsible fisheries management. All background information on the fishery (species life history, fishery location and method, fishery management, and stock assessment) was very comprehensive and well written. The team competently provided sufficient, pertinent data and references to demonstrate the high level of confidence awarded for conformance of all six major components. All 13 fundamental clauses and their 122 sub-clauses were adequately addressed. Only minor edits were suggested, most dealing with spelling or sentence structure issues. With regard to the six major components:

- The fishery management system under state and federal guidance was clearly articulated. The Alaska pollock fishery is one of the world's largest. It is also one of the world's most precisely managed with great attention to science and a transparent regulatory process.
- The science behind the fishery management and stock assessment activities is well founded, peer reviewed and exhaustively documented.
- Sections addressing the precautionary approach are solid and provide more than sufficient examples to complete a high evidence adequacy rating.
- Management measures are clearly addressed for both federal and state-managed fisheries. History of management adoptions is fully explained. Documentation is strong, and thorough.
- Fishery implementation, catch documentation, and enforcement are more than suitably addressed. Clear and concise examples are presented to justify the high evidence confidence rating.
- Ecosystem and fishery impacts are carefully articulated. The narrative comprehensively addresses measures taken to reduce impacts, and how they are positively working and maturing. Sources of evidence are well documented.

Peer Reviewer B's main summary and recommendation states:

The overall impression is that of a well managed major fishery with sound fishing practices and with stocks in a good shape. The documentation supporting the evaluation clauses is extensive and the conclusions are generally well justified.

I have made comments to some of the clauses. The essence of my comments can be summarized in the following points:

- Stock identity and migration patterns. This relates both to ensuring that individual stock components are not over-exploited and to international relations.
- The process leading to a final TAC is complex, and criteria used in some of the steps are not clearly outlined.
- Lack (apparently) of performance testing of the current harvest rule with implications for the handling of uncertain assessments and for the ability to obtain a long term yield close to the maximum.
- Ability to adapt the management to changing environment, given that regime shifts are recognized as a potential problem in this area.

Comments on the general part (Section 3)

This section has been reviewed mostly as an informative overview rather than as a review of the evidence for the clauses. It covers the relevant ground, with a good deal scientific detail, which is appreciated, but sometimes lacks the broad overview that would be useful for someone who is not familiar with the area and with US fisheries management. Some points that would improve this section:

There could be a more comprehensive overview of stock structure and management units that can be used as reference elsewhere. That may include a discussion of stock separation, and of consistency between management units and biological sub-stocks.

More extensive use of maps would be useful, showing e.g. fishing grounds, spawning areas, migration routes, management areas etc., preferably in a consistent lay-out to facilitate the understanding of the links between e.g. stock distributions, management areas and fishing practices. Such maps should also have names of places and areas that are referred to in the text. That would help to understand stock structure, management and fishery. The information about cannibalism is slightly confusing. Apparently, small (<40 cm) pollock feeds on euphausiids and other crustaceans, while adult pollock in the Bering Sea have 44% young pollock in their stomachs. One would like to know if cannibalism is strong enough to create negative feedback in the population dynamics. The list of acronyms is very useful but not quite complete - there are still a few more in the text. Ideally, it could be made even more useful by including a few explanatory sentences to acronyms relating to concepts and standards, and perhaps even a cross reference.

Note. All Peer Review comments were addressed by the Assessment Team. The Peer Review reports can be found in Section 8 along with the Assessment Team responses to comments made.

Determination: The appointed members of the Global Trust Certification Committee met on the 6th December 2011. After a detailed discussion, the Committee determined that the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

II. Schedule of Key Assessment Activities

Assessment Activities	Date (s)
Application Date	April 2010
Initial Site Visit Consultation Meetings	June –July 2010
Initial Validation Assessment Report	April 2011
Appointment of Full Assessment Team	July 2011
On-site Witnessed Assessment and Consultation Meetings	August 2011
Draft Assessment Report	August - November 2011
External Peer Review	November 2011
Final Assessment Report	December 2011
Certification Review/Decision	6th December 2011

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***Validation Report Prepared by*:** Dave Garforth, Vito Ciccia Romito, Stephen Grabacki.

IV. Acronyms

ABC	Allowable Biological Catch
ADFG	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
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
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	Metric tons
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
nm	Nautical miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPAFC	North Pacific Anadromous Fish Commission
NPFMC	North Pacific Fishery Management Council
OFL	Overfishing Level
OLE	Office for Law Enforcement
OY	Optimum Yield
PWS	Prince William Sound
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. Introduction

The US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BoF) management, fished with pelagic trawl gear (within Alaska's 200 nm EEZ) was assessed against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2. The application was made by the Alaska Seafood Marketing Institute (ASMI) on behalf of the Alaska pollock commercial fishery and participants, and was validated by Global Trust Certification Ltd.

This Assessment and Certification Report documents the assessment procedure for the certification of commercially exploited Alaska pollock to the FAO-Based RFM Certification Program. This is a voluntary program for Alaska fisheries that has been supported by ASMI who wishes to provide an independent, third-party certification program that can be used to verify that Alaska pollock fisheries are responsibly managed according to the FAO Code of Conduct for Responsible Fisheries.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification in accordance with EN45011/ISO/IEC Guide 65 accredited certification procedures. The assessment is based on the criteria specified in the FAO CCRF and the minimum criteria set out for marine fisheries in the FAO Guidelines for the Eco-Labeling of Fish and Fishery Products from Marine Capture Fisheries (2005/2009), hereafter referred to as the FAO-Based RFM Conformance Criteria.

The assessment is based on 6 major components of responsible management derived from the FAO CCRF and Guidelines for the Eco-labeling of products from marine capture fisheries.

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

These six major components are supported by 13 fundamental clauses which in turn are sustained by 122 sub-clauses. Collectively, these form the FAO-Based Conformance Criteria Version 1.2 against which a capture fishery applying for RFM assessment and certification is assessed.

The assessment comprised of application review, validation reporting, assessment planning, assessment and verification reporting, Peer Review and Certification Committee review and decision. Two site visits were made to the fishery during the assessment.

A summary of the consultation meetings is presented in Section 5. Assessors comprised of both externally contracted fishery experts and Global Trust internal staff (Appendix 1). Peer Reviewers comprised of externally contracted fisheries experts (Appendix 2).

This report documents each step in the assessment process and the recommendation to the Certification Committee of Global Trust who presided over the certification decision, the 6th December 2011, according to the requirements of ISO/IEC Guide 65 accredited certification.

1.1 Recommendations of the Assessment Team

Recommendation of the Assessment Team

The Assessment Team recommend that the management system of the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

2. Fishery Applicant Details

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3. Background to the Fishery

3.1. Species Biology

Growth, Movement and Reproduction

Alaska pollock, also known as walleye pollock (*Theragra chalcogramma*), is a member of the cod family and are broadly distributed throughout the North Pacific with the largest concentrations found in the Eastern Bering Sea (EBS). Walleye pollock spawn in shallow (90 to 200 m) waters of the outer EBS continental shelf (Figure 1). Oceanic spawning has been reported over waters 640 m deep, south of Seward, Alaska, and in the Aleutian basin. Spawning aggregations of walleye pollock in the EBS occur near Bogoslof Island, north of Unimak Island and the Alaska Peninsula, and around and Northwest of the Pribilof Islands, while in the Gulf of Alaska, they occur mainly in the Shelikof Strait and the Shumagins islands. Spawning in the Bering Sea occurs at temperatures of 1 to 3°C. However, temperature at time of spawning is apparently not as important for the Shelikof Strait spawning population. Some spawning may also occur under the sea ice. Pollock migrate seasonally 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.

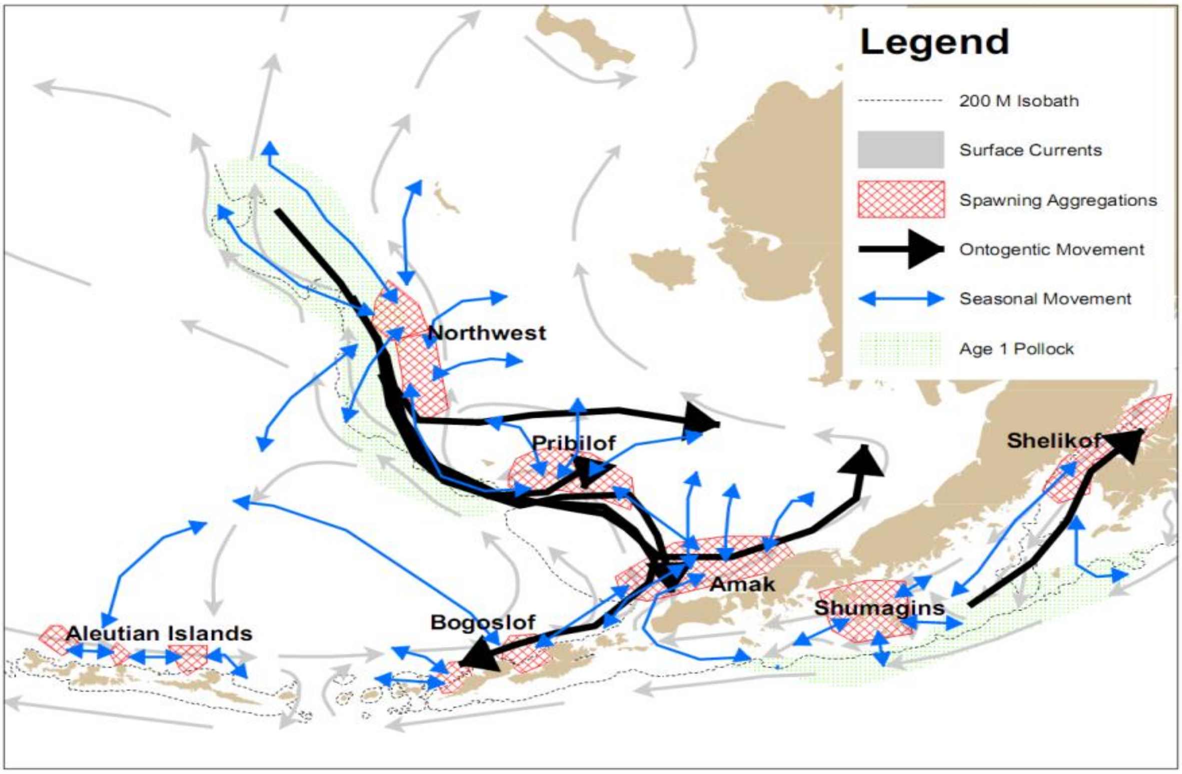


Figure 1. Spawning aggregations and pollock movements along the Eastern Bering Sea shelf, Aleutian Islands and the Central and Western Gulf of Alaska (Shelikof/Shumagins).

In the Bering Sea, spawning begins in late February. Fish in the southeastern Bering Sea spawn first. Most spawning occurs from late March to mid June, with a peak in May. In the western Gulf of Alaska, it was found that more than 85% of pollock adults had spawned prior to their earliest sampling in May, indicating that most spawning occurred in March and April. Spawning and pre-spawning fish move high in the water column, forming dense schools. Eggs are planktonic and are found primarily within 30 m of the surface. Pollock begin to recruit to the spawning population at age two, but age classes four and five contribute most to potential reproduction of the population.

Estimates of individual female fecundity are difficult to achieve because ovaries of female pollock contain oocyte populations composed of two or three size classes. The percent of each size class released during spawning is uncertain. Pollock breed yearly. Length of incubation is dependent upon temperature. Incubation time from fertilization to 50% hatching is 10 days at 10°C but up to 27.4 days at 2°C. Newly hatched larvae are 3.5 to 4.4 mm in length and apparently float upside-down at the water surface. The yolk sac is absorbed at about 7.0 to 7.5 mm (22 days at 2°C). Pollock enter the fishery around age 3 and live to 15 years or more.

Feeding Ecology

In the Bering Sea, euphausiids (or commonly known as krill, shrimp-like marine crustacean) are the most important food for pollock under 400 mm (Figure 2). Fish make an important contribution to the diet of adult Bering Sea pollock, making up 70% of stomach contents by volume in a study done by the department in 1978. Pollock larvae (4.8 to 17.7 mm standard length) from the Bering Sea consume mainly copepod nauplii and eggs and adult copepods (especially *Oithona similis*). Copepods are, however, consumed only by small (less than 200 mm) pollock. Studies in the Bering Sea have shown that small (young of the year and one-year-old) pollock comprise at least 44% by weight of the total stomach contents of adult pollock. Cannibalism has been pointed out as an important regulative process in pollock, especially in the Bering Sea (Dwyer et al. 1987). In the Gulf of Alaska system, cannibalism is not as prevalent, and it is minimized by the relative non-overlapping distribution of adults and juveniles (Shima et al. 2002.) In the Bering Sea, the tolerance of juveniles to water <2˚C may be an adaptation to provide them with a refuge from adult predators. Thus there is a complicated scenario of predation and cannibalism in the Bering Sea, where the population may be self regulating through cannibalism, but where there is an interaction with thermal refuges, prey availability (Sogard and Olla, 1996), and removal of large predators by fishing.

In the Southeastern Gulf of Alaska, it was found that small (less than 250 mm) walleye pollock ate mostly planktonic crustaceans, particularly euphausiids, mysids, and copepods, while large pollock (larger than 349 mm) generally ate larger prey, such as shrimp and fish. Cannibalism was observed in only 1% of the stomachs; however, few pollock greater than 450 mm have been examined. Pollock feed mainly in the shallow (90 to 140 m) waters of the outer continental shelf, where tidal mixing occurs in the spring. Juveniles follow a diel vertical movement, rising to feed on zooplankton near the surface at night. In the Bering Sea, pollock feeding activity is concentrated in the summer months (June - August). Pollock feed very little or not at all during the spawning period (April - mid May).

Figure 2. Euphausiids, most important food for pollock under 400 mm. Picture by Dave Forcucci available at: http://www.pmel.noaa.gov/foci/ice07/FOCI_Ice2007_log.html.

Habitat and Distribution

Walleye pollock are schooling fish, 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 is been observed that age 0 pollock avoid depths where water temperature is less than approximately 2.5 to 3.0°C. Age 0 pollock begin to settle to the bottom in the fall months, after which they mainly occupy semi demersal waters. By autumn of their first year, pollock are primarily distributed over the middle shelf, whereas age 1 pollock in the following summer primarily occupy the outer shelf to the Northwest of the Pribiliof Islands (Figure 2.1). Concentrations of adult walleye pollock in the Bering Sea are usually found in water temperatures between 2 and 4°C.

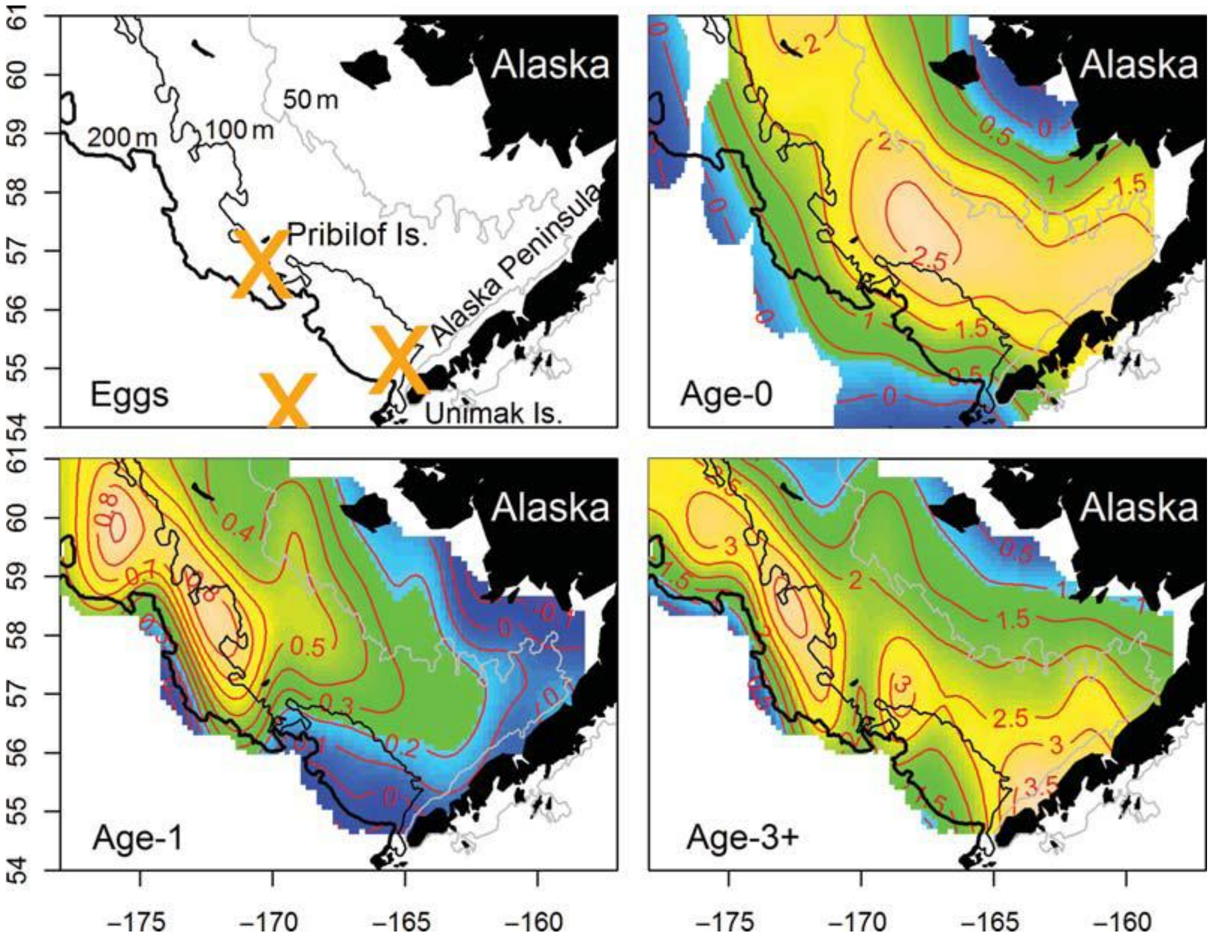
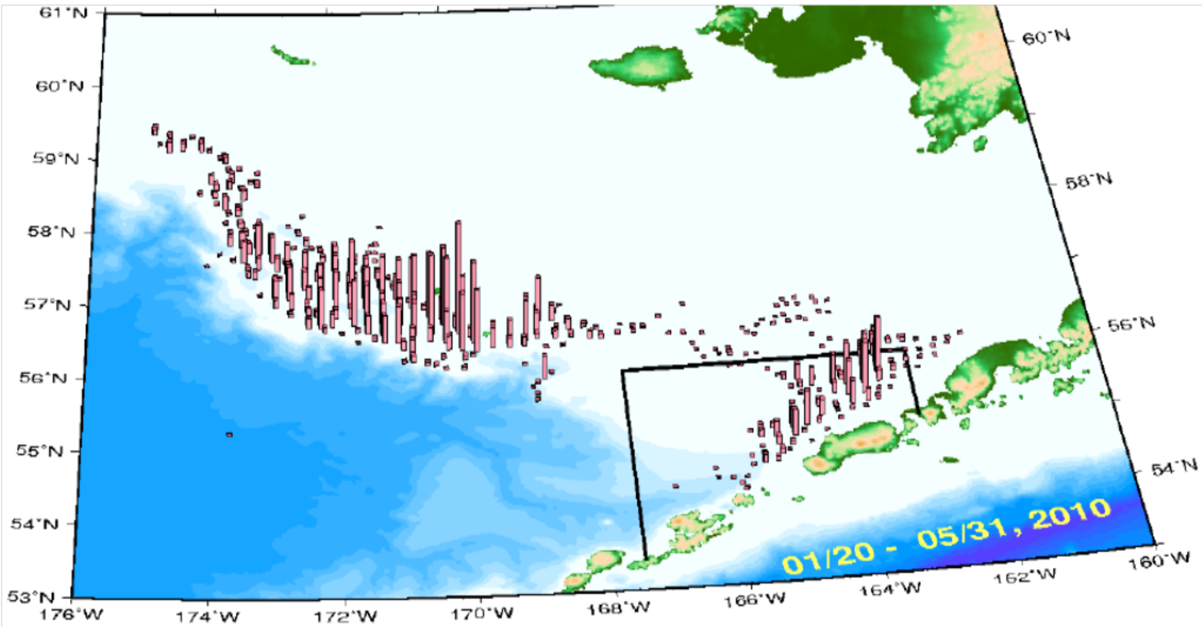


Figure 2.1. Distribution of pollock at various life stages, including the main pollock eggs concentrations collected by NOAA's FOCI programme (Bacheler et al., 2010), smoothed distribution of age-0 walleye pollock in autumn from Bering-Aleutian Salmon International Survey (BASIS) research programme, smoothed distribution of age-1 (80–199 mm), and age 3+ walleye pollock (≥300 mm) during summer averaged over 1982–2009 NMFS bottom-trawl surveys. (From Mueter *et al*. 2011 http://icesjms.oxfordjournals.org/content/68/6/1284.full.pdf).

Fishing Grounds in the Bering Sea/Aleutian Islands (BSAI) and the Gulf of Alaska (GOA)

The figures below taken from the 2011 Pollock Stock Assessment and Fishery Evaluation (SAFE) Reports for the BSAI and the GOA show the fishing grounds and main catches of Pollock in Alaska for 2010 in the BSAI (Figure 2.2) and for 2009 in the GOA (Figure 2.3).



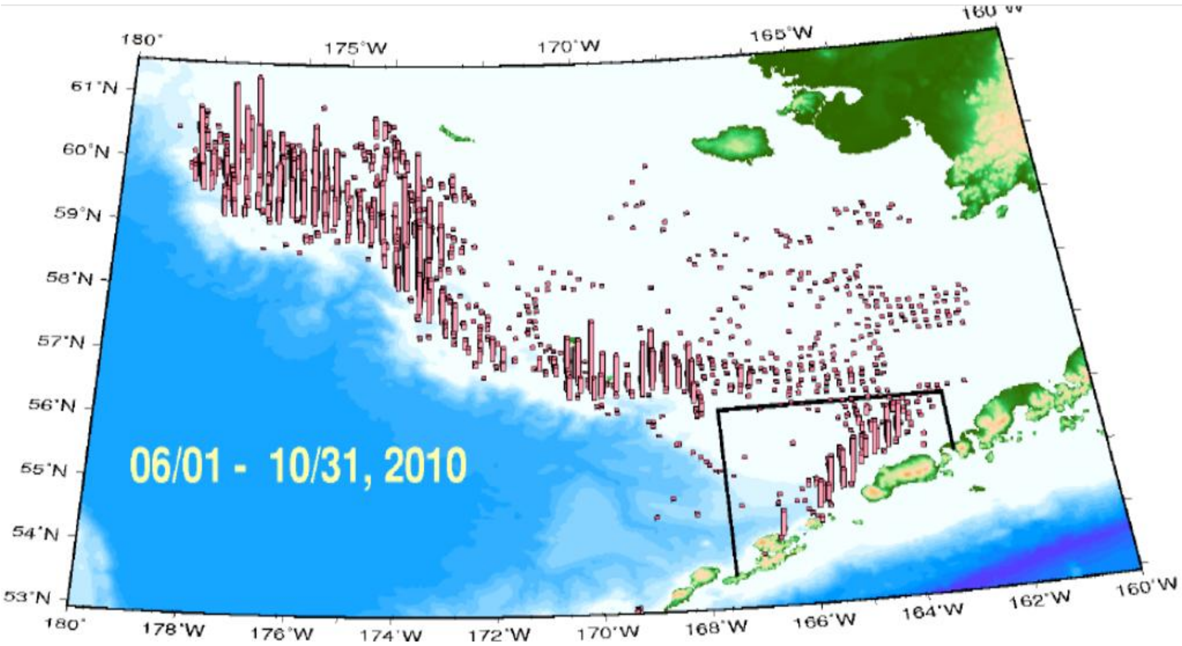


Figure 2.2. Pollock catch distribution in the BSAI during January - May and June - October 2010. The line delineates the catcher-vessel operational area (CVOA) and the height of the bars represents relative removal.

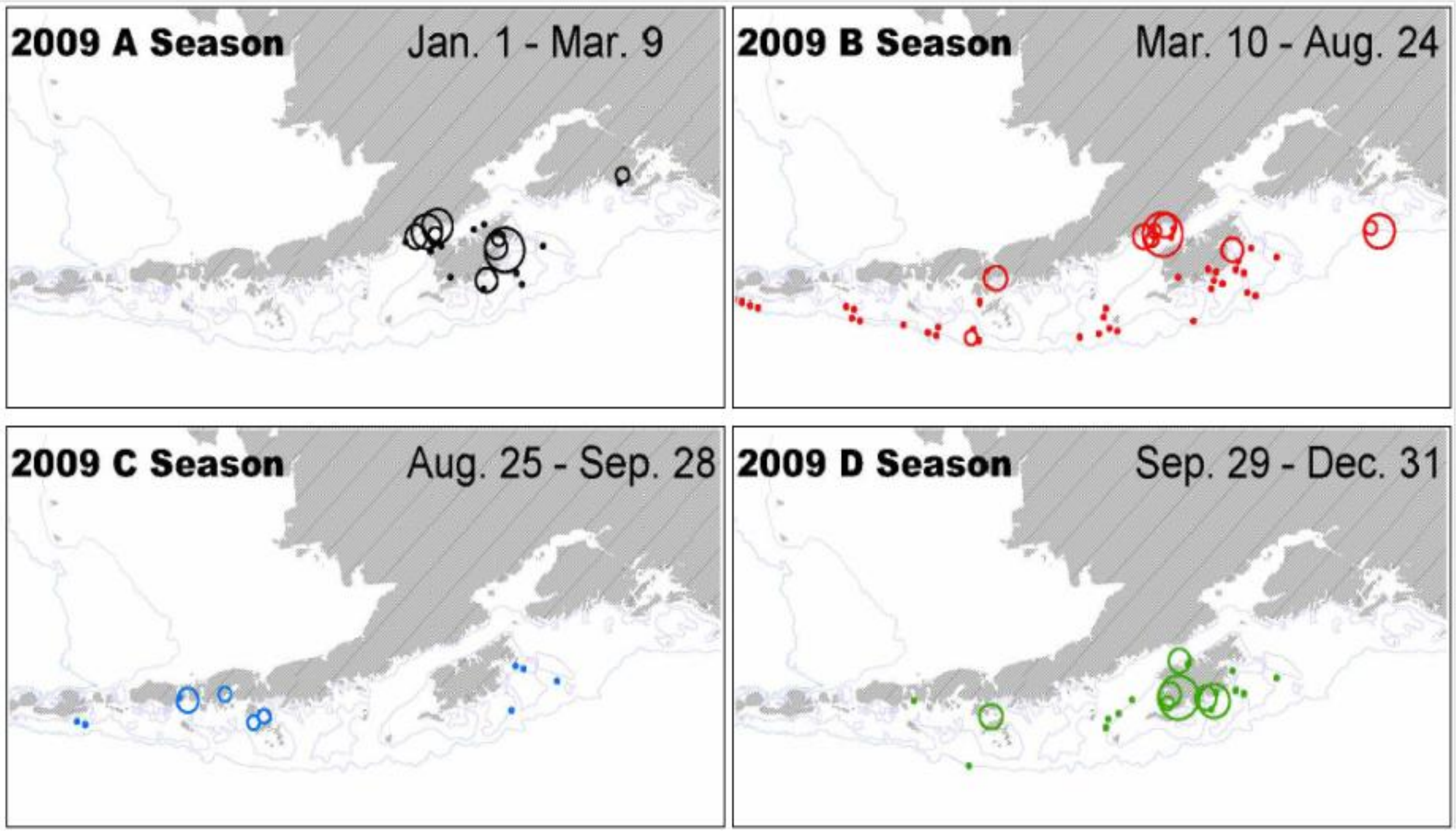


Figure 2.3. Pollock catch in 2009 by 20 X 20 km blocks by season in the Gulf of Alaska as determined by observer-recorded haul retrieval locations. Blocks with less than 1.0 t of pollock catch are not shown. The size of the circle is proportional to the catch.

General Status, Trends, and Threats

The pollock fishery is the largest fishery by volume in the United States. The biomass of pollock in the eastern Bering Sea is currently at a medium level relative to recent (post-1978) levels and appears to be decreasing. Pollock biomass in the Gulf of Alaska is relatively low but increasing. Populations in neither area are considered neither overfished nor approaching overfished conditions.

Although localized depletion of pollock in the eastern Bering Sea may occur as a result of commercial exploitation, pollock apparently have the ability to rapidly repopulate areas where localized depletion may have occurred. In Prince William Sound, where a relatively small, state-managed fishery occurs, pollock survey biomass estimates from the biennial bottom trawl survey have declined recently, and fishery harvest levels have been reduced as a result. Recent genetic studies provided evidence suggesting that spawning aggregations in some areas in or adjacent to the Gulf of Alaska, such as Prince William Sound, may be sufficiently different to merit management as distinct stocks.

Concerns about habitat degradation of the ocean bottom resulting from bottom trawling for pollock have largely been addressed by conversion of the fishery in the eastern Bering Sea to pelagic trawl gear. Similar concerns about habitat degradation in the Gulf of Alaska led to a prohibition on trawling east of 140° W longitude. Pollock is considered essential prey for Steller sea lions and management measures, such as fishery time and area closures around critical sea lion 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 Steller sea lions.

Key references

http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.main
http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm
http://www.nwfsc.noaa.gov/publications/techmemos/tm44/walleyepollock.htm
http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf

3.2. Fishery Location and Method

Stock Distribution

Walleye pollock (*Theragra chalcogramma*) are distributed broadly in the North Pacific Ocean and eastern and western Bering Sea. In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes. Eastern Bering Sea pollock occurs on the Eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; in the Aleutian Islands Region encompassing the Aleutian Islands shelf region from 170˚W to the U.S.-Russia Convention line; and in the Central Bering Sea-Bogoslof Island region. These three management stocks undoubtedly have some degree of exchange. The Bogoslof stock forms a distinct spawning aggregation that has some connection with the deep water region of the Aleutian Basin. In the Russian EEZ, pollock are considered to form two stocks, a western Bering Sea stock centered in the Gulf of Olyutorski, and a northern stock located along the Navarin shelf from 171˚E to the U.S.-Russia Convention line.

The three management stocks of pollock within Alaska's Eastern Bering Sea occur largely within the Alaska EEZ, but North West migration of pollock, results in a very small proportion of the Eastern Bering Sea shelf pollock to be found in the Cape Navarin area of Russia. Pollock migrate seasonally between spawning and feeding areas. For the latest year of data available, 2009, the Alaska EEZ contained more than 99% of the pollock stock. This can be seen in Table 7 (as well as previous years) and in Figure 6 of the document "Results of the Acoustic-Trawl Survey of Walleye Pollock (*Theragra chalcogramma*) on the U.S. and Russian Bering Sea Shelf in June - August 2009 (DY0909)". These surveys are largely carried out by the U.S. (apart from 2002 which was conducted by Russia). U.S. management takes into consideration this small migration by treating it as natural mortality and subsequently applying the appropriate harvest control rules as illustrated in the EBS pollock SAFE Report.

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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. 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. These meetings have also resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea. Bailey et al. (1999) present a thorough review of population structure of pollock throughout the north Pacific region. Genetic differentiation using microsatellite methods suggested that populations from across the North Pacific Ocean and Bering Sea were similar. However, weak differences were significant on large geographical scales and conform to an isolation-by-distance pattern.

There are 2 management areas in the Bering Sea and Aleutian Islands (BSAI): the eastern Bering Sea (EBS) and the Aleutian Islands (AI) region (Figure 3).

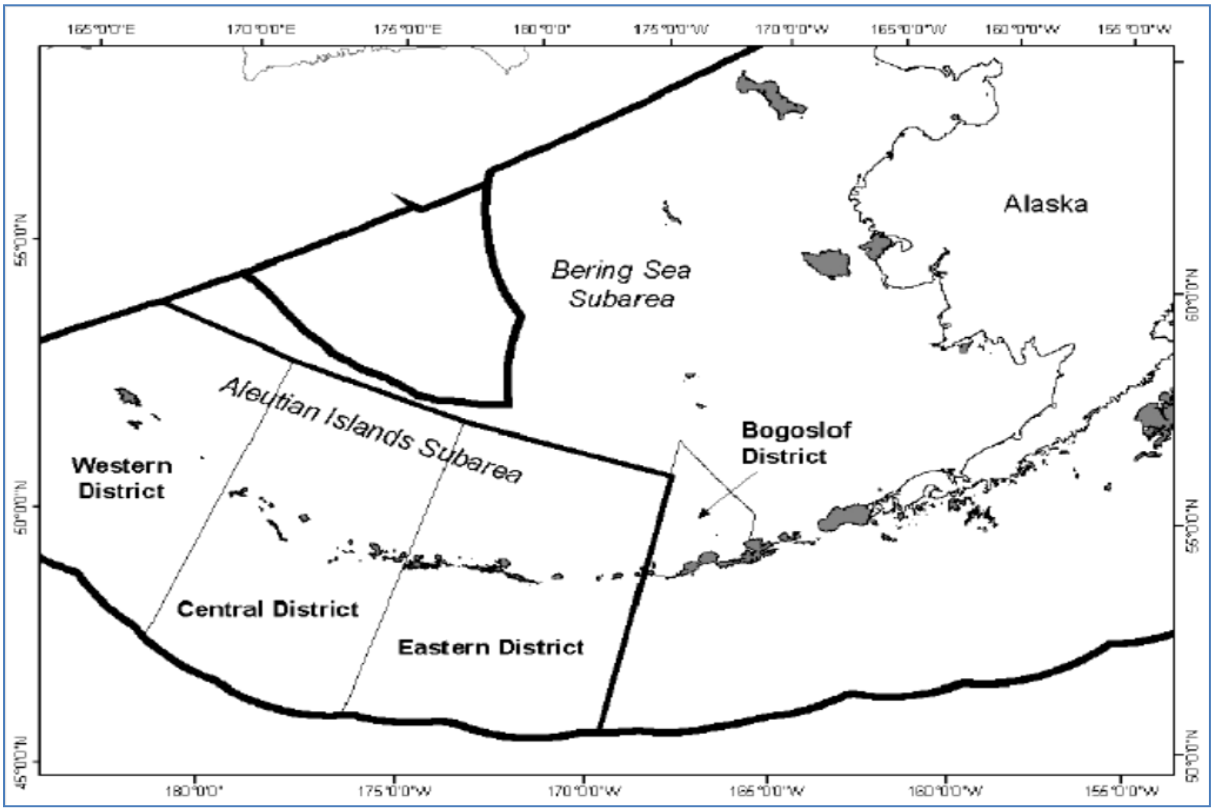


Figure 3. Subareas and districts of the BSAI management area ([Bering Sea and Aleutian Islands Groundfish Fishery Management Plan]() (updated 1/10).

Pollock in the Gulf of Alaska are managed as a single stock independently of pollock in the Bering Sea and Aleutian Islands. The separation of pollock in Alaskan waters into eastern Bering Sea and Gulf of Alaska stocks is supported by analysis of larval drift patterns from spawning locations, genetic studies of allozyme frequencies, mtDNA variability, and microsatellite allele variability.

The results of studies of stock structure in the Gulf of Alaska are equivocal. There is evidence from allozyme frequency and mtDNA that spawning populations in the northern part of the Gulf of Alaska (Prince William Sound and Middleton Island) may be genetically distinct from the Shelikof Strait spawning population. However significant variation in allozyme frequency was found between Prince William Sound samples in 1997 and 1998, indicating a lack of stability in genetic structure for this spawning population. Olsen et al. (2002) suggested that interannual genetic variation may be due to variable reproductive success, adult philopatry, source-sink population structure, or utilization of the same spawning areas by genetically distinct stocks with different spawning timing. Peak spawning at the two major spawning areas in the Gulf of Alaska occurs at different times. In the Shumagin Island area, peak spawning apparently occurs between February 15th - March 1st, while in Shelikof Strait peak spawning occurs later, typically between March 15th and April 1st. It is unclear whether the difference in timing is genetic, or a response to differing environmental conditions in the two areas.

The Gulf of Alaska management area encompasses the U.S. Exclusive Economic Zone (EEZ) of the North Pacific Ocean, exclusive of the Bering Sea, between the eastern Aleutian Islands at 170˚W longitude and Dixon Entrance at 132˚40' W longitude (Figure 3.1). Note, the use of any gear other than non-trawl gear is prohibited at all times in the Southeast Outside district as defined in the GOA Groundfish FMP. The area is illustrated below in the far right section of the Eastern Regulatory Area. Also, the use of non-pelagic trawl gear is prohibited in Cook Inlet north of a line extending between Cape Douglas and Point Adam.

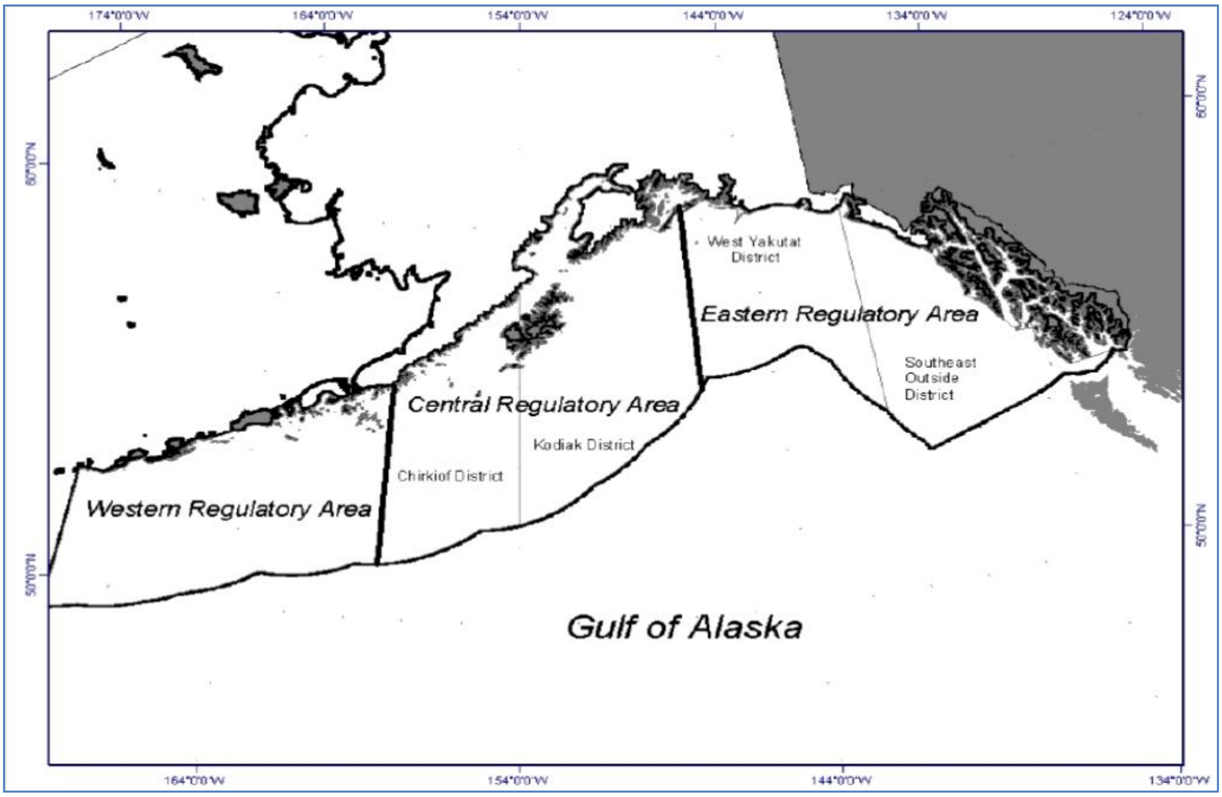
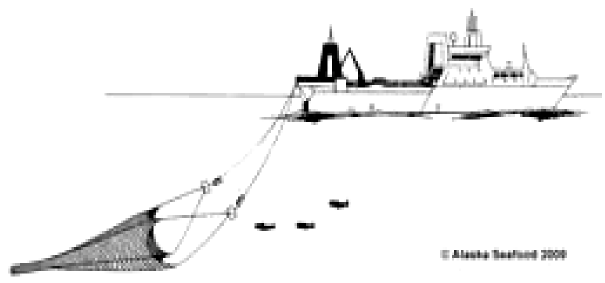


Figure 3.1. Regulatory Areas of the Gulf of Alaska (Gulf of Alaska Groundfish Fishery Management Plan, updated 10/11).

Fishing Method

Trawl gear

Pollock in Alaska are caught and legally landed by trawlers using pelagic gear. Pelagic trawl is the only legal gear in both the BSAI and GOA for directed pollock fishing in federal and state waters. Trawlers are generally large boats and can reach up to 600 feet in length. A trawl is a large, bag-shaped net that is towed by a fishing vessel. The doors, because of the way they are built and rigged to the trawl, keep the mouth of the trawl open as it moves through the water. The headrope is equipped with floats forming the upper opening and the footrope is rigged with weights forming the lower opening. Trawlers use sophisticated ultrasonic devices both for location of fish underwater and for species identification. Upon locating a school of the desired species, the vessel trawls through the school and captures the fish. Electronic sensors tell the harvester exactly where the trawl is in relation to the fish and the ocean floor, while other sensors report how full the trawl becomes. The net is retrieved using huge winches and a power drum upon which the net is rolled as it is brought aboard.



If the vessel has the ability to process the fish onboard, it is called a factory-trawler or a freezer-trawler or catcher-processor. These vessels simply pull the net aboard, empty the net, sort the species, and process the catch. If the vessel is only capable of catching fish, then it must deliver the catch to a processing plant. These processing plants might be in other vessels, called floating processors (motherships), or they might be on shore.

http://www.adfg.alaska.gov/static/fishing/PDFs/commercial/whatkindofboat_cf.pdf
http://www.ciaprochef.com/alaskaseafood/harvesting-whitefish.html

3.3. Fisheries Management and Organization

The North Pacific Fishery Management Council. The NPFMC is one of eight regional councils established by the Magnuson Fishery Conservation and Management Act in 1976 [in short 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 (i.e. Chum Salmon Savings Area) and area restrictions (i.e. protected/conservation areas), bycatch reduction programs, Prohibited Species Catch (PSC) Limits, reporting and observers 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.

The National Marine Fisheries Service. The NOAA's NMFS is responsible for the management, conservation, and protection of living marine resources within the US EEZ. The NMFS Alaska Regional Office oversees fisheries in federal waters (3-200 nm) that produce about half the fish caught in US waters, with responsibilities covering 842,000 square nautical miles off Alaska. NOAA's Alaska Fisheries Science Center (AFSC) annually assesses the abundance of pollock. The AFSC conducts yearly bottom trawl surveys to assess pollock abundance in the Eastern Bering Sea. Scientists also conduct acoustic trawl surveys every two years (yearly from 2006-2010) to estimate the abundance of pollock living off the bottom. In the GOA, the AFSC conducts trawl surveys to assess the abundance of pollock every two years; and a yearly Shelikov Strait Echo Integration Trawl (EIT) Survey. In addition to biological studies, stock survey and stock assessment reports, NMFS is charged with carrying out the federal mandates of the U.S. Department of Commerce with regard to commercial fisheries such as approving and implementing FMPs and FMP amendments recommended by the Council. The U.S. Coast Guard partners the NMFS's Office for Law Enforcement (OLE) for effective monitoring, control and enforcement of fisheries regulations.

Alaska Department of Fish and Game. In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the Board of Fisheries (BOF) using a Guideline Harvest Level (GHL) strategy. Biomass is estimated by bottom trawl surveys in summer and hydroacoustic surveys in winter. In 1999 the BOF directed the ADFG to establish 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 for pollock (where state allows federal species TAC to be harvested in 0-3 nm waters) 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. An example of a Federal fishery regulation that was concurrently adopted by the BOF is the Steller sea lion protection measures implemented in 2001. The effort in the patrol and enforcement of state waters regulations is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT).

http://www.fakr.noaa.gov/npfmc/index.html
http://www.fakr.noaa.gov/
http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html
http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html
http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.management
http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm
http://www.nmfs.noaa.gov/ole/
http://www.dps.alaska.gov/awt/Marine.aspx

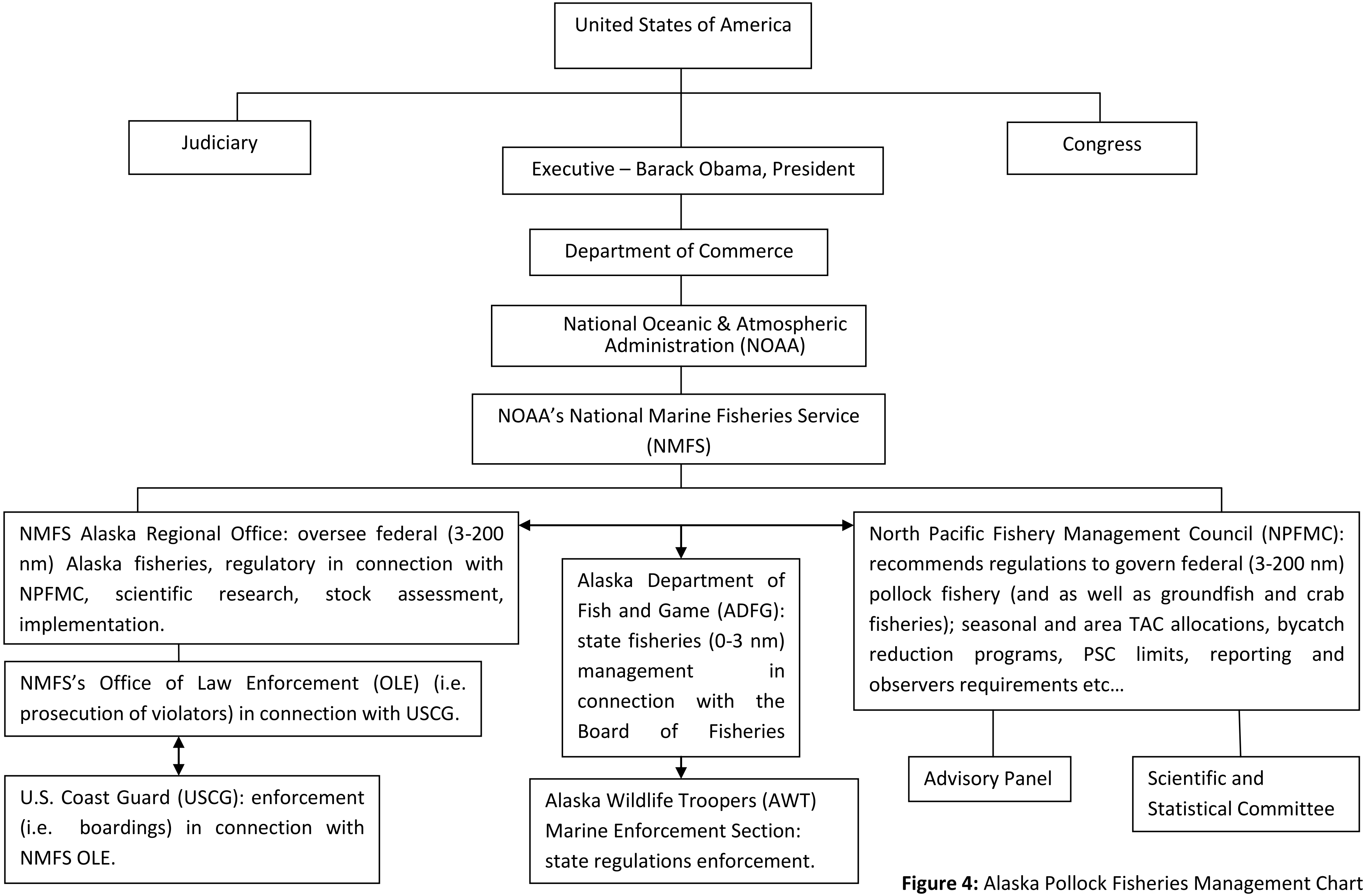


Figure 4: Alaska Pollock Fisheries Management Chart

Important dates relevant to Alaska pollock management

1970s-80s – Fishing fleet is primarily foreign.
1976 – United States extends fisheries management authority to 200 miles but allows "surplus" pollock to be caught by foreign fishing fleets operating under agreement within the U.S. fishery conservation zone.
1978 – Gulf of Alaska Groundfish Fishery Management Plan implemented.
1982 – Bering Sea/Aleutian Islands Groundfish Fishery Management Plan implemented.
1988 – U.S. fishing and fish processing capacity is sufficient to complete the phase out of foreign fleets fishing for pollock in U.S. waters.
1992 – Management measures implemented to protect Steller sea lions; for example, areas around sea lion rookeries closed to pollock fishing during breeding and birthing season.
1992 – Bogoslof Region closed to directed pollock fishery.
1994 – The United States and Russia lead effort to conclude a multi-lateral treaty to regulate fishing for pollock in international waters beyond the fishery management zones of both countries. The resulting Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea places a moratorium on pollock fishing until fish stocks in international waters are healthy enough to be harvested.
1998– "Improved Retention/Improved Utilization" program implemented – pollock caught must be kept even if not the targeted species and unintentional catches are counted towards the total allowable pollock catch.
1998 – Congress passes the American Fisheries Act (AFA), facilitating the formation of fish harvesting cooperatives that have resulted in numerous conservation benefits, including resolving issues of fishing overcapacity.
1999 – Aleutian Island subarea closed due to concerns with Steller sea lion recovery.
2000 – Standards added to management plans based on vessel size, type, and ownership to regulate pollock cooperatives, ensuring consistency with American Fisheries Act of 1998.
2005 – Aleutian Islands subarea reopened but catch cannot exceed 19,000 tons.
2008 – Eastern Bering Sea stock drops below its target population level due to a period of below-average recruitments (from 2001-2005); survey observations show that the near-term outlook should be improving due to above-average recruitment from the pollock born in 2006.
2010 – Eastern Bering Sea stock is estimated to be above target levels.

http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm

History of the Eastern Bering Sea (EBS) Pollock fishery

In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes. These are: Eastern Bering Sea (EBS) which consists of pollock occurring on the Eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; the Aleutian Islands Region encompassing the Aleutian Islands shelf region from 170˚W to the U.S.-Russia Convention line; and the Central Bering Sea—Bogoslof Island pollock. These three management stocks undoubtedly have some degree of exchange. The Bogoslof stock forms a distinct spawning aggregation that has some connection with the deep water region of the Aleutian Basin.

From 1954 to 1963, EBS pollock catches were low until directed foreign fisheries began in 1964. Catches increased rapidly during the late 1960s and reached a peak in 1970-75 when they ranged from 1.3 to 1.9 million ton 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 ton ranging from 0.815 million ton in 2009 to nearly 1.5 million ton during 2003-2006 (Table 5). United States vessels began fishing for pollock in 1980 and by 1987 they were able to take 99% of the quota.

Prior to the domestication of the pollock fishery, the catch was monitored by placing observers on foreign vessels. Since 1988, only U.S. vessels have been operating in this fishery. By 1991, the current NMFS observer program for north Pacific groundfish fisheries was in place. The international zone of the Bering Sea, commonly referred to as the —Donut Hole is entirely contained in the deep water of the Aleutian Basin and is distinct from the customary areas of pollock fisheries, namely the continental shelves and slopes.

Japanese scientists began reporting the presence of large quantities of pollock in the Aleutian Basin in the mid-to-late 1970's. By the mid-late 1980s foreign vessels were intensively fishing in the Donut Hole. In 1984, the Donut Hole catch was 181 thousand ton. The catch grew rapidly and by 1987 the high seas pollock catch exceeded that within the U.S. Bering Sea EEZ. The extra-EEZ catch peaked in 1989 at 1.45 million ton and has declined sharply since then. By 1991 the Donut Hole catch was 80% less than the peak catch, and catch in 1992 and 1993 was very low. A fishing moratorium was enacted in 1993 and only trace amounts of pollock have been harvested from the Aleutian Basin by resource assessment fisheries.

Table 5. Catch from the Eastern Bering Sea by area from 1999 to 2010 (preliminary). The southeast area refers to the EBS region east of 170W; the Northwest is west of 170W.

	Eastern Bering Sea		
Year	Southeast	Northwest	Total
1999	783,119	206,697	989,816
2000	839,175	293,532	1,132,707
2001	961,975	425,219	1,387,194
2002	1,159,730	320,465	1,480,195
2003	933,316	557,584	1,490,900
2004	1,089,999	390,544	1,480,543
2005	802,418	680,868	1,483,286
2006	826,980	659,455	1,486,435
2007	728,094	626,003	1,354,097
2008	482,542	508,023	990,566
2009	358,314	452,417	810,731
2010	251,283	553,907	805,190

(http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf)

History of the Aleutian Islands (AI) Pollock fishery

Pollock are distributed throughout the Aleutian Islands (AI) with concentrations in areas and depths dependent on diel and seasonal migration. The population of pollock in the AI is characterized by a sharp drop in abundance between 1986 (444,000 t) and 1994 (78,000 t) with a relatively slow but steady increase in abundance since then. The nature of the pollock fishery in the Aleutian Islands Region has varied considerably since 1977 due to changes in the fleet makeup and in regulations.

During the late 1970s through the 1980s the fishing fleet was primarily foreign and joint venture (JV) where US catcher vessels delivered to foreign motherships. The last JV delivery was conducted in 1989 when the domestic fleet began operating in earnest. The distribution of observed catch differed between the foreign and JV fishery (1977-1989) and the domestic fishery (1989-2009). In 1999 the North Pacific Fishery Management Council (NPFMC) closed the Aleutian Islands region to directed pollock fishing due to concerns for Steller sea lion recovery.

In 2003 the entire AI pollock quota was allocated to the Aleut Corporation and in 2005 the directed fishery was reopened. The fishery was still restricted to areas outside of 20 nmi of Steller Sea lion rookeries and haulouts, limiting fishing to two small areas with commercial concentrations of pollock within easy delivery distance to Adak Island. Bycatch of Pacific Ocean perch (POP) can be very high in both these areas and it appears that pollock and POP share these areas intermittently; depending on time of day, season, and tide. Although there may be other areas further west that may have commercial concentrations of pollock, to date there have been no attempts by the reopened directed fishery to explore these areas.

Two catcher processor vessels attempted directed fishing for pollock in February 2005, but failed to find commercially harvestable quantities outside of Steller sea lion critical habitat closure areas and in the end removed less than 200 tons of pollock. In addition, bycatch rates of Pacific Ocean perch were prohibitively high in areas where pollock aggregations were observed. The 2005 fishery is thought to have resulted in a net loss of revenue for participating vessels.

In 2006 and 2007 the Aleut Corporation, in partnership with the Alaska Fisheries Science Center (AFSC), Adak Fisheries LLC and the owners and operators of the F/V Muir Milach, conducted the Aleutian Islands Cooperative Acoustic Survey Study (AICASS) to test the technical feasibility of conducting acoustic surveys of pollock in the Aleutian Islands using small (<32 m) commercial fishing vessels (Barbeaux and Fraser 2009). This work was supported under an exempted fishing permit that allowed directed pollock fishing within Steller sea lion critical habitat. A total of 932 t and 1,100 t of pollock were harvested during these studies in 2006 and 2007 respectively, and biological data collected during the studies were treated in the stock assessment as fishery data.

In 2008 additional surveys of Aleutian Islands region pollock in the same area were conducted on board the R/V Oscar Dyson and in cooperation with the F/V Muir Milach; the work was funded through a North Pacific Research Board grant and less than 10 ton of groundfish were taken for the study. In 2009 the directed pollock fishery in the Aleutian Islands region took 403 ton and 1,326 ton were taken as bycatch in other fisheries, predominantly the Pacific cod and rockfish fisheries.

In 2010 financial problems with the Adak processing plant greatly hindered the directed fishery and as of October 2, only 50 ton had been taken in the directed fishery while 1,055 ton were taken as bycatch in other fisheries. Since 2005 the TAC has been constrained to 19,000 ton or the ABC, whichever is lower, by statute.

The Aleutian Islands pollock catch in the last 6 years has averaged less than 10% of the TAC (Table 6 below).

Table 6. Time series of Allowable Biological Catch (ABC), TAC, Overfishing Level [(OFL) equivalent to catch at MSY level)] and total catch for Aleutian Islands Region walleye pollock fisheries 2005-2010.

Year	ABC	TAC	OFL	CATCH	TAC%
2005	29,400	19,000	39,100	1,621	9%
2006	29,400	19,000	39,100	1,745	9%
2007	44,500	19,000	54,500	2,519	13%
2008	28,160	19,000	34,040	1,278	7%
2009	26,873	19,000	32,553	1,729	9%
2010	33,100	19,000	40,000	1,238*	7%

* As of October 24, 2010

(http://www.afsc.noaa.gov/REFM/docs/2010/AIpollock.pdf).

History of the Bogoslof (BOG) Pollock fishery

The Bogoslof region is noted for having distinct spawning aggregations that appear to be independent from pollock spawning in nearby regions. The Bogoslof management district (INPFC area 518) was established in 1992 in response to fisheries and surveys conducted during the late 1980s, which consistently found a discrete aggregation of spawning pollock in this area during the winter. The degree to which this aggregation represents a unique, self- recruiting stock is unknown but the persistence of this aggregation suggests some spawning site fidelity that called for independent management. The Bogoslof region pollock has also been connected with the historical abundance of pollock found in the central Bering Sea (Donut Hole) due to concentrations of pollock successively moving toward this region prior to spawning.

Japanese scientists first reported significant quantities of pollock in the Aleutian Basin in the mid-to-late 1970's, but large-scale fisheries in the Donut Hole only began in the mid-1980's. By 1987, significant components of these catches were attributed to the Bogoslof Island region; however, the actual locations were poorly documented. The Bogoslof fishery primarily targeted winter spawning-aggregations but in 1992, this area was closed to directed pollock fishing. In 1991, the only year with extensive observer data, the fishery timing coincided with the open seasons for the EBS and Aleutian Islands pollock fisheries (the Bogoslof management district was established in 1992 by FMP amendment 17). However, after March 23, 1991 the EBS region was closed to fishing and some effort was re-directed to the Aleutian Islands region near the Bogoslof district. In subsequent years, seasons for the Aleutian Islands pollock fishery were managed separately. Bycatch and discard levels were relatively low from these areas when there was a directed fishery (e.g., 1991). Updated estimates of pollock bycatch levels from other fisheries were small in recent years.

The increase in pollock bycatch in the last two years (9.29 t in 2008 to 130.56 t in 2010) can be attributed to the non-pelagic trawl arrowtooth flounder target fishery (Table 7 below).

Table 7. Pollock catch (tons) from 1999 to 2010 in the Bogoslof Region. Note that the catch results from bycatch allowances in other fisheries rather than from a directed pollock fishery.

Year	Ton
1999	29
2000	29
2001	258
2002	1,042
2003	24
2004	0.01
2005	0.02
2006	0.01
2007	0.03
2008	9.29
2009	73.14
2010	130.56

(http://www.afsc.noaa.gov/REFM/docs/2010/BOGpollock.pdf).

History of the Gulf of Alaska (GOA) pollock fishery

Pollock in the GOA are managed as a single stock independently of pollock in the Bering Sea and Aleutian Islands. The separation of pollock in Alaskan waters into eastern Bering Sea and GOA stocks is supported by analysis of larval drift patterns from spawning locations, genetic studies of allozyme frequencies, mtDNA variability, and microsatellite allele variability.

The commercial fishery for walleye pollock in the GOA started as a foreign fishery in the early 1970s and catches increased rapidly during the late 1970s and early 1980s. A large spawning aggregation was discovered in Shelikof Strait 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. The fishery was fully domestic by 1988.

The fishery for pollock in the GOA is entirely shore-based with approximately 90% of the catch taken with pelagic trawls. During winter, fishing effort targets pre-spawning aggregations in Shelikof Strait and near the Shumagin Islands. Fishing in summer is less predictable, but typically occurs on the east side of Kodiak Island and in nearshore waters along the Alaska Peninsula. Incidental catch in the GOA directed pollock fishery is low. For tows classified as pollock targets in the GOA between 2005 and 2009, on average about 94% of the catch by weight of FMP species consisted of pollock. Nominal pollock targets are defined by the dominance of pollock in the catch, and may include tows where other species were targeted, but where pollock were caught instead.

Kodiak is the major port for pollock in the GOA, with 63% of the 2005-2009 landings. In the western GOA, Sand Point, Dutch Harbor, King Cove, and Akutan are important ports, sharing 37% of 2005-2009 landings. Since 1992, the GOA pollock TAC has been apportioned spatially and temporally to reduce potential impacts on Steller sea lions. The general objective is to allocate the TAC to management areas based on the distribution of surveyed biomass, and to establish three or four seasons between mid-January and autumn during which some fraction of the TAC can be taken. The Steller Sea Lion Protection Measures implemented in 2001 established four seasons 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. Allocations to management areas 610, 620 and 630 are based on the seasonal biomass distribution as estimated by groundfish surveys. In addition, a new harvest control rule was implemented that requires suspension of directed pollock fishing when spawning biomass declines below 20% of the reference unfished level.

Table 8. Walleye pollock catch (t) in the Gulf of Alaska. The TAC for 2008 includes the guideline harvest level for the state-managed fishery in Prince William Sound (1650 t).

Year	*Foreign*	*Joint Venture*	*Domestic*	*Total*	*TAC*	*Research*
2000			73,080	73,080	94,960	56
2001			72,076	72,076	90,690	77
2002			51,937	51,937	53,490	78
2003			50,666	50,666	49,590	128
2004			63,934	63,934	65,660	53
2005			80,846	80,846	86,100	72
2006			71,976	71,976	81,300	63
2007			53,062	53,062	63,800	47
2008			52,500	52,500	53,590	26
2009			44,003	44,003	43,270	90
2010					77,150	37

(http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf).

The State managed pollock fishery

The Prince William Sound pollock fishery is managed using a harvest rate strategy, where the Guideline Harvest Level (GHL) is the product of the biomass estimate, instantaneous natural mortality rate (0.3) and a precautionary factor of 0.7. Biomass is estimated by bottom trawl surveys in summer and hydroacoustic surveys in winter. For the PWS State pollock fishery, "5 AAC 28.263 Prince William Sound Pollock Pelagic Trawl Management Plan" sets the regulation for the directed state pollock fishery. Originally, in the pollock state fishery of 2000, the BOF established an emergency regulation which established the PWS management plan, primarily as a means to increase protection of endangered Stellar Sea lions. The plan, subsequently adopted by the BOF, provided for the directed fishery to be apportioned among three sections of the inside district (-1 Bainbridge Section, -2 Knight Island Section, and -3 Hinchinbrook Section), with no more than 40% of the guideline harvest level taken in any one section. The commissioner's permit provided ADFG some annual flexibility to meet in-season management needs and was used to specify check-in and check-out requirements, catch reporting procedures, logbooks, and accommodation of a department observer if requested. The same management plan, established that during a directed pollock pelagic trawl fishery, the total bycatch weight of all species combined may not exceed five percent of the total round weight of the pollock harvested. Although pollock in the Gulf of Alaska are considered one stock, ADFG surveys of pollock in PWS are used to set the GHL, rather than calculating it as a fraction of the federal TAC for the GOA. Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. A parallel groundfish fishery occurs where the State allows the federal species TAC to be harvested in

State waters. Parallel fisheries occur for pollock, Pacific cod, and Atka mackerel species, for some or all gear types. Opening state waters allows the effective harvesting of fishery resources because many fish stocks straddle State and Federal jurisdiction and in some cases a significant portion of the overall federal TAC is harvested within State waters. Although the State cannot require vessels fishing inside state waters during the Federal fishery to hold a Federal permit, it can and does adopt regulations similar to those in place for the Federal fishery if those regulations are approved by the Board of Fisheries and meet State statute. An example of a Federal fishery regulation that was concurrently adopted by the Board of Fisheries is the Steller sea lion protection measures implemented in 2001. The PWS pollock fishery GHL and relative catch is presented in the table below.

Year	GHL (million lb)	Season Days	Vessels	Harvest (lb)
2000	3.1	70	4	2,256,504
2001	3.1	64	2	3,128,037
2002	3.8	70	3	2,364,143
2003	3.8	84	3	2,421,773
2004	2	68	3	1,928,458
2005	2	48	6	1,677,932
2006	3.6	58	8	3,486,449
2007	3.6	69	5	3,486,499
2008	3.6	56	5	1,395,933
2009	3.6	60	8	3,249,442
2010	3.6	42	11	3,664,919
2011	3.6	17	7	3,377,325

The reader is asked to keep in mind that the overwhelming majority of Alaska pollock is harvested in primarily in the BS and secondarily in the GOA (as shown in the table below), and is studied, managed, and enforced under the federal system (NPFMC and NMFS). This assessment therefore focuses primarily on the Bering Sea and the Gulf of Alaska pollock.

Year	Area	Catch (tons)	Percentage of Bering Sea (catch) + Gulf of Alaska (ABC)
2010	Bering Sea	805,190	91.25%
2010	Aleutian Islands	1,238	0.14%
2010	Bogoslof Island	130	0.014%
2010	Gulf of Alaska	(ABC) 77,150	8.74%
2010	Prince William Sound	1,666	0.18%

http://touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.management

3.4. Stock Assessments Methods and Practices

The EBS and GOA pollock stocks are assessed independently using statistical age structured assessment models. Catch at age models synthesize data on biomass and age composition from the fishery, bottom trawl, and echo integrated trawl surveys conducted by the Alaska Fisheries Science Center (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. Although only one model is selected for setting the Overfishing Level (OFL) and Allowable Biological Catch (ABC) for each stock, each model uses information on the status of the stock and potential effects of current management practices (http://www.afsc.noaa.gov/Education/ factsheets/10_Wpoll_FS.pdf).

EBS pollock Fishery

The scientific observer program is the fundamental data acquisition program for all biological and fishery data that feed into pollock stock assessment and management. For Alaska as a whole (not just EBS pollock), catcher processors and motherships (floating processors) have 200% observer coverage. Jointly, these highly observed vessels contribute circa 60% of the total catch. Catcher vessels over 125 ft have 100% coverage and each vessel over 60 ft (but less than 125 ft) has 30% of its fishing days observed. Vessels less than 60 ft are not observed. For EBS pollock, approximately 70-80% of the catch has been subject to direct observation. With impending salmon bycatch management arrangements, coverage of all vessels will be expanded to at least 100%. This increased coverage, in addition to increasing the overall EBS pollock catch observed to nearer 100%, will potentially overcome a potential shortcoming in the current design caused by the 30% coverage of smaller vessels being non-random and at the discretion of the vessel.

At-sea delivery is by five independent provider companies paid directly by fishery operators, but the Observer Service (responsible for design, analysis and quality assurance) is federally funded. At-sea observers collect samples from fish and incidentally caught species but also serve a compliance role. The Pollock Conservation Program (PCC) contracts with a private sector firm, Sea State, Inc., to monitor incidental catch. Sea State is authorised by the individual catcher/processor companies 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.

In addition to the fishery information provided through the observer program, the key stock assessment inputs for EBS pollock are derived from the bottom trawl survey (BTS) and the echo-integration trawl (EIT) survey. Work is also being carried out to extend the use of opportunistic acoustic data (OAD) information to study population responses to environmental changes and to use acoustic data collected from the BTS to “fill in” EIT information in years where the EIT does not operate.

The BTS is a general purpose, low headline, trawl survey aimed at providing information on a wide range of species. The BTS has been running since 1975 but with changed (standardised) trawl gear in 1982, has effectively run since that time. In 1987 new stations were added to the survey and from 1988 to present can be viewed as a continuous series. The survey is conducted using standardised gear and design on commercial vessels. The same two commercial vessels have been used continuously since 1994 and great care is used to standardise the results. The number of stations and survey duration has been fairly constant in that time although the survey timing has varied somewhat. The survey covers a 20 X 20 nm grid laid out over 12 zones spanning the whole EBS area. The only optimisation is for blue king crab for which additional stations are fished. There are no special measures or adjustments for pollock. However, consideration of pollock biological sampling has led to changes since 2006 in the way otoliths have been collected. Previously, otolith sampling was concentrated on low density pollock areas (not by design). This has now been attended to and it is hoped that age compositions will better reflect pollock distribution and density patterns; this will need to be tested. Other recent changes include a pre-emptive extension to the north in expectation of pollock distributional expansion with warming (climate change). It is unclear how this expansion will be designed and how biomass estimates will be modified.

The BTS provides important information on annual pollock spatial distribution, on recruitment (as age 1) and on total biomass, as well as age composition data. The BTS is especially efficient at selecting 1 year old pollock (selectivity appears to be about 50%) but not 2 and 3 year olds which are distributed higher in the water column. The BTS is conducted using commercial vessels equipped with Simrad ES60s. Work is in progress to integrate backscatter within the headrope height (and above the acoustic dead zone) to produce pollock CPUE estimates that can be combined with the trawl estimates to provide a single estimate.

The EIT is a dedicated pollock survey, independent of the BTS. It has been operating since 1979, initially triennially, then biennially and since 2006 annually due to additional effort associated with the BSIERP and Loss of Sea Ice Program (LOSI). Pollock are an ideal acoustic subject, having strong backscatter and forming large, reasonably unmixed schools. The methods to estimate numbers and biomass are relatively straightforward, working up echo integration data to estimated numbers *via* application of length frequency data and target strength at length relationships to develop appropriate mean acoustic cross sections. Appropriate biological sampling using a variety of mid water nets to permit numbers estimation is undertaken during EIT cruises.

The natural mortality of pollock has been the subject of an extensive National Stock Assessment Workshop held during 2009 at AFSC. Based on the combination of the now relatively standard Lorenzen form for natural mortality at age and a logistic model for older fish scaled to maturation, that workshop developed a vector with a similar form to that used in recent assessments (high age 1 mortality, declining with age) but with generally higher values of natural mortality for ages 3 through 15. MSY-related reference point estimates as used in Tier 1 harvest control rules are potentially sensitive to the values of natural mortality used in the stock assessment. The vector of natural mortalities used in recent and the current stock assessment assumes a constant value of 0.3 for ages 3 and older, 0.45 at age 2 and 0.9 at age 1. These values for young ages are lower than suggested by the recent workshop or from multispecies assessments, and therefore appear conservative with respect to FMSY estimation (because FMSY correlates positively with natural mortality for any given partial exploitation pattern).

The EBS pollock assessment uses a statistical catch at age model which fits a (very) large number of parameters to define annual, age-specific selectivities for each component (fishery, trawl survey, echo integration survey), each with its own catchability parameter. Although a statistical model allowing for age composition errors, the high parameterisation effectively allows the age data to be fit very closely and the age compositions are highly influential in the model fit and subsequent advice. It is important to ensure that the best possible age reading is available but also to ensure that errors in ageing are appropriately captured in the quantities of interest to management, especially in the Tier 1 regime where a reliable *pdf* of FMSY is required, ideally through appropriate use of an age transition matrix in the model fitting. The otolith collection by observers in the fishery, and from trawl and echo integration surveys, is high and there is clearly sufficient thought given as to sampling intensity. With regard to method, otoliths are read using any of three methods (surface reading, break and burn, and baking). Despite that, review of the EBS pollock stock assessment in late 2010 recommended that the ageing procedures and consistency statistics be reconsidered in the future and that consideration be given as to whether or not a new age transition matrix should be developed and used at least for assessment sensitivity testing.

For the EBS pollock fishery, a statistical age-structured assessment model conceptually outlined in Fournier and Archibald (1982) and similar to Methot's (1990) extensions was applied over the period 1964-2010. The analysis was first introduced in the 1996 SAFE report and compared to the cohort analyses that had been used previously. The current model also was documented in the Academy of Sciences National Research Council (Ianelli and Fournier 1998). The model was implemented using automatic differentiation software developed as a set of libraries under the C++ language (AD Model Builder).

The main changes from the 2009 analyses include:

- The 2010 EBS bottom trawl survey estimate of population numbers-at-age was added.
- The 2010 EBS AT survey estimate of population numbers-at-age were included using an age length key from the 2010 BTS survey data.
- The 2009 EBS AT survey estimate of population numbers-at-age were updated from 2009's values by using age-length keys from the 2009 AT survey data.
- A time series of relative errors (precision) for the AT survey abundance data were used from 1994-2010. This error was scaled to have an average coefficient of variation equal to what was assumed as constant in previous assessments (i.e., 20% CV).
- The 2009 fishery age composition data were added. An index of abundance from 2006-2009 was added to the model. This index is based on Honkalehto et al (*In Review*) using acoustic backscatter data recorded aboard vessels conducting the bottom trawl survey.
- The age-determination error was re-evaluated and use of an updated conversion matrix was explored. The ability to omit the most recent recruitment estimates from stock-recruitment relationship was added. While this should maintain the observation errors appropriately, they appear to have undue influence (relative to other year classes) on the stock-recruitment relationship and consequently affect stock productivity/resiliency estimates (noting that recent data indicating strong 2006 and 2008 year classes appears to have come from relatively low spawning biomass levels).

The female spawning stock biomass is estimated to be above the Bmsy level for 2011 and is increasing and presently projected to be well above Bmsy by 2012. Several factors affected the change in the maximum permissible Tier 1a ABC levels and all had a uni-directional impact. These factors include:

- Increased average weight-at-age estimates for 2009 compared to what was assumed in the 2009 assessment.
- Revised numbers at age estimates from the 2009 AT survey (due to age data becoming available) indicated slightly more age-3 pollock than from the preliminary data presented last year.
- Greater-than-anticipated biomass estimates from the two 2010 surveys.
- A lower statistical weight for the 2009 AT data due to the estimated relative precision (through sampling) of surveys in different years.
- Signs of a strong 2008 year class.

- Spawning biomass is estimated to be above the Bmsy level sooner than anticipated hence the adjustment to the target fishing mortality rate is removed and,
- The fact that the 2006 and 2008 above-average year classes occurred at relatively low spawning biomass levels results in increased estimates of stock productivity/resiliency.

The available data indicate that the spawning biomass for 2011 is projected to be above the level expected from the 2010's assessment. Since the stock is estimated to comprise many immature (three year old) pollock in 2011 and that it is recovering from recent low levels, the recommended ABC (1,267,000 t) is below the maximum permissible (Tier 1a) level. The Tier 1a overfishing level (OFL) is estimated to be 2,447,000 t.

ftp://ftp.afsc.noaa.gov/afsc/public/pollock/CIE/2010_08_05%20Stokes%20AFSC%20Bering%20Sea%20pollock%20stock%20assessment%20review%20report.pdf

http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf

GOA pollock fishery

The data used in the 2010 GOA pollock assessment model consist of estimates of annual catch (in tons), fishery age composition, NMFS summer bottom trawl survey estimates of biomass and age composition, echo integration trawl (EIT) survey estimates of biomass and age composition in Shelikof Strait, egg production estimates of spawning biomass in Shelikof Strait, ADFG bottom trawl survey estimates of biomass and length and age composition, and historical estimates of biomass and length and age composition from surveys conducted prior to 1984 using a 400-mesh eastern trawl. Binned length composition data are used in the model only when age composition estimates are unavailable, such as the fishery in the early part of the modelled time period and the most recent survey. The NOAA's Fisheries Oceanography Coordinated Investigations (FOCI) year class prediction is used qualitatively, along with other information, to evaluate the likely strength of incoming year classes.

The trawl surveys have been conducted by AFSC every three years (beginning in 1984) to assess the abundance of groundfish in the GOA. Starting in 2001, the survey frequency was increased to every two years. The survey uses a stratified random design, with 49 strata based on depth, habitat, and management 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 poly-Nor'eastern high opening bottom trawls rigged with roller gear. In a typical survey, 800 tows are completed. On average, 70% of these tows contain pollock.

The time series of pollock biomass used in the assessment model is based on the surveyed area in the Gulf of Alaska west of 140° W lon., obtained by adding the biomass estimates for the Shumagin, Chirikof, Kodiak INPFC areas, and the western portion of Yakutat INPFC area. Biomass estimates for the west Yakutat region were obtained by splitting strata and survey CPUE data at 140° W lon. For surveys in 1984 and 1987, the average percent in West Yakutat in the 1990-99 surveys was used. The average was also used in 2001, when West Yakutat was not surveyed. An adjustment was made to the survey time series to account for unsurveyed pollock in Prince William Sound.

Echo integration trawl (EIT) surveys to assess the biomass of pollock in the Shelikof Strait area have been conducted annually since 1981 (except 1982 and 1999). Survey methods and results for 2010 are presented in a NMFS processed report (Guttormsen et. al. in review). Biomass estimates using the Simrad EK echosounder from 1992 onwards were re-estimated to take into account recently published work of eulachon acoustic target strength (Gauthier and Horne 2004). Previously, acoustic backscatter was attributed to eulachon based on the percent composition of eulachon in trawls, and it was assumed that eulachon had the same target strength as pollock. Since Gauthier and Horne (2004) determined that the target strength of eulachon was much lower than pollock, the acoustic backscatter could be attributed entirely to pollock even when eulachon were known to be present. In 2008, the noise-reduced *R/V Oscar Dyson* became the designated survey vessel for acoustic surveys in the Gulf of Alaska. In winter of 2007, a vessel comparison experiment was conducted between the *R/V Miller Freeman* and the *R/V Oscar Dyson*, which obtained an OD/MF ratio of 1.132 in Shelikof Strait. Additional EIT surveys in winter 2010 covered the Shumagin Islands spawning area, Sanak Gully, Morzhovoi Bay, Pavlov Bay, Chirikof, and Marmot Bay. An exploratory survey along the Kenai Peninsula and through Prince William Sound found significant quantities of pollock.
Estimates of spawning biomass in Shelikof Strait based on egg production methods were included in the latest assessment model. The estimates of spawning biomass in Shelikof Strait showed a pattern similar to the acoustic survey.

The 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 Tanner crab and red king crab, walleye pollock and other fish are also sampled. Standardized survey methods using a 400-mesh eastern trawl were employed from 1987 to the present. The survey is designed to sample a fixed number of stations from mostly nearshore areas from Kodiak Island to Unimak Pass, and does not cover the entire shelf area. The average number of tows completed during the survey is 360. Details of the ADFG trawl gear and sampling procedures are in Blackburn and Pengilly (1994).

Estimated catch is by the NMFS Regional Office from shoreside electronic logbooks and observer estimates of at-sea discards. Catches include the state-managed pollock fishery in Prince William Sound. Since 1996 the pollock Guideline Harvest Level (GHL) for the PWS fishery has been deducted from the ABC by the NPFMC Gulf of Alaska Plan Team for management purposes.

Estimates of fishery age composition were derived from at-sea and port sampling of the pollock catch for length and ageing structures (otoliths). Pollock otoliths collected during the 2009 fishery were aged using the revised criteria described in Hollowed et al. (1995), which involved refinements in the criteria to define edge type. Catch age composition was estimated using methods described by Kimura and Chikuni (1989). Age samples were used to construct age-length keys by sex and stratum. These keys were applied to sex and stratum specific length frequency data to estimate age composition, which were then weighted by the catch in numbers in each stratum to obtain an overall age composition.

To assess qualitatively recent trends in abundance, each survey time series was standardized by dividing the annual estimate by the average since 1987. Shelikof Strait EIT survey estimates prior to 2008 were rescaled to be comparable to subsequent surveys conducted by the *R/V Oscar Dyson*. Although there is considerable variability in each survey time series, a fairly clear downward trend is evident to 2000, followed by a stable, though variable, trend (Fig. 1.9). All surveys show a strong increase in the last two years. Both the NMFS and ADFG bottom trawl surveys are above the long-term average in the last two years, while the Shelikof Strait EIT survey is slightly below the long-term average in 2010.

An age-structured model covering the period from 1961 to 2010 (50 yrs) was used in 2010 to assess GOA pollock. This is essentially the same model that has been used since the 1999 assessment. Population dynamics were modelled using standard formulations for mortality and fishery catch. Year- and age-specific fishing mortality was modeled as a product of a year effect, representing the full-recruitment fishing mortality, and an age effect, representing the selectivity of that age group to the fishery. The age effect was modeled using a double-logistic function with time-varying parameters. The model was fit to time series of catch biomass, survey indices of abundance, and estimates of age and length composition from the fishery and surveys.

Relative to the 2009 assessment, the following changes have been made in the current assessment.

New Input data

1. Fishery: 2009 total catch and catch at age.
2. Shelikof Strait EIT survey: 2010 biomass and age composition.
3. NMFS bottom trawl survey: 2009 age composition.
3. ADF&G crab/groundfish trawl survey: 2010 biomass and length composition.

Assessment results

The model estimate of spawning biomass in 2011 is 198,767 t, which is 28.8% of unfished spawning biomass (based on average post-1977 recruitment) and below *B40%* (276,000 t), thereby placing Gulf of Alaska pollock in sub-tier “b” of Tier 3. New ADFG crab/groundfish and Shelikof Strait EIT surveys were conducted in 2010. The Shelikof Strait EIT survey showed an increase of 62% from the 2009 biomass estimate. The ADFG crab/groundfish survey showed a decline of 15% from the 2009 biomass estimate, but is still up 60% from the mean of the previous three years. The aggregate biomass from Winter EIT surveys, which is not used in the model, is similar to the model estimate of total biomass at spawning, lending support to model estimates of an increase in stock size. The abundance of mature fish in 2011 is projected to be 17% higher than in 2010, and is projected to increase further over the next five years.

The author’s 2011 ABC recommendation for pollock in the Gulf of Alaska west of 140° W lon (W/C/WYK) is 88,620 tons, an increase of 15% from the 2010 ABC. This recommendation is based a more conservative alternative to the maximum permissible *FABC* introduced in the 2001 SAFE. The OFL in 2011 is 118,030 tons. In 2012, the recommended ABC and OFL are 114,054 tons and 151,030 tons, respectively.

http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf

3.5 Historic Biomass and Removals in the Alaska Pollock Fishery

The Figures below (5 and 6) represent female spawning biomass and catch data, landings of pollock and bycatch of pollock in other fisheries (counted against the catch limits). When the U.S. extended its fisheries management jurisdiction out to 200 miles offshore in 1976, U.S. fishermen or processors were not engaged in the Alaska pollock fishery. Initially, the U.S. allowed foreign fishing and fish processing vessels to harvest and process "surplus" pollock. By the late 1980s, U.S. fishermen and processors fully harvested available pollock quotas and foreign fleets were phased out. The majority of the U.S. catch of pollock comes from the Bering Sea. From 1977-2010 the annual catch of eastern Bering Sea pollock has averaged 1.17 million tons. Since 2001, the average has been above 1.28 million tons. However, the average 2009 and 2010 catch has dropped to 0.81 million tons due to stock declines and resulting reductions in allowable harvest levels.

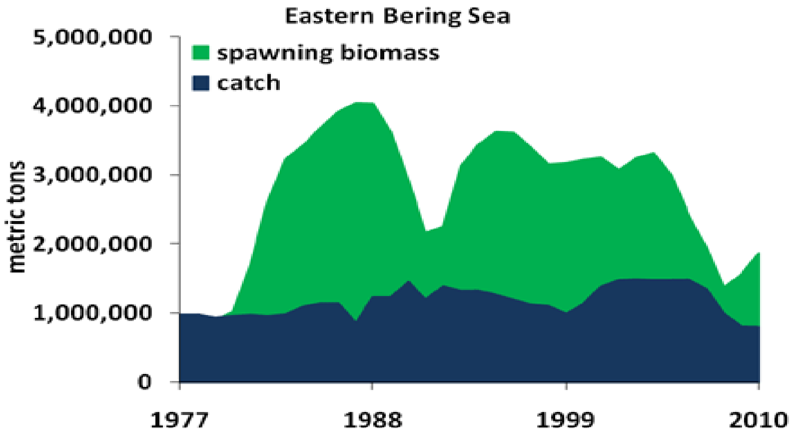


Figure 5. Female spawning biomass and catch data in the EBS from 1977 to 2010.

The commercial fishery for walleye pollock in the Gulf of Alaska started as a foreign fishery in the early 1970s. Catches increased rapidly during the late 1970s and early 1980s (Figure 6). A large spawning aggregation was discovered in Shelikof Strait in 1981, and a fishery developed for which pollock roe was an important product. The fishery was fully domestic by 1988, and declines were witnessed until the mid 90s. Catch and biomass has been somewhat stable since then and 2011 spawning stock biomass is predicted at > 28% the unfished level, and increasing.

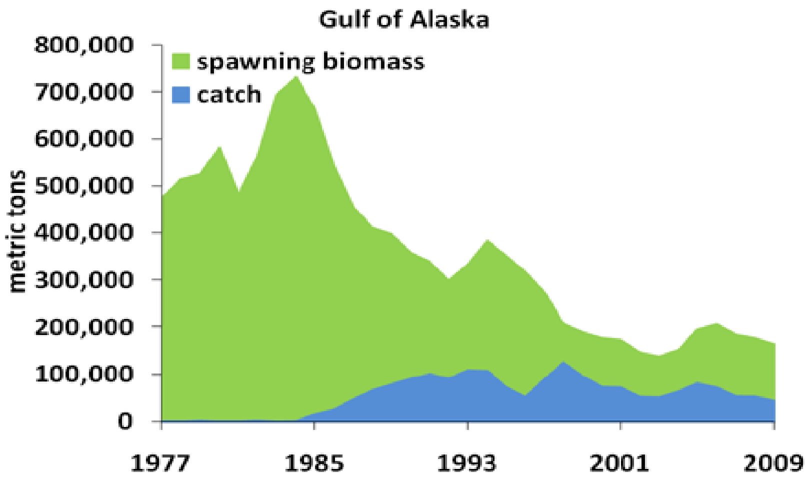


Figure 6. Female spawning biomass and catch data in the GOA from 1977 to 2009.
http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm

Incidental catch of the pollock fishery

GOA fishery

Incidental catch in the Gulf of Alaska directed pollock fishery is low. For tows classified as pollock targets in the Gulf of Alaska between 2005 and 2009, on average about 94% of the catch by weight of FMP species consisted of pollock (Table 9). Nominal pollock targets are defined by the dominance of pollock in the catch, and may include tows where other species were targeted, but where pollock were caught instead.

The most common managed species in the incidental catch are arrowtooth flounder, Pacific cod, flathead sole, Pacific ocean perch, miscellaneous flatfish, and the shortraker/rougheye rockfish complex. The most common non-target species are squid, eulachon, various shark species (e.g., Pacific sleeper sharks, spiny dogfish, salmon shark), jellyfish, and grenadiers. Bycatch estimates for prohibited species over the period 2005-2009 are given in Table 9.

Table 9. Incidental catch (t) of FMP species (upper table) and non-target species (bottom table) in the walleye pollock directed fishery in the Gulf of Alaska in 2005-2009. Incidental catch estimates include both retained and discarded catch. The "other" FMP species group in the upper table is broken down by species (or less inclusive species groupings) in the lower table.

Managed species/species group	*2005*	*2006*	*2007*	*2008*	*2009*
Pollock	80097.8	69774.8	49815.5	46735.3	37719.0
Arrowtooth flounder	2313.4	2747.5	1630.0	1554.6	730.7
Pacific cod	352.3	709.8	276.4	578.7	556.3
Other (sharks, skates, squid, sculpin, octopus, but excluding skates in 2004)	924.6	1805.5	676.9	200.6	381.0
Flathead sole	180.2	594.4	329.6	414.0	213.9
Shortraker and rougheye rockfish	32.6	96.5	81.4	101.5	29.7
Pacific Ocean perch	35.5	71.2	29.8	49.9	20.4
Rex sole	21.1	153.6	44.8	57.4	35.5
Miscellaneous flatfish	4.6	438.8	157.0	230.2	17.0
Atka mackerel	3.5	15.2	200.2	0.1	0.0
Sablefish	3.6	5.6	3.2	1.3	0.1
Dover sole and Greenland turbot	0.7	11.7	5.5	5.8	2.4
Pelagic shelf rockfish complex	2.1	9.0	6.4	4.1	1.5
Unidentified skate	1.2	5.0	9.4	5.9	2.5
Big and longnose skate	6.7	35.8	64.8	45.3	63.2
Northern rockfish	0.8	14.5	12.0	7.9	4.2
Other rockfish complex	1.3	2.5	2.0	4.5	0.1
Thornyheads	0.3	0.2	0.3	0.2	0.1
Percent non-pollock	*4.6%*	*8.8%*	*6.6%*	*6.5%*	*5.2%*

Non target species/species group	*2005*	*2006*	*2007*	*2008*	*2009*
Squid	631.5	1517.8	405.2	77.9	313.6
Eulachon	826.8	392.3	219.0	756.1	216.8
Other osmerids	176.3	167.9	49.2	379.6	145.5
Pacific sleeper shark	199.3	153.5	58.9	47.2	30.2
Scyphozoan jellyfish	184.4	69.0	23.9	192.1	10.7
Grenadiers	53.9	73.1	4.7	249.3	29.0
Salmon shark	43.3	31.4	141.6	6.4	6.9
Spiny dogfish	15.8	50.0	47.6	59.6	17.6
Miscellaneous fish	16.5	38.4	24.1	35.0	37.9
Big skate	1.7	23.0	38.1	21.7	33.8
Other skates	35.2	40.9	13.9	4.3	10.4
Longnose skate	5.0	12.7	26.7	23.6	35.1
Large Sculpins	0.0	1.5	21.8	13.5	5.0
Skate, Other	1.2	5.0	9.1	5.9	2.6
Sea star	1.1	2.0	4.7	6.5	0.0
Pandalid shrimp	7.4	3.1	1.9	0.8	0.1
Octopus	0.1	3.4	1.5	0.0	0.1
Capelin	2.8	0.1	0.0	0.0	0.0
Sculpins	0.0	2.4	21.8	15.3	5.0
Sea anemone unidentified	0.0	0.2	0.7	0.3	0.0
Miscellaneous crabs	0.0	0.0	0.9	0.1	0.0
Stichaeidae	0.0	0.1	0.3	0.0	0.0
Snails	0.0	0.0	0.0	0.3	0.0
Sea pens whips	0.3	0.0	0.0	0.0	0.0
Eelpouts	0.1	0.0	0.0	0.0	0.1
Invertebrate unidentified	0.0	0.0	0.2	0.0	0.0

The EBS fishery

Since the pollock fishery is primarily pelagic in nature, the bycatch of non-target species is small relative to the magnitude of the fishery (Table 10). Jellyfish represent the largest component of the bycatch of non-target species and has been stable at around 5-6 thousand tons per year (except for 2000 when over 9,000 tons were caught). Skate bycatch has more than doubled in 2008 based on preliminary data. The data on non-target species shows a high degree of inter-annual variability which reflects the spatial variability of the fishery and high observation error. This variability may mask any significant trends in bycatch.

The catch of other target species in the pollock fishery represent less than 1% of the total pollock catch (Table 11). Nonetheless incidental catch of Pacific cod has increased since 1999 but is below the 1997 levels. The incidental catch of flatfish was variable over time and has increased slightly. Proportionately, the incidental catch has decreased since the overall levels of pollock catch have increased. The catch of prohibited species was also variable but showed noticeable trends (Table 12). For example, the level of crab bycatch drops considerably after 1998 when all BSAI pollock fishing was restricted to using only pelagic trawls. Recent levels of salmon bycatch have increased dramatically and current restrictions are under revision to help minimize this problem.

Table 10. Bycatch estimates (t) of non-target species caught in the BSAI directed pollock fishery, 2003-2010 based on observer data as processed through the catch accounting system (NMFS Regional Office, Juneau, Alaska).

Group	2003	2004	2005	2006	2007	2008	2009	2010
Jellyfish	5,592	6,495	5,084	2,657	2,156	3,722	3,731	2,174
Skates	462	829	693	1,258	1,182	2,301	1,635	1,076
Squid	952	717	699	893	962	374	119	77
Sharks	191	186	163	506	214	114	92	24
Sculpins	92	141	140	171	161	254	153	157
Eulachon	2	19	9	87	101	2	2	1
Eelpouts	1	1	1	21	119	7	2	0
Sea stars	89	7	10	11	5	7	5	5
Grenadier	20	10	9	9	11	4	1	1
Other osmerids	7	2	3	5	37	2	0	0
Octopus	9	3	1	2	4	3	4	1
Lanternfish	0	0	0	10	6	1	0	0
Sea pens, whips	1	1	2	2	4	1	2	2
Birds	0	0	2	0	1	0	0	0
Capelin	0	0	0	2	1	0	0	0
Other fish	98	88	147	140	198	102	59	134
Other invertebrates	2	2	11	5	6	7	2	2

Table 11. Bycatch estimates (t) of other **target species** caught in the BSAI directed pollock fishery, 1997-2010 based on then NMFS Alaska Regional Office reports from observers (*2010 data are preliminary*).

	Pacific Cod	Flathead Sole	Rock Sole	Yellowfin Sole	Arrowtooth Flounder	Pacific Ocean Perch	Atka Mackerel	Sablefish	Greenland Turbot	Alaska Plaice	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	1,740	1,419	210	618	935	762	48	40	7	67	11,814
2004	6,437	2,105	2,554	841	557	393	1,051	17	18	8	120	14,100
2005	7,413	2,352	1,125	63	651	652	677	11	31	45	125	13,145
2006	7,285	2,861	1,361	256	1,088	737	789	9	65	11	152	14,612
2007	5,627	4,228	510	86	2,794	624	315	12	107	3	188	14,494
2008	6,761	4,209	1,964	405	1,364	336	15	2	82	30	39	15,205
2009	7,876	4,652	7,534	269	2,143	114	25	2	44	176	25	22,861
2010	6,902	4,333	2,220	1,017	1,414	230	55	2	23	109	22	16,326
Average	6,110	2,813	2,021	621	1,126	457	306	13	67	44	268	13,845

Table 12. Bycatch estimates of prohibited species caught in the BSAI directed pollock fishery, 1997-2010 based on then NMFS Alaska Regional Office reports from observers. Herring and halibut units are in tons, all others represent numbers of individuals caught. Preliminary 2010 data are through October 28th, 2010.

	Herring	Red king crab	Other king crab	Bairdi crab	Opilio crab	Chinook salmon	Other salmon	Halibut
1997	1,089	0	156	6,525	88,588	43,336	61,504	127
1998	821	5,098	1,832	35,594	45,623	49,373	62,276	144
1999	785	0	2	1,078	12,778	10,187	44,585	69
2000	482	0	104	173	1,807	3,966	56,707	80
2001	224	38	5,135	86	2,179	30,107	52,835	164
2002	105	6	81	651	1,667	32,222	76,998	127
2003	913	54	9	792	762	47,015	191,892	77
2004	1,134	27	6	1,215	748	54,058	438,199	84
2005	610	0	1	651	2,299	67,351	696,865	101
2006	435	203	3	1,666	2,934	82,591	308,414	112
2007	345	8	3	1,516	3,219	121,462	87,182	270
2008	130	35	10	852	4,364	19,656	14,644	268
2009	40	1,137	20	6,026	7,179	12,119	45,720	437
2010	422	978	8,612	11,800	8,612	9,087	12,721	249

http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf

3.6. Economic Value of the Alaska Pollock Fishery

Alaska pollock has been the dominant species in the commercial groundfish catch off Alaska. The 2009 pollock catch of 854,900 tons accounted for 56% of the total groundfish catch of 1.5 million tons (Figure 12). The pollock catch decreased by about 18% from 2008 as a result of reductions in the TAC. Ex-vessel pollock value fluctuated around US $ 300 million since the late 1990s (Figure 13).

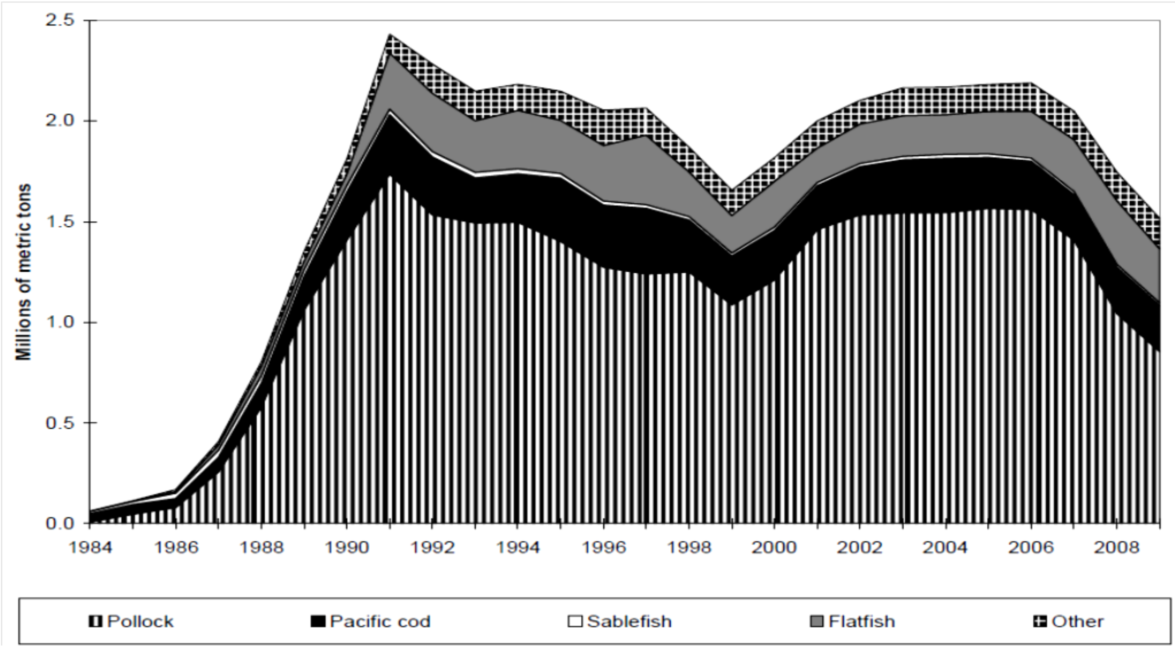


Figure 12. Groundfish catch in the domestic commercial fisheries off Alaska by species, 1984-2009.

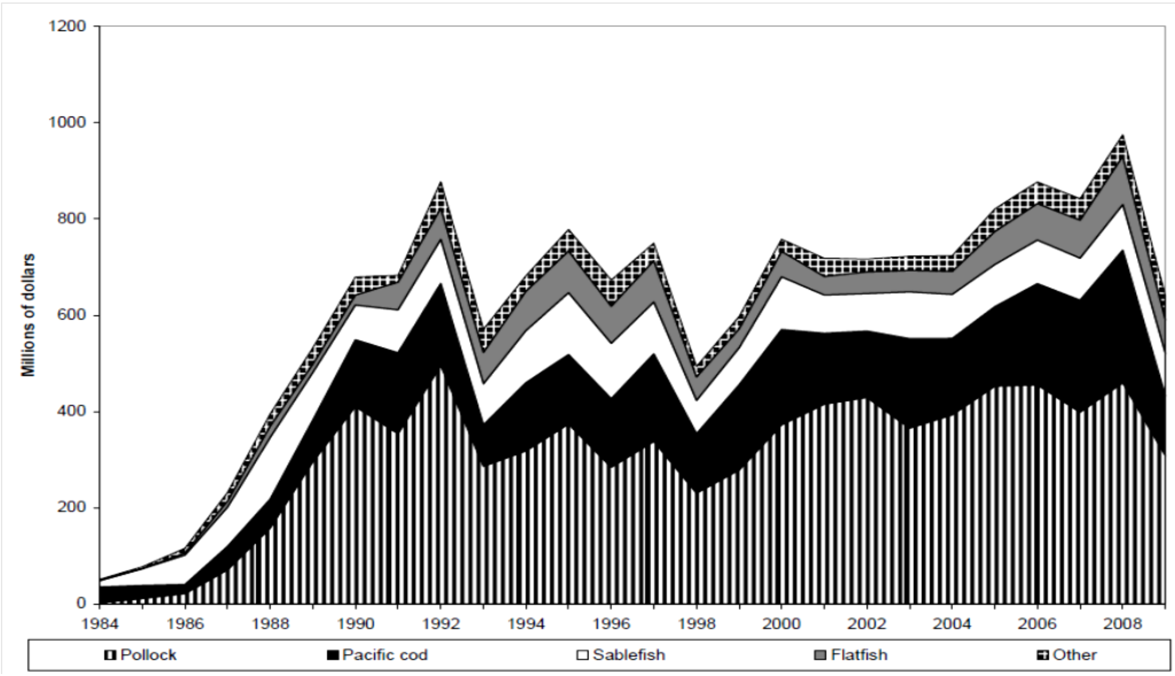


Figure 13. Real ex-vessel value of the groundfish catch in the domestic commercial fisheries off Alaska species, 1994-2009 (base year 2009). Estimates include federal and state fisheries of Alaska.

http://www.afsc.noaa.gov/REFM/docs/2010/economic.pdf

4. Proposed Units of Assessment

The proposed *Units of Assessment* submitted at the time of Application were reviewed with respect to their appropriateness for undertaking a full assessment. The assessors have reviewed the proposed units of assessment with respect to the application of management functions across all jurisdictions and an examination of the characteristics of each of the management regions to assess the similarities and potential differences during a full assessment of the Alaska pollock fisheries.

The proposed Units of Assessment within the Unit of Certification are listed below.

Unit of Certification			
U.S. ALASKA POLLOCK COMMERCIAL FISHERIES			
Fish Species (Common & Scientific Name)	**Geographical Location of Fishery**	**Gear Type**	**Principal Management Authority**
Walleye pollock (*Theragra chalcogramma)*	Gulf of Alaska and Bering Sea & Aleutian Islands	Pelagic trawl Gears (bottom trawl, jig, longline, pot) from other non-directed pollock fisheries legally landing pollock	National Marine Fisheries Service (NMFS) North Pacific Fishery Management Council (NPFMC) Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)

5. Site Meetings

5. 1. Initial Consultation Meetings

The objectives of the initial consultation meetings were to support information gathering and understanding of the role, functions and activities of the fishery management organizations responsible for US Alaska Pollock resources and to further investigate the approach that a full assessment might undertake with respect to the Unit of Certification and the Assessment Units that are proposed.

Consultation meetings were planned based on an initial review identifying the key management organizations and participants. The initial consultation meetings were not designed to be inclusive of all organizations and representatives of the Alaska pollock fisheries. However, the consultation plan was designed to strategically capture sufficient information to ensure understanding and confidence with respect to validation reporting.

There were other important functions that the on-site consultation also served. These included:

- The provision of an overview of the FAO-based assessment and certification process to management organizations and fishery representative organizations,

- Responding to any questions and comments raised at this initial stage in the assessment. An overview of the key criteria of the FAO Code of Conduct for Responsible Fisheries, and minimum substantive requirements for eco-labelling of fisheries (FAO Guidelines for the Eco-labelling of Fisheries and Fishery Products) was presented.

A summary of items included in the standard approach to each meeting were as follows:

- Introduction to the Certifying Body
- Overview and confirmation of the assessment plan with a standard power point presentation was used which was also made available on ASMI website for all participants to review
- General discussion on the specifics of the particular meeting:
    - Units of Certification and Units of Assessment
    - Initial site visit objectives and investigative approach
    - Address any immediate questions raised by management and participatory organizations
    - Document information that would form part of the full assessment

All consultation meetings were conducted by Dave Garforth, Lead Assessor, and Stephen Grabacki, contracted Fishery Assessor. Randy Rice, ASMI Seafood Technical Program Director was also present at some meetings as representative of the fishery applicant representative organization.

Overview of Meeting Plan:

Meetings were held between the 28st June to 2nd July 2010, in Juneau, Alaska and in Seattle, Washington.

Summary of Consultation Meetings:

Each meeting served as the primary purpose to introduce the Certification Body, Global Trust, and provide an overview of the FAO assessment approach and process. Key timelines for assessments and the specifics of the proposed assessment and certification units were presented. Immediate questions and concerns expressed by management and participatory organizations were addressed and some key areas which will form part of the full assessment were also addressed. Consultation meetings are intended to provide a briefing of the certification process and link to management organizations for the purposes of carrying out the fishery assessments and to support the next step in the assessment, the planning of full assessments for the fisheries in application.

The following summary Table 13 provides the background to each organization met, and a description of the specific key items discussed.

Table 13: Summary of Consultation Meetings

Date	Organization	Staff Represented	Overview/Key Items
28th June 2010	United Fishermen of Alaska, 211 4TH St. Suite 110 Juneau AK 99801-1172 (meeting took place at ASMI Juneau office)	Mark Vinsel, Executive Director	United Fishermen of Alaska (UFA) is an umbrella association representing 37 Alaska commercial fishing organizations from fisheries throughout Alaska and its offshore waters. Their mission is to promote and protect the common interest of Alaska's commercial fishing industry, as a vital component of Alaska's social and economic well-being. Core functions include; providing a legislative presence for members, act as a forum for communication within the fishing industry, maintain a state wide trade organization with staffed office and provide Public relations and educational programs on behalf of members.
27th June 2010	At-sea Processors Assn. 217, 2nd St. #201A Juneau AK 99801	Stephanie Madsen, Executive Director	The At-sea Processors Association (APA) is a trade association representing five companies that own and operate 19 U.S.-flag catcher/processor vessels that participate principally in the Alaska pollock fishery and west coast (USA) Pacific whiting fishery. Members include; American Seafood Company, Arctic Storm Management Group, Glacier Fish Co, Starbound LLC and Trident Seafoods. APA is directly involved in Alaska Pollock fishing. In addition members may operate across a range of species and fisheries, including Alaska Pollock processing.
28th June 2010	Alaska Department of Public Safety, Division of Alaska Wildlife Troopers, 2760 Sherwood Lane, Suite 1A PO Box 111201, Juneau AK 99811-1201	Lt. Steven Hall	Alaska Wildlife Troopers (AWT) is a Division of Alaska Department of Public Safety with responsibility for the protection of Alaska fisheries within State waters. The Division's resources and strategy for monitoring fishery activity and enforcement purposes and interaction with other agencies (ADFG, NMFS, US Coast Guard, Board of Fisheries) were discussed.

28th June 2010	U.S. Department of Commerce, National Oceanic & Atmospheric Administration, National Marine Fisheries Service, Alaska Region PO Box 21668; 709 W 9th St Juneau AK. 99802-1668	Robert ("Doug") Mecum, Deputy Regional Administrator, Alaska Region	NOAA National Marine Fisheries Service (NMFS, also called NOAA Fisheries) is responsible for the management, conservation, and protection of living marine resources within the U.S. Exclusive Economic Zone. The Alaska Region of NOAA Fisheries oversees fisheries that produce about half the fish caught in US waters, with responsibilities covering 842,000 square nautical miles off Alaska. NMFS works with the fishery management councils and commissions to develop and implement management regulations and also for the conservation of wildlife such as marine mammals and habitat conservation. The meeting provided an opportunity to discuss the assessment approach and outline the various steps in the assessment process.
28th June 2010	Alaska Department of Fish and Game, Division of Commercial Fisheries PO Box 115526 1255 W 8th St. Juneau AK 99811-5526	Eric Volk, Chief of Research for Anadromous Fisheries Sue Aspelund, Deputy Director Denby Lloyd, Commissioner (present for introductions)	ADFG's mission is to protect, maintain, and improve the fish, game, and aquatic plant resources of the state, and manage their use and development in the best interest of the economy and the well-being of the people of the state, consistent with the sustained yield principle. They manage the pollock state fisheries of which the principal is the Prince William Sound one, which although extremely small compared to the federal fishery, still requires significant effort in terms of scientific research, management and enforcement. Their main role is to conserve and develop the fishery resources of the state. This involves setting seasons, catch limits, management 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 meeting provided an opportunity to present the key features of the assessment process, discuss the broad mission and responsibility of ADFG.
29th June 2010	U.S. Department of Homeland Security, Coast Guard, District 17	Cpt. Michael Cerne	The United States Coast Guard is a military, multi-mission, maritime service within the Department of Homeland Security. Its core roles are to protect the public, the environment, and U.S. economic and security interests in any maritime region in which those interests may be at risk, including international waters and America's coasts, ports, and inland waterways.

	P.O Box 25517, Juneau, AK 99802-5517		Protect America's maritime borders from all intrusions by: preventing illegal fishing; and suppressing violations of federal law in the maritime arena. The US Coast Guard is responsible for fishery law enforcement beyond the 3 mile zone. Operations are combined with both State and other federal resources. The US Coast Guard shares intelligence and seacraft (often include AWT staff) with the other agencies involved in MCS (Monitoring, Control and Surveillance), including, NMFS and ADFG. Duties include Alaska Pollock fishery regulations enforcement. US Coast Guard also attends the fishery conferences and meetings of the principal management agencies, NPFMC where understanding and contribution through advice on the practical implementation of management proposals and regulations can be transferred to support effective enforcement-based activities. During the visit, attendance at the daily, morning briefing for staff and a visit to the surveillance control center also took place, discussions on US Coast Guard responsibilities for the 5 year strategic fishery plan and resources for monitoring, control and enforcement for all Alaska state fisheries including Alaska Pollock fisheries.
29th June 2010	United Fishermen 211 4th St. Ste 110 Juneau AK 99801	Arni Thomson, President of UFA,	UFA's mission is to promote and protect the common interest of Alaska's commercial fishing industry, as a vital component of Alaska's social and economic well-being. Core functions include; providing a legislative presence for members, act as a forum for communication within the fishing industry, maintain a state wide trade organization with staffed office and provide Public relations and educational programs on behalf of members.
2nd July 2010	U.S. Department of Commerce, National Oceanic & Atmospheric Administration, National Marine Fisheries Service, Alaska Fishery Science	Dr. Bill Karp, Deputy Director for Science and Research	The Alaska Fisheries Science Center is the research branch of the National Oceanic and Atmospheric Administration's National Marine Fisheries Service responsible for research on living marine resources in the coastal oceans off Alaska and off parts of the west coast of the United States. The mission of the Alaska Fisheries Science Center is to generate the scientific information and analysis necessary for the conservation, management, and utilization of the region's living marine resources. The Center provides scientific data and analysis and technical advice to the NMFS Alaska Regional Office, North Pacific Fishery Management Council, Alaskan coastal subsistence communities, and U.S. representatives participating in international fishery and marine mammal negotiations and to the fishing

	Center, 7600 Sand Point Way NE. Seattle WA. 98115		industry and its constituents. The Center also coordinates fisheries habitat and marine mammal research, with other Federal and state agencies, academic institutions, and foreign nations. Among other items, fishery stock surveys and assessments, observer programs, and Stock Assessment and Fishery Evaluation (SAFE) reports are routinely produced.
2nd July 2010	Trident Seafoods Corp. 5303 Shilshole Ave NW Seattle, WA 98107-4000	Joe Logan, Corporate QA	Trident Seafoods is a vertically integrated harvester, processor and marketer of seafood from Alaska, the Pacific Northwest and around the world. Founded in 1973, they are a privately held, American owned corporation operating offshore processors and shore-side plants throughout Alaska and the Pacific Northwest. The Trident trawl catcher processor fleet is comprised of 3 vessels ranging in size from 270 to 300 ft. These vessels operate in the Bering Sea, Aleutian Islands, Washington and Oregon with the majority of the harvesting operations taking place in the Bering Sea with the primary target species for these vessels being Pollock and flatfish which are targeted in the spring and fall. Discussions centered upon assessment approach and requirements for both fisheries and supply chains (Chain of Custody).
2nd July 2010	Pacific Seafood Processors Assn 199 W. Emerson Place Suite 205 Seattle WA 98119	Glenn Reed, President	PSPA is a non-profit trade organization established in 1914 to address issues of concern to member seafood companies including both at sea processors and shore based processors. Current Corporate members include: Alaska General Seafoods, Alyeska Seafoods, Inc., Golden Alaska Seafoods, LLC, North Pacific Seafoods, Inc., Peter Pan Seafoods, Inc., Phoenix Processor Limited Partnership, Trident Seafoods, Inc. and UniSea Inc., Westward Seafoods, Inc. PSPA members produce and market products from salmon, crab, halibut, cod, pollock and a variety of other seafood species. These products are marketed domestically and around the globe. Key points of discussion focused on the assessment approach, the definition of non conformances and the merits of eco-labelling in the supply chain.

5.2. On-Site Witnessed Assessment and Consultation Meetings

On-site visits took place in August 2011. These were additional visits to the initial consultation meetings reported in the previous section. There are two types of on-site assessment activities; meetings with fishery management organizations to discuss various aspects of the assessment and witnessed assessment, which takes the form of witnessing specific management processes and functions, such as publically accessible Council meetings where possible.

The schedule of on-site activities is provided in **Table 13.1 below** with a summary of the activity, meeting and discussion. Meetings were used to document information that either confirmed, clarified or substantiated aspects of the assessment and provided an opportunity for organizations to contribute information to support the assessment.

Table 13.1. Summary of onsite meetings for Alaska pollock, August 2011.

Date	**Organization/Attendance**	**Summary of Meeting**
Aug 15th	ASMI Client Meeting Randy Rice, Technical Director	ASMI is the Client representative on behalf of Alaska Pollock fisheries. ASMI is a public-private partnership between the State of Alaska and the Alaska seafood industry. ASMI's remit is to represent the entirety of Alaska's seafood interests through trade, promotional and marketing activities that foster economic development. Through Statute, ASMI has established that if successful, access to certification will be provided for all Alaska Pollock fishery interests with legal entitlement to harvest from the identified fisheries. ASMI's main roles, functions, fishery historical development and key fishery statistics were discussed.
Aug 15th	National Marine Fisheries Service (NMFS), Alaska Fisheries Science Center (AFSC) Visit; Sand Point Way. Bill Karp; Deputy Director for Science and Research James Ianelli, Bering Sea Stock Assessment Martin Dorn, Gulf of Alaska Stock Assessment	The meeting focused upon the role of NMFS in Alaska Pollock fishery science: Stock survey and assessment; methods; species biology, stock status, application of precautionary approach; fishery dependent information/observation; scientific advice to management, fishery ecosystem interactions and concerns. The meeting included both main assessment units under investigation; Bering Sea & Aleutian Islands and Gulf of Alaska fisheries. (The State managed Alaska Pollock fisheries were reviewed at the ADFG meeting later in the week). Arising out of discussion, a number of questions/clarifications were also noted by the team. AFSC confirmed and provided references for information available in current publications from NMFS (SAFE Reports) and from the NPFMC FMP's, and through follow-up requests to AFSC which may be required.
Aug 15th	Pacific Seafood Processors Assn. (PSPA) Glenn Reid ; President & Genuine Alaska Pollock Producers (GAPP); Pat Shanahan, Program Director	PSPA is a representative trade association of seafood organizations operating in Alaska and Washington. Their role is to foster public understanding of the importance of the seafood industry and has been in existence since 1941. GAPP is a dedicated marketing organization of once-frozen pollock products, harvested and processed in Alaska. A non-profit Alaska corporation formed in 2003, GAPP promotes Alaska Pollock in major whitefish markets around the world, with a focus on Europe, North America and Japan. The meeting focused on the role of PSPA's role and commitment to the responsible management and long term health of fishery resources (including Alaska Pollock) and protection of the marine environment upon which those resources depend. Key items included the participation of each

		organization in the management processes such as NPFMC meetings and various fishery science forums. Discussion included the history of the Alaska Pollock fisheries in Alaska, technical conservation activities undertaken in the design characteristics of Alaska Pollock mid-water trawls at avoiding Chinook and chum salmon capture and the observer program for Alaska Pollock.
Aug 16th	National Marine Fisheries Service (NMFS); Alaska Fisheries Region, 709 W 9th St. Juneau, AK. Mary Furness, Glenn Merill	NMFS is the principal management authority for federal fisheries within the US EEZ. The meeting initially focused upon the overall Federal management framework for Alaska Pollock and the history of Americanization (American Fisheries Act); key regulations of the Pollock fishery and management strategy were discussed, the harvest control rules and measures; seasons, closed areas, reporting of catches, catch inspection, monitoring and control.
Aug 16th	US Department of Homeland Security, Coast Guard, District 17 Lieutenant Anthony Kenne	Key items: Role of US Coast Guard in fishery management, monitoring, control and enforcement and at sea and ashore monitoring and control resources; administrative procedures, intelligence gathering and sharing among the enforcement agencies at State and Federal level and also International cooperation across shared, protected zones (Donut Hole). Key outcomes included; a synopsis of the administrative system for enforcement, an overview of the deployment of enforcement resources in the BSAI and GOA Alaska Pollock fisheries and confirmation of a high level of compliance to the regulations. Lieut. Kenne noted that further information would be provided on request.
Aug 17th	Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau Office Sue Aspelund, Deputy Director Stephanie Moreland- Federal Fisheries Coordinator	ADFG is the State Agency responsible for the management and utilization of State fisheries within Alaska. Their State managed fishery for Pollock is the Prince William Sound fishery. Nonetheless, parallel fisheries occur in state waters. Discussion focused upon on the survey of the main State fisheries and on the connectivity of the State and management systems (BoF/NPFMC/NMFS). Key discussion and information gathered included the locations and assessment approach for Alaska Pollock fisheries, gear definitions in operation and effort management, fish harvest reporting (fish tickets), monitoring and control among the various agencies at State (AWT) and federal level (NMFS).
Aug 17th	ASMI Client Visit, Juneau Office (Admiral Ray Riutta, Executive Director). United Fishermen of Alaska	A second meeting was held with ASMI, the client representative body at their Juneau headquarters. In addition, ASMI members associations (United Fishermen of Alaska (UFA) represented by Mark Vinsel, Executive Director and At-Sea- Processors Assn. (ASPA) represented by Stephanie Madsen, Executive Director) attended the meeting. The discussion focused on advising

	(UFA) (Mark Vinsel, Executive Director At-Sea- Processors Assn. (ASPA)(Stephanie Madsen, Executive Director	members of the assessment process and a briefing of meetings and progress at that point. Key areas of assessment were discussed to ascertain the role of these associations in the promotion of responsible fishing practices within Alaska Pollock fisheries. The client representative organizations provided an overview of their representation and their role within the administrative processes that manage Alaska Pollock fisheries.
Aug 18th	North Pacific Fisheries Management Council (NPFMC), Anchorage Chris Oliver, Executive Director Jane DiCosimo, Senior Plan Coordinator (attendance by conference) David Witherell, Deputy Director Diana Stram, Plan Coordinator	The North Pacific Fishery Management Council (Council), was created by Section 302(a)(7) of the Magnuson-Stevens Fishery. A guide to the NPFMC organization and decision making processes is available at http://www.fakr.noaa.gov/npfmc/misc_pub/Navigating_NPFMC.pdf. Organization, practices and procedures of the Council are also documented. http://www.fakr.noaa.gov/npfmc/misc_pub/sopp608.pdf The Council meeting process consists of three major meetings. The Scientific and Statistical Committee (SSC) and the Advisory Panel (AP) provide recommendations to the Council. The SSC is made up of scientists and economists, and the AP's membership covers a variety of fishing industry sectors as well as conservation groups. Representatives on the SSC, Council, and AP are from Oregon, Washington, and Alaska. The public can comment in each meeting. Recommendations of the Plan Teams with respect to Allowable Biological Catch (ABC/s), Total Allowable Catch (TAC/s) etc. are vetted by the SSC. The SSC recommendations are reviewed by the AP. At this stage in a proposal process, resource users and interested parties can comment on the recommendations. The recommendations proposed through the SSC and AP are read at the Council’s plenary sessions who make the final decision on recommendations. The Council reports the decision on recommendations to the Secretary of Commerce who has ultimate authority, although decisions are virtually never disapproved. Plan Teams and the SSCs are tasked with conservation decisions which take place without input from users in order that conservation is maintained separate from allocation issues. The AP and NPFMC make allocation and management decisions based on these conservation decisions. Key features of the meeting included precautionary management and total caps on harvesting in the BSAI and GOA, Stella Sea lion status, Chinook and chum by-catch measure developments, review process (CIE), observer programs. The Council staff provided direction to sources of information and papers and also confirmed that clarification would be provided on request from the Assessment Team, as necessary.

6. Assessment Outcome Summary

This section provides a summary of the outcome of evidence that has been evaluated by the Assessment Team for the conformance of US Alaska pollock fisheries to the FAO-Based RFM Conformance Criteria. The summary information is presented for each of the fundamental clauses (1 to 14) that form the FAO-Based RFM Conformance Criteria. These are divided into the 6 key components of responsible fisheries management (A-F).

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**

Section 7 documents the more detailed outcomes of the evidence that has been reviewed, evaluated and presented for each of the individual supporting clauses of the FAO-Based Conformance Criteria. Please note that the evidence provided for some clauses may be repetitious due to the overlapping nature of the FAO-Based Conformance Criteria clauses and relative requirements.

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.

The primary layer of governance for the Alaska pollock fisheries is dictated by the MSA. The main agencies involved in pollock management within Alaska's EEZ (NMFS, NPFMC), and all of their activities and decisions, are subject to the MSA. The MSA sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all Fishery Management Plan (FMP) must be consistent. The GOA Groundfish FMP and the BSAI Groundfish FMP govern the management of the federal pollock fisheries. In federal waters (3-200 nm), Alaska Pollock fisheries are managed by the NPFMC and the NMFS Alaska Region. With jurisdiction over the million square mile EEZ off Alaska, the NPFMC has primary responsibility for groundfish management in the GOA and BSAI, including cod, pollock, flatfish, mackerel, sablefish, and rockfish species harvested mainly by trawlers, hook and line longliners and pot fishermen. The Council submit their recommendations and plans to the NMFS for review, approval, and implementation. In addition, NMFS Alaska Regional Office conducts biological studies, stock survey and stock assessment reports. The USCG is responsible for enforcing these FMPs at sea, in conjunction with NMFS enforcement ashore. In addition to this, the USCG enforce laws to protect marine mammals and endangered species, international fisheries agreements (i.e. UN High Seas Driftnet Moratorium in the North Pacific), and foreign encroachment in U.S. EEZ.

In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF. Biomass is estimated by bottom trawl surveys in summer and hydroacoustic surveys in winter. In 1999 the BOF directed the ADFG to establish 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 for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. The effort in the patrol and enforcement of state waters regulations is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT).

The biological unity and other biological characteristics of the stock are considered within the management system. The Pollock fishery is apportioned between spawning and pre-spawning seasons in the Bering Sea; and in four seasons in the Gulf of Alaska.

In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes and are managed within the framework of the BSAI Groundfish FMP. These are: pollock occurring on the Eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; the Aleutian Islands Region encompassing the Aleutian Islands shelf region from 170W to the U.S.-Russia Convention line; and the Central Bering Sea Bogoslof Island pollock. Pollock in the Gulf of Alaska, specifically, the spawning aggregations in PWS, the Shelikof Strait and the Shumagin Islands are managed within the framework of the GOA Groundfish FMP.

Within the Eastern Bering Sea, pollock occur largely within Alaska's EEZ, but there is some apparent migration of pollock to the northwest which can result in varying amounts of Eastern Bering Sea shelf pollock found in the Cape Navarin area of Russia. For the latest published report, in 2009, the Alaska EEZ contained more than 99% of the pollock stock. These surveys into the Russian Area are largely carried out by the U.S. (Russia completed a part in 2002). Stock assessments used for U.S. management (setting the upper limit of the TAC) have considered this migration and possible removals using sensitivity analyses, largely treating the Russian zone component as additional mortality.

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 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 Exclusive Economic Zones (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. These meetings have resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea.

Alaska pollock are also found in international waters where no country has sole jurisdiction. 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.

All fishery removals and mortality of the target stock(s) are considered by management. For both the BSAI and the GOA pollock stocks (see EBS and GOA pollock Stock Assessment and Fishery Evaluation (SAFE) reports), the management organizations collect the necessary information on removals and mortality (including natural mortality) of the target stock, as well as data on bycatch and discards. Strictly enforced landing reports, at sea and shore-based fishery enforcement, fishery observers and an extensive mandatory and voluntary logbook program verify and ground-truth total mortality estimates.

NPFMC's management arrangements and decision making processes for the fishery are organized in a very transparent manner. The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites, including agenda of meetings, discussion papers, 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.

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.**

The NMFS and the NPFMC 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. Every agency in the executive branch of the Federal Government has a responsibility to implement NEPA. In NEPA, Congress directed that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered 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 processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. When a company applies for a permit (for example, for crossing federal lands or impacting waters of the United States) the agency that is being asked to issue the permit must evaluate the environmental effects of the permit decision under NEPA. Each NPFMC fisheries package (amendments and developments) must go through the NEPA process.

All the fishery agencies 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 meetings or the BOF meetings in the case of ADFG. In terms of conflict avoidance and resolution between different fisheries, the NPFMC and the BOF tend to avoid conflict by actively involving stakeholders in the process leading up to decision making. The NPFMC and the BOF also have a standing joint committee that meets to resolve management and allocation issues. 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 all their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for resolution of potential fisheries conflicts. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register.

The primary job of the NPFMC and the BOF is allocation of resources to different users. To do so, they use biological and socio-economic information collected and analyzed by the NMFS and the ADFG. The NPFMC, NMFS and ADFG all have staff economists that participate in the economic, social and cultural evaluation and review process of fishery management proposals. They advise and report the NPFMC and BOF members, as well as their agency heads who help lead the regulation amendment process. On a higher level, the NEPA process has similar requirements - the biological and socio-economic aspects of the fishery must be taken into account before any decision can occur.

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

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

Under the MSA, the NPFMC 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 FMPs for pollock fisheries in the GOA and the BSAI. Both FMPs present long-term management objectives for the Alaska pollock fishery. The MSA, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. Under the direction of the NPFMC, the GOA and BSAI FMPs define nine management and policy objectives that are reviewed annually. They are: Prevent Overfishing, Promote Sustainable Fisheries and Communities, Preserve Food Webs, Manage Incidental Catch and Reduce Bycatch and Waste, Avoid Impacts to Seabirds and Marine Mammals, Reduce and Avoid Impacts to Habitat, Promote Equitable and Efficient Use of Fishery Resources, Increase Alaska Native Consultation, Improve Data Quality, Monitoring and Enforcement.

The economic conditions of the Alaskan commercial pollock fisheries promote responsible fisheries. The Alaskan pollock fishery is a very tightly managed fishery and also a fishery that has largely remained stable and economic since the early 1990s.

The Sustainable Fisheries Act (SFA) substantially amended the MSA in 1996. Among other things, the SFA placed increased emphasis on ending overfishing and rebuilding overfished stocks. The SFA also added three new national standards to the seven existing standards in the MSA to focus attention on specific areas of concern – impacts of management actions on fishing communities, bycatch reduction, and safety at sea. The SFA required that FMPs be amended within two years to incorporate the new changes. In addition, the SFA requires that a report to Congress on the status of stocks be prepared each year.

Until 1998, the Bering Sea directed pollock fishery had been a managed open access fishery, commonly characterized as a "race for fish." In 1998, however, Congress enacted the American Fisheries Act (AFA) to rationalize the fishery by limiting participation and allocating specific percentages of the Bering Sea directed pollock fishery TAC among the competing sectors of the fishery. After first deducting 10 percent of the TAC for the Community Development Quota (CDQ) Program and an incidental catch allowance, the AFA allocates 50 percent of the remaining TAC to the inshore catcher vessels sector; 40 percent to the catcher processor sector; and 10 percent to the mothership sector.

In the GOA, in 1996, a moratorium on entry of new vessels into the groundfish fishery was implemented. The large number of vessels fishing for a limited resource had created a "race for fish," characterized by short seasons and economic inefficiency. The intent of the moratorium was to prevent these problems from worsening while comprehensive solutions were being developed. In June 1995, the Council adopted a license limitation program (LLP) to supersede the vessel moratorium. As of January 1, 2000 a Federal LLP license is required for vessels participating in directed fishing for LLP groundfish species in the GOA or BSAI, or fishing in any BSAI LLP crab fisheries. The LLP license requirement is in addition to all other permits or licenses required by federal regulations. The Restricted Access Management (RAM) Program has prepared lists of License Limitation Program (LLP) groundfish and crab licenses. LLP licenses are initially issued to persons, based on the activities of original qualifying vessels.

Fishermen participating in state waters must hold approved entry permits (commercial fishing licenses/gear cards), and fish from licensed vessels. Licenses must be renewed annually with the Commercial Fisheries Entry Commission (CFEC) and comply with all state landing and reporting requirements. For the PWS State pollock fishery "5 AAC 28.263 Prince William Sound Pollock Pelagic Trawl Management Plan" sets the regulation for the directed state pollock fishery. Originally, in the pollock state fishery of 2000, the BOF established an emergency regulation which established the PWS management plan, primarily as a means to increase protection of endangered Stellar Sea lions. The plan, subsequently adopted by the BOF, provided for the directed fishery to be apportioned among three sections of the inside district (-1 Bainbridge Section, -2 Knight Island Section, and -3 Hinchinbrook Section), with no more than 40% of the guideline harvest level taken in any one section. The same management plan, established that during a directed pollock pelagic trawl fishery, the total bycatch weight of all species combined may not exceed five percent of the total round weight of the pollock harvested.

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. Also, the CDQ Program, worth 10% of the BSAI pollock TAC allowance, addresses the fishery dependence of coastal and western Alaska communities and 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 coastal communities to participate in the regional commercial fisheries, or residents themselves have fished the CDQ. 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 by using Prohibited Species Catch (PSC) limits and by virtue of other programs (i.e. Rolling Hotspot). The NPFMC and the industry alike are taking drastic measures to reduce non - Chinook and Chinook salmon bycatch (critically important for subsistence and small scale fisherman in Alaska) in the pollock fisheries.

The Groundfish FMPs for the GOA and the BSAI essentially set regulations for the sustainable exploitation of the groundfish resources of which pollock is the single most abundant species. In addition to this, the species bycaught in each of these fisheries making up the groundfish complex are taken into account and managed accordingly in one form or another (i.e. PSC limits, Maximum Retainable Allowance, etc..). This framework is therefore concerned with the overall conservation of biodiversity of aquatic habitats and ecosystems in the GOA and BSAI. In addition to this, the

Endangered Species Act (ESA) sets forward a framework to conserve threatened and endangered species and their ecosystems. Two federal agencies, the NMFS and the U.S. Fish and Wildlife Service (USFWS), are responsible for maintaining lists of species that meet the definition of threatened or endangered under the ESA. NMFS is responsible for maintaining the endangered species list for marine species and managing those species once they are listed. The USFWS is responsible for maintaining the endangered species list for terrestrial and freshwater species and managing those species once they are listed.

B. Science and Stock Assessment Activities

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

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.

Prior to the domestication of the pollock fishery, the catch was monitored by placing observers on foreign vessels. Since 1988, only U.S. vessels have been operating in this fishery and by 1991, the current NMFS observer program for north Pacific groundfish fisheries was in place. Landings have been recorded by a combination of ADFG fish tickets and more recently the electronic eLandings system. Landings are verified by shorebased observers. Estimates of discards are compiled from fishing logbooks and at-sea observer data. The age composition of the catches has been estimated annually from 1979 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions.

In the EBS two fishery-independent research surveys have been used to estimate trends in the population abundance, size and age composition. A bottom trawl survey has been conducted in the EBS annually since 1979. This survey gives an estimate of the near-bottom component of the population defined by the fraction of the population within the depth range sampled by the bottom trawl. This population component tends to be older than the off-bottom component. An acoustic-Trawl (AT) survey has also been conducted to estimate the off-bottom component of the population. The frequency of the survey has increased over the period 1979-2010 from initially every 3 years to annually in recent years (see table above). The acoustic survey tends to catch younger fish than the trawl survey because of the distribution of age groups in the water column, and the combination of the two surveys gives a more complete coverage of the age distribution of the population.

GOA catch is currently estimated by the NMFS regional office from landing records and observer estimates of discards. Catch estimates include the state managed fishery in PWS. The age composition of the GOA catches has been estimated annually from 1976 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions.

Three fishery-independent research surveys are conducted to estimate population abundance and age composition. A bottom trawl survey has been conducted by the AFSC every three years (beginning in 1984) to assess the abundance of groundfish in the Gulf of Alaska. Starting in 2001, the survey frequency was increased to every two years. Echo integration trawl (EIT) surveys have been conducted annually since 1981 (except 1982 and 1999) to assess the biomass and age composition of pollock in the Shelikof Strait area. The ADFG has conducted bottom trawl surveys of nearshore areas of the Gulf of Alaska since 1987. In addition, estimates of spawning biomass in Shelikof Strait based on egg production methods were available for 1981, 1985-1992. Results from a number of historical trawl surveys conducted during 1961-1982 were also available.

The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys in winter.

The *Stock Assessment and Fishery Evaluation* (SAFE) report is compiled annually by the BSAI and GOA Groundfish Plan teams, which are appointed by the Council. The sections are authored by AFSC and State of Alaska scientists. The SAFE reports include a volume assessing the *Economic Status of the Groundfish Fisheries off Alaska* as well as a volume on *Ecosystem Considerations*. 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.

The pollock fishery in the BS is conducted entirely by AFA vessels over 60 feet in length. Almost all of these vessels carry at least 1 observer 100% of the time as required by 679.50. The only exception is catcher vessels that deliver unsorted codends to other vessels for processing. In these cases, the catches are examined by observers on the receiving vessels. Between 2004 and 2007 87% of the BS pollock directed catch was taken by vessels with observers onboard and the remaining catch was examined by observers on vessels that received unsorted catch.

The GOA pollock fishery is conducted entirely by catcher vessels under 125 feet in length. Only the vessels over 60 feet are required to carry observers and only 30% of their fishing effort is observed. Vessels under 60 feet in length, accounting for approximately 30% of the fishing weeks in the GOA, are not required to carry observers. However, these vessels do not sort their catch onboard for safety reasons. Instead, the catches are either pumped directly to other carriers or placed directly into the catcher vessel hold. The catches are then examined when landed at shoreside plants where there is 100% observer coverage. Between 2004 and 2007 31% of the GOA pollock directed catch was taken by vessels with observers onboard.

The NPFMC and NMFS are undertaking a review of the observer program to address a number of operational concerns. Five restructuring options are being considered and each one includes an increase in coverage for vessels < 60 feet in length. Consultation on these options is ongoing. The new observer program should be up and running by the beginning of 2013.

The Economic and Social Sciences Research Program within NMFS's REFM provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Much of the existing economic data about Alaskan fisheries is collected and organized around different units of analysis, such as counties (boroughs), fishing firms, vessels, sectors, and gear groups.In addition, in 2005, the AFSC compiled baseline socioeconomic information about the 136 Alaska communities most involved in commercial fisheries. Communities were selected by assessing fishery-involvement indicators including landings, processors, vessel homeports, vessel ownership, crew licenses, and gear operator permits. The profiles compiled information from the US Census, ADFG, CFEC, NMFS Restricted Access Management Division, Alaska Department of Community and Economic Development, and various community groups, websites, and archives. This database is soon to be updated with 2010 data.

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.**

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). The mission of the AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence.

Scientists at the AFSC conduct research and stock assessments on pollock in Alaska each year. This includes data collection and analysis to support an ecosystem approach to management of Northeast Pacific and eastern Bering Sea fish and crab resources. More than twenty-five groundfish and crab stock assessments are developed annually and used by the NPFMC to set catch quotas. In addition, economic and ecosystem assessments are provided to the NPFMC on an annual basis. Division scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate.

Fishery information is available regarding trawl catcher and catcher/processor vessel fishing activities that target pollock in the BSAI and GOA. Records of catch and effort for these vessels are collected by observers and by vessel captains in voluntary and required logbooks. Fishery data from the Observer Program are available since 1990. Extensive at-sea and shorebased sampling programs allow the annual estimation of the size and age composition of the catch, an essential input to the stock assessment and associated research effort. Catch, effort, age, length, weight, and maturity data are collected during pollock trawl and acoustic surveys. These surveys provide an accurate index of pollock abundance, size, and age composition.

The AFSC operates the following laboratories and Divisions. The Auke Bay Laboratories conducts scientific research on fish stocks, fish habitats, and the chemistry of marine environments. Information from this research is widely used by commercial interests such as fishing industries, and governmental agencies involved in managing natural resources. The National Marine Mammal Laboratory conducts research on marine mammals, with particular attention to issues related to marine mammals off the coasts of Oregon, Washington and Alaska. Information is provided to various U.S. governmental and international organizations to assist in developing rational and appropriate management regimes for marine resources under NOAA's jurisdiction. 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 Division is responsible for training, briefing, debriefing and oversight of observers who collect catch data onboard fishing vessels and at onshore processing plants and for quality control/quality assurance of the data provided by these observers. 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. Data derived from these surveys are supplied to fishery managers and agencies and to the commercial fishing industry. The Resource Ecology and Fisheries Management Division (REFM) collects data to support management of Northeast Pacific and eastern Bering Sea fish and crab resources. Stock assessments are done annually and used to set catch quotas. Division scientists also evaluate how fish stocks and user groups might be affected by fishery management actions.

The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys in winter.

The *National Standard Guidelines for Fishery Management Plans* published by the NMFS require that a SAFE report be prepared and reviewed annually for each FMP. The SAFE report summarizes the best available scientific information concerning the past, present, and possible future condition of the stocks, marine ecosystems, and fisheries that are managed under Federal regulation. It provides information to the Councils for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. The SAFE reports are published annually in three sections: a “Stock Assessment” section, which comprises the bulk of this document, and “Economic Status of Groundfish Fisheries off Alaska” and “Ecosystem Considerations” sections, which are bound separately.

Since the late 1980’s, the Alaska pollock fishery has been conducted solely by US vessels and all the monitoring activities have been conducted by US research and management organizations. The US acoustic trawl survey has been designed to survey the entire population and thus crosses the international border. Permission to do this is obtained from the Ministry of Foreign Affairs of the Russian Federation.

The annual stock assessments are peer reviewed by experts and recommendations are made to improve the assessments through directed research. These recommendations are made by the assessment Plan teams, the SSC, and during periodic CIE reviews. The recommendations from previous meetings are highlighted in the introductions of the assessment SAFE documents and progress on recommended research is noted.

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 target. Remedial actions shall be available and taken where reference points or other suitable proxies are approached or exceeded.

National Standard 1 of the MSA, passed in 1976, required that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. 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 F_{OFL}, 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. New statutory requirements were established under the MSA in 2006 to end and prevent overfishing by the use of annual catch limits (ACL) and accountability measures. The measures were required to be implemented for all stocks subject to overfishing by 2010 and for the rest of the stocks by 2011.

The groundfish management plans for the BSAI and the GOA include harvest control rules designed to determine ACLs. The harvest control rule is designed to prevent overfishing by establishing a maximum fishing mortality threshold and using this to determine annual catch limits. The ABC is set below the OFL. The ACL cannot exceed the ABC, and may be divided into sector-ACLs. The 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 (i.e., uncertainty in the ability of managers to constrain catch so the ACL is not exceeded, and uncertainty in quantifying the true catch amount).

Stocks are assigned to 1 of 6 tiers depending on the level of knowledge about stock productivity and the ability to estimate specific biological reference points. The EBS pollock stock is in tier 1 where information is abundant enough and compelling enough to determine the statistical distribution of maximum sustainable yield. This requires a reliable stock-recruitment relationship whereby the number of age 1 fish (recruits) entering the populations may be predicted based on the biomass of spawning pollock. In this case, it is possible to estimate the probability distribution of the biomass at maximum sustainable yield (B_{MSY}) and a probability distribution of the fishing mortality associated with MSY (F_{MSY}). Stocks are assigned to tier 2 if there are only point estimates of these reference points. If there is not a reliable stock-recruitment relationship, but there is enough information to calculate a spawner per recruit function, the stocks are assigned to tier 3. In this case, a fishing mortality designation of the form "$F_{X\%}$" 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. The term $B_{40\%}$ refers to the long-term average biomass that would be expected under average recruitment and $F=F_{40\%}$. GOA pollock are assigned to tier 3. The suitability of the proxy reference points used in tier 3 has been the subject of considerable research. Tier 4 stocks are those for which per-recruit fishing mortality estimates can be made but for which there is not an adequate basis to estimate average recruitment. For tier 5 stocks, there is only knowledge of stock biomass and natural mortality. And, for tier 6 stocks there is only knowledge of historical catches.

EBS Pollock is a tier 1 stock and therefore the reference points are based on MSY. The advice from the previous assessment is compared to that from the most recent assessment. It was noted that the 2010 estimate of stock size was considerably higher than that made in 2009 because of higher than expected AT survey estimates in 2010 and the appearance of a strong 2008 year-class. The estimated total biomass in 2011 made in the 2009 assessment was 6,223,300 tons while it was 9,620,000 tons in 2010. There was a corresponding increase in the OFL for 2011 from 1,220,000 tons to 2,447,000 tons. Nonetheless, the SAFE report authors recommended an alternative F_{ABC} that would result in a more gradual increase in fishing mortality than the prescribed ABC, and based on the average fishing mortality on the recent average fishing mortality. The difference in forecast fishing mortality is $maxF_{ABC}$ = 0.564 and recommended F_{ABC} = 0.332. EBS pollock is well above target reference point, and it is neither overfished nor approaching overfished conditions.

GOA pollock is a tier 3 stock and therefore the reference points are based on spawner per recruit reference points (e.g. $B_{X\%}$ and $F_{X\%}$). The assessment results indicated that the current stock size was in the range between the limit and target level (moderately increasing), and that the fishing mortality used in the catch forecast should be reduced. The estimated 2011 OFL was 118,030 tons, the estimated ABC (following the prescribed tier 3 rule) was 102,940 tons. The SAFE report author recommended a slightly more conservative ABC rule that had a higher target biomass and this resulted in a recommended ABC of 88,620 tons. GOA pollock is considered neither overfished nor approaching overfished conditions.

Another limit of reference point used in managing groundfish in the BSAI and GOA is the optimum yield (OY). The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within a given range. The range for BSAI is 1.4 to 2.0 million mt; the range for GOA is 116 to 800 thousand mt. In practice, only the upper OY limit in the BSAI has been a factor in altering harvests. Because of high productivity, Acceptable Biological Catches (ABCs) in the BSAI have summed to well above 2.0 million metric tons for several years. Some people believe this OY limit has been the main reason that the fisheries in the BSAI have held up so well. The lower limits in both the BSAI and the GOA have never been approached in recent time, so they have not received recent attention.

In addition 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. However, this does not change the specification of ABC or OFL. The B20% also applies to the state PWS fishery.

The harvest control rule used for BSAI and GOA groundfish scales the level of fishing according to the status of the stock. The highest level of fishing ever permitted is that which will produce MSY, or its proxy. When the stock size declines below its target or BMSY, or its proxy, the level of fishing is reduced. When the stock size declines to below a critical level (20% unfished spawning biomass), fishing is ceased. The status of both the EBS and GOA pollock populations is monitored relative to this harvest control rule.

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.**

Beginning at the single species level, the groundfish management plans for the BSAI and GOA include all the elements of the PA. The plans have pre-defined harvest control rules that include limit and target reference points and are used to determine annual catch limits to control exploitation within sustainable bounds and to promote optimal utilisation around MSY. The harvest control rules include a variable harvest rate that is reduced if the stock falls below a target level of

B_{MSY}, or its proxy of $B_{40\%}$, in order to promote stock rebuilding. The harvest rate is controlled to be below a limit reference point of F_{OFL}. F_{OFL} is maintained at a constant level of F_{MSY}, or its proxy $F_{35\%}$ when the stock size is above the target, it is reduced if the stock size falls below the target, and is set to 0 if stock size falls below a critical level. The critical level may be adjusted upward if other considerations suggest a more conservative approach is warranted. This critical level has never been approached for EBS and GOA pollock over the history of management under the MSA. This single species approach is applied to all groundfish stocks in Alaska.

The advisory process for Alaskan pollock fisheries has measures built in to further enhance conservation. Stocks are assigned to 1 of 6 "tiers" that represent descending levels of knowledge about their ecology and fishing history. Management reference points differ among the tiers and become more conservative when knowledge is lacking.

The ABC is defined in such a way as to take into account uncertainty regarding the OFL estimation and other uncertainties in the stock assessments. The Plan teams have the option to propose alternatives (more conservative revision) to the ABC if conditions warrant, such as additional uncertainties, recruitment variability, and declining stock trends. The ABC is always lower than the OFL. The Council's Scientific and Statistical Committee then reviews the SAFE report and Plan Team recommendation, and makes its own recommendation to the Council. The Council then reviews the SAFE report, Plan Team recommendation, and SSC recommendation; then makes its own recommendation to the Secretary, with the constraint that the Council's recommended ABC cannot exceed the SSC's recommended ABC.

The next stage of the management process is to determine the annual total allowable catch (TAC) for each stock. The TAC must be lower than or equal to the ABC. The TAC may be lower than the ABC is warranted on the basis of bycatch considerations, management uncertainty, socioeconomic considerations, or if required to have the sum of all TACs for directed species in the ecosystem (BSAI and GOA separately) to fall within the range of the Optimum Yield (OY). In this way, the management system addresses multi-species, ecosystem, and social needs of the fishery.

In application, the NPFMC sets TAC ≤ ABC < OFL. Because of the complex array of accountability measures governing these fisheries, actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC.

NMFS uses Steller sea lion protection measures to ensure the groundfish fisheries off Alaska are not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify their critical habitat. The management measures disperse fishing over time and area to protect against potential competition for important Steller sea lion prey species near rookeries and important haulouts. Currently 54% of Steller sea lion critical habitat is closed to directed pollock fishing in the BSAI and GOA areas. Since 1992, the GOA pollock TAC has been apportioned spatially and temporally to reduce potential impacts on Steller sea lions. The details of the apportionment scheme have evolved over time, but the general objective is to allocate the TAC to management areas based on the distribution of surveyed biomass, and to establish three or four seasons between mid-January and autumn during which some fraction of the TAC can be taken. The Steller Sea Lion Protection Measures implemented in 2001 established four seasons 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. Allocations to management areas 610, 620 and 630 are based on the seasonal biomass distribution as estimated by groundfish surveys.

Additional management measures are also in place to reduce the bycatch of Pacific salmon (Chinook and Chum) in the pollock fisheries. Amendment 84 established in Federal regulations, the salmon bycatch intercooperative agreement (ICA), which allows vessels participating in the Bering Sea pollock fishery to use their internal cooperative structure to reduce Chinook and non-Chinook salmon bycatch using a method called the voluntary rolling hotspot system (VRHS). Through the VRHS, industry members provide each other real-time salmon bycatch information so that they can avoid areas of high Chinook or non-Chinook salmon bycatch rates. The VRHS was implemented voluntarily by the fleet in 2002 and was adopted by the NPFMC in 2005.

Pacific salmon are taken as bycatch in the GOA groundfish fisheries, in which they are considered prohibited. Although five species of salmon are caught in the fisheries, the Council has been concerned about Chinook salmon, as the species with the highest bycatch in recent years. Chinook salmon bycatch primarily occurs in trawl fisheries, in the central and western regulatory areas. Between 2003 and 2010, the pollock target fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily nonpelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder. In 2011, the Council approved Chinook salmon prohibited species catch (PSC) limits for the GOA pollock fisheries in the central and western regulatory areas. Once these annual limits are reached, the pollock fishery in the respective regulatory area will be closed. The Council is also considering other, comprehensive management measures to address Chinook salmon bycatch in the GOA trawl fisheries.

D. Management Measures

8. Management shall adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

The MSA is the managing federal legislation that defines how fisheries off the United States EEZ are to be managed. From this legislation and Council objectives, the management system for the NPFMC groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY (including the BSAI's two million metric tons groundfish complex exploitation cap), TAC, ABC, OFL—effort controls (ITQs, licenses, cooperatives), time and/or area closures (also known as habitat protection, marine reserves), by-catch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), monitoring and enforcement (observer program), social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL) and to avoid seabirds). The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information.

The MSA mandate for sustainability and achieving OY precludes destructive fishing practices. Federal regulations only provide one method of directed fishing for pollock, the pelagic trawl. There is no destructive fishing gear or methods that are allowed under federal regulations, off Alaska. Other methods of legally retaining pollock bycatch, are also regular fishing gear that are not considered destructive. For the PWS state fishery, the only allowed gear for direct targeting of pollock is pelagic trawl. Most of the remaining state water areas are fished under state of Alaska commercial fisheries regulations. 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 SSL restrictions, respectively, incorporating federal/Council regulations within state waters. In most cases, pollock can be retained as bycatch in these commercial fisheries.

For the pollock fishery, the Council has had to balance the needs of the large, offshore catcher processors and catcher boats that deliver to motherships, both of which catch and process at sea, and the shorebased catcher vessels that deliver shoreside. This allocation was extremely important to all of the pollock harvesters and processors; and became even more so as the fleets and processors exceeded capacity. With excess capacity, the mobile offshore catchers and processors could impact the shorebased pollock fleet and often leave them with fishing areas close to town that were locally depleted; particularly when roe stripping (the practice of stripping roe from female pollock and discarding all female carcasses and all male and juvenile pollock).

Wasteful, highly allocative (favoring CP & motherships over shore based plants & vessels) fisheries allocations led to the wasteful fishing practice of roe stripping by the offshore fleet, producing ecosystem concerns created by the large volume of carcasses discarded at sea. Because the pollock fleets were continuing to grow, harvests were occurring faster and faster each year in a race for fish; resulting in compressed seasons and a high potential to exceed TAC, thereby increasing the likelihood of reduced spawning potential. Because of the waste and ecological concerns the Council prohibited roe stripping. It further established a Council policy of full utilization such that the pollock harvest is to be used for human consumption to the maximum extent possible. It also divided the pollock TAC into two seasonal allowances: roe-bearing (“A” season) and non roe-bearing (“B” season). In the GOA the TAC was separated into four equal quarterly allowances. The percentage of the TAC allocated to each allowance is determined annually during the TAC specifications process. Over the next few years the Council allocated the TAC into an inshore and offshore allocation, and later Congress reduced capacity, set the final inshore/offshore allocation and provided fleets and processors the tools (Cooperatives and named vessels and plant participants) to economically address the pollock allocation and the industry’s impacts from the Steller sea lion regulations.

The proposed socio-economic changes were significant. Cooperative management of the pollock fishery represents a dramatic change from the open access fishery that preceded it. The various iterations of regulations prohibiting roe stripping, Inshore/Offshore I, II and III, and the Council implementation of the federal AFA legislation consumed hundreds of hours of analytical evaluation, state/federal/national meetings and court challenges. The multiple Council analysis were NEPA compliant, meaning that they evaluated the full array of impacts, seeking out affected parties and providing 10’s of hours at most Council meetings to take written and oral testimony from individuals and organizations representing the various stakeholders. Members of the BSAI pollock fishing community have stated that the AFA has allowed them to improve their fishing practices and operate their businesses in a more rational manner. Reduced bycatch, higher utilization rates, increased economic returns, and improved safety are among the direct benefits of AFA. They have also stated that the AFA has helped to mitigate the negative impacts of Steller sea lion (SSL) management measures as well as comply with the protection measures that were implemented. The flexibility provided by cooperatives, and by individual vessel allocations of pollock and other species has allowed the AFA fleet the ability to spread their effort in time and space to accommodate SSL conservation measures.

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

The Council, as outlined in policy, continues to incorporate local and traditional knowledge in fishery management. It also considers ways to enhance the collection of such information from communities, and incorporate it into fishery management, where appropriate. They also actively work to increase Alaska Native participation and consultation in fishery management through community workshops. Further, the Council has developed a rural-community outreach committee whose three primary tasks are: 1) to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; 2) to provide feedback on the 'community impacts' sections of specific analyses, if requested; and 3) to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. This has been particularly important with respect to CDQ allocation and salmon bycatch in the pollock fisheries.

The Alaska Region NMFS/RAM division requires that all vessels fishing or processing groundfish possess a federal fishing permit or a federal processing permit. The permit describes all pertinent information about the vessel and its' vessel fishing category, gear type and target fisheries. As a condition of these permits vessels must submit also comply with all regulations described in the GOA and BSAI FMPs. This includes reporting and landings requirements (e-landings and logbooks), carrying onboard observers or having shoreside observers at shore plants. This information is regularly up-dated and meets or exceeds the international standards and practices required to succinctly characterize the groundfish fisheries off Alaska.

In like manner, the State of Alaska, gathers similar information from all vessels fishing in state waters. However, Article VIII, Section 15 allows the State to limit entry into any fishery for purposes of resource conservation and to prevent economic distress among fishermen and those dependent upon them for a livelihood. Therefore, fishermen participating in state waters must hold approved entry permits (commercial fishing licenses/gear cards), and fish from licensed vessels. Licenses must be renewed annually with the Commercial Fisheries Entry Commission (CFEC) and comply with all state landing and reporting requirements. This information is collected at the individual vessel level at both the state and federal level.

From MSA direction, the Council, with the help of industry, has adopted over the years many technological and operational strategies to reduce target waste and discards. Initially the industry, working with Council, NMFS and Alaska Fisheries Development Foundation staff worked with cod end mesh size to eliminate the harvest of juvenile pollock. Results of this study showed that successful bycatch reduction of juveniles only occurred when catches were small (< 15 mt). Because pollock fishermen were also faced with prohibited species bycatch caps (PSC) on halibut and king and Tanner crab, they chose to switch to pelagic trawls that only fished a portion of the footrope on the bottom and had large (up to 35 ') leading edge meshes that allowed halibut and crab to escape. This net structure also allowed vessels to better target large adults near the bottom without having their fishery closed by reaching halibut or crab PSC caps. By targeting larger fish (closer to bottom), small fish (found higher in the water column than adults to avoid predation) are avoided. The success of this gear at reducing bycatch resulted in a regulation that limited directed pollock fishing to pelagic gear.

Season closure dates were thought to also benefit SSL by separating pollock harvest and reducing the chance of causing localized depletions of their prey. Closed areas were also used in both the GOA and BSAI to protect crab; these nearshore areas also provided protection to younger pollock.

When the Council prohibited bottom trawl for directed pollock fishing, the need for these closed areas were removed for the directed pollock harvesters. Other closed areas were brought into force near SSL rookeries and haulouts to provide SSL with a buffer between the large industrial pollock fishery and the main areas where female and young SSL spent most of their time foraging for prey.

The NMFS/AFSC staff maintains gear researchers who have worked with the industry to evaluate the gear for efficiency and its impact on the bottom habitat and on bycatch species. Other joint gear modification studies include tests of salmon excluder tunnels in pelagic trawls to reduce salmon as bycatch. For several years, the Bering Sea pollock industry has been working on developing a Chinook salmon excluder device for trawl gear, which allows salmon to escape from the trawl net underwater, while retaining pollock. The success of such devices relies on the different swimming behaviors of pollock and Chinook salmon. Through experimental fishery permits authorized by the Council and NOAA Fisheries, various iterations have been tested, and their voluntary use by pollock skippers is increasing. Recently, the GOA pollock industry has begun to consider how the Bering Sea Chinook salmon excluder might be adapted for the smaller GOA pollock fleet.

9. There shall be defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels.

Council and BOF guidelines, state and federal regulations and MSA with its National Standards all define to management agencies what must be done if a stock becomes depressed. The US Congress established new statutory requirements under the MSA in 2006 to end and prevent overfishing by the use of annual catch limits (ACLs) and accountability measures. These new requirements were implemented in 2010 for all stocks subject to overfishing and in 2011 for all stocks not subject to overfishing. A new provision of the MSA requires that the respective scientific and statistical committees (SSC) of the eight fishery management councils determine scientific benchmarks, while the councils continue to recommend quotas subject to these scientific benchmarks. This separation of authorities represents 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 also be established that trigger accountability measures to prevent overfishing. Accountability measures might include: (1) seasonal, area, and gear allocations; (2) bycatch limits; (3) closed areas; (4) gear restrictions; (5) limited entry; (6) catch shares; (7) in-season fishery closures; and (8) observer and vessel monitoring requirements. Accountability measures allow close monitoring of overall catch levels, as well as seasonal and area apportionments. They might close designated areas, or fisheries, if bycatch limits for prohibited species are attained. They also allow monitoring of any endangered or threatened mammals or seabirds and provide a database for evaluating likely consequences of future management actions.

The Council has consistently adopted the annual OFL 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. The NPFMC first defined OFL in 1991 as a catch limit that never should be exceeded. The NPFMC adopted more conservative definitions of OFL in 1996 and again in 1999, to comply with revised national guidelines. 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 FMSY), after Congress redefined the terms “overfishing” and “overfished” to mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce MSY on a continuing basis. The OFL could be set lower than catch at FMSY at the discretion of the SSC. OFL can be then virtually defined as a limit reference point.

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 BMSY, or a proxy for BMSY, the fishing mortality is reduced relative to the stock status.

The Council is not just interested in single species management, but seeks to maintain a healthy ecosystem to insure long term sustainability. Therefore both target and non-target species are regularly assessed and bycatch limits and PSC caps are in place to control impacts. Also, Essential Fish Habitat (EFH), as defined in MSA, 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 SSL protection areas around rookeries and haulouts (10 & 20 nm closures).

The pollock fishery has evolved from a simple bottom trawl fishery into a very target selective pelagic trawl fishery in both the GOA & BS. It further improved in the BS under the AFA Cooperative that only fishes pollock with a pelagic trawl. The AFA also improved under AFA because those BS regulations limited BS pollock vessels from competing with GOA pollock vessels. The bottom trawl pollock fishery was fairly non-selective to the target sized pollock which the fishery was pursuing and instead encountered significant quantities of crab and halibut PSCs, bycatch of cod, flatfish and other benthic fishes, non-target sized pollock and bottom invertebrates (as a modern reference see the diversity of catch that occurs in the annual and biannual NMFS summer bottom trawl surveys). The modern pelagic trawl is very selective, with BS discards of only about 1%, the AI bycatch is mostly rockfish (POP) and may reach 2% in parts of the GOA.

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

The North Pacific Fishing Vessel Owners association (NPFVO) provides a large and diverse training program that many of the professional pollock 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. 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. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training. (STCW is the international Standards of Training, Certification, & Watchkeeping.) In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of their world class ship simulator, state-of-the-art computer-based navigational laboratory, and modern classrooms equipped with the latest instructional delivery technologies.

The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's continually evolving maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals.

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. Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation (e.g. MSA), to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. 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.

The Restricted Access Management Program (RAM) is responsible for managing Alaska Region permit programs, including those that limit access to the Federally-managed fisheries of the North Pacific. 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 to qualified individuals in both limited and unlimited fisheries, and provides due process hearings and appeals as and when needed. The RAM division as well as the CFEC maintain on their websites, all the fishermen records for which fishing permits are issued.

E. Implementation, Monitoring and Control

11. 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.

The Alaska pollock fishery fleet uses enforcement measures including an observer program, vessel monitoring systems on board vessels and USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations, especially 50CFR679. 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.

The General Counsel for Enforcement and Litigation (GCEL) can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPs) or Notice of Violation and Assessment (NOVAs), or they can refer the case to the U.S. Attorney's Office for criminal proceedings. For perpetual violators or those whose actions have severe impacts upon the resource, criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the United States Attorney's Office.

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) and the Alaska Administrative Code (5 AAC 39.130 Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements). OLE mainly operates on shore, USCG at sea, and the AWT enforces heavily on shore. ADFG field staff is properly trained and can make arrests.

On January 8, 2002, an emergency interim rule (67 FR 956) was issued by NMFS to implement Steller sea lion protection measures. All vessels using pot, hook-and-line or trawl gear in the directed fisheries for pollock, Pacific cod or Atka mackerel are now required to have an endorsement on their federal fisheries permit. Section 679.7(a)(18) requires all vessels using pot, hook-and-line or trawl gear that are permitted to directly fish for Pacific cod, Atka mackerel or pollock to have an operable VMS. This requirement is necessary to monitor fishing restrictions in Steller sea lion protection and forage areas.

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 United States 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 United States and the Russian Federation are parties. Any violation shall be subject to civil penalties and permit sanctions under section 308 of the Magnuson Fishery Conservation and Management Act. The USCG monitors vessels transiting and operating in the Donut Hole, and takes appropriate action as needed. The USCG enforces high seas fishing regulation. For example, on October 16th 2011, NMFS Office of Law Enforcement reported U.S. actions against illegal high seas fishing from the Bangun Perkasa, seized by the Coast Guard about a month before for high-seas drift net fishing more than 2,600 miles south west of Kodiak, Alaska.

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

In Alaska waters, enforcement policy section 50CFR600.740 states:

(a) The MSA provides four basic enforcement remedies for violations, in ascending order of severity, as follows: (1) Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E). (2) Assessment by the Administrator of a civil money penalty. (3) For certain violations, judicial forfeiture action against the vessel and its catch. (4) Criminal prosecution of the owner or operator for some offenses. 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.

(b) Processing a case under one remedial form usually means that other remedies are inappropriate in that case. However, further investigation or later review may indicate the case to be either more or less serious than initially considered, or may otherwise reveal that the penalty first pursued is inadequate to serve the purposes of the MSA. Under such circumstances, the Agency may pursue other remedies either in lieu of or in addition to the action originally taken. Forfeiture of the illegal catch does not fall within this general rule and is considered in most cases as only the initial step in remedying a violation by removing the ill-gotten gains of the offense.

(c) If a fishing vessel for which a permit has been issued under the MSA is used in the commission of an offense prohibited by section 307 of the MSA, NOAA may impose permit sanctions, whether or not civil or criminal action has been undertaken against the vessel or its owner or operator. In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

The "Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions" issued by NOAA Office of the General Counsel – Enforcement and Litigation on March 16, 2011, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The purpose of this Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources. Under this Policy, NOAA expects to improve consistency at a national level, provide greater predictability for the regulated community and the public, improve transparency in enforcement, and more effectively protect natural resources. For significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's office for criminal prosecution.

The recent news story on October 16th, 2011, of the apprehension of the illegal driftnet vessel offshore of Dutch Harbour highlights the gravity of sanctions in the event of fishery law infringement. NOAA, working with the Office of the U.S. Attorney in Anchorage, is seeking forfeiture of the vessel and its catch. Federal law stipulates a process where the owner has a reasonable time to come forward and claim the vessel. If the owner of the vessel does not come forward after due process is followed, all alternatives to dispose of the vessel will be considered to find the most effective course of action. This legal process needs to run its course before any decision regarding disposition of the vessel or catch can be made. Once the investigation of the Bangun Perkasa's fishing activity is completed, NOAA will forward its findings to the U.S. Attorney's Office.

The Marine Division of AWT and the State of Alaska Department of Law pursue a very aggressive enforcement policy. They attend the BOF and are integral into the process for regulation formulation and legislation, analogous to the USCG attendance and input in the Council process.

F. Serious Impacts of the fishery on the Ecosystem

13. 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.

The NPFMC, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors on pollock and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem Considerations documents, and other research reports. The SAFE documents for BSAI and GOA pollock summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the pollock fishery on the ecosystem. SAFE reports also describe results of first-order trophic interactions for pollock from the ECOPATH model, an ecosystem modelling software package. While prominence of some interactions may be the result of insufficient data, estimation of prey interactions of adult pollock in the GOA appear reasonable. Since 2003, SAFE documents for BSAI and GOA have also included an annual summary Ecosystem Assessment in the appendix prepared by the Resource Ecology and Ecosystem Management group at the AFSC. The primary intent of the assessment is to summarize historical climate and fishing effects of the shelf and slope regions of the eastern BSAI, and GOA, and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function from an ecosystem perspective. It also looks at the effects of environmental change on fish stocks. Since 1999, this section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures.

In addition, the Final Programmatic Supplemental Environmental Impact Statement (PSEIS) is an extensive review of the Alaska Groundfish Fisheries (NMFS 2004). It provides information about effects of the fishery on the ecosystem and effects of the ecosystem on the groundfish fishery.

NOAA also supports the Fisheries And The Environment (FATE) program which focuses on the development, evaluation, and distribution of leading ecological and performance indicators. In 2006 & 2007, a number of FATE projects included a study to integrate pollock environmental variables.
In addition, the North Pacific ecosystem status report is a contribution by the North Pacific Marine Science Organization (PICES) to identify, describe, and integrate observations of change in the North Pacific Ocean that are occurring now, and have occurred during the past several years. Publication 1 represents the first attempt to describe, in a systematic and integrated fashion, the state of the North Pacific Ocean. This first step describes the present state of the marine ecosystems of the North Pacific Ocean (status), in the context of their recent (past five years) and longer variability (trends); it summaries regional assessments into a broad basin-wide synthesis; it identifies critical factors that cause changes in these ecosystems; and it identifies key questions and critical data gaps that inhibit understanding of these marine ecosystems.

For the Bering Sea, a large multiyear ecosystem project is winding towards completion. It consists of two large projects that will be integrated. One funded by the National Science Foundation (NSF's BEST program is the Bering Ecosystem STudy, a multi-year study (2007-2010)), the other funded by NPRB (BSIERP, is the Bering Sea Integrated Ecosystem Research Program (2008-2012)). The overlapping goals of the these projects led to a partnership that brings together some $52 million worth of ecosystem research over six years, including important contributions by NOAA and the US Fish & Wildlife Service. From 2007 to 2012, NPRB, NSF, and project partners are combining talented scientists and resources for three years of field research on the eastern Bering Sea Shelf, followed by two more years for analysis and reporting. For the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the $17.6 million Gulf of Alaska 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. The study includes two field years (2011 and 2013) followed by one synthesis year.

Because the most obvious fishing effects (overharvest, uncontrolled bycatch or ecosystem effects on apex predators such as Steller sea lions) are closely accounted for in the Councils FMP, the Ecosystem Chapters and the index analysis provide a means to evaluate ecosystem fishing effects. An index that has been suggested as a measure of overall top-down control of the ecosystem due to fishing is the trophic level of the fishery. The trophic level of the catch and the Fishery in Balance (FIB) indices have been monitored in the BS, AI, and GOA ecosystems to determine if fisheries have been “fishing-down" the food web by removing top-level predators and subsequently targeting lower trophic level prey. The FIB index was developed by Pauly et al. (2000) to ascertain whether trophic level catch trends are a reaction of deliberate choice or of a fishing-down the food web effect. This index declines only when catches do not increase as expected when moving down the food web (i.e., lower trophic levels are more biologically productive), relative to an initial baseline year. As in any single metrics of trophic level or FIB indices, however, this is the best available science, yet it may hide details about fishing events that scientists can’t discern. Actual area by area results are: The AI pollock Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the AI have been stable and close to their long-term means since 1999. The GOA Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the GOA have been stable and close to their long-term means since 1999. The BS Trophic Level of the Catch and the FIB (Fisheries in Balance) indices for the EBS have been stable and close to their long-term means since the 1970s.

Current concerns regarding salmon bycatch in pollock fisheries in the BS and GOA have prompted the Council to take fairly immediate action to place new salmon bycatch controls on the pollock fishery. In the Bering Sea, the Council met with industry and Western Alaskan in-river fishermen concerned with the perceived impacts from salmon bycatch in the pollock fisheries. The Council took action in 2009 to recommend a new approach to managing Chinook salmon bycatch in the Bering Sea pollock fishery under Amendment 91. This new approach combines a limit on the amount of Chinook salmon that may be caught incidentally with incentive plan agreements and performance standards to reduce bycatch. This program was designed to minimize bycatch to the extent practicable in all years, prevent bycatch from reaching the limit in most years, while providing the pollock fleet with the flexibility to harvest the total allowable catch. This program was implemented by NMFS for the 2011 fishery. Also work is ongoing to create a viable salmon excluder device for the pollock fishery.

In the GOA, Pacific salmon are taken as bycatch in the GOA groundfish fisheries, in which they are considered prohibited. Although five species of salmon are caught in the fisheries, the Council has been concerned about Chinook salmon, as the species with the highest bycatch in recent years. Chinook salmon bycatch primarily occurs in trawl fisheries, in the central and western regulatory areas. Between 2003 and 2010, the pollock target fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily nonpelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder. In 2011, the Council approved Chinook salmon prohibited species catch (PSC) limits for the GOA pollock fisheries in the central and western regulatory areas. Once these annual limits are reached, the pollock fishery in the respective regulatory area will be closed. The Council is also considering other, comprehensive management measures to address Chinook salmon bycatch in the GOA trawl fisheries

Since the NMFS informed the Council about the precipitous decline in the Western discreet population of Steller sea lions in 1990, the NPFMC has acted in a precautionary manner to place protections around rookeries and haulouts and close areas where fishing may impact SSL prey. NMFS first declared that this part of the SSL population was Threatened and then determined that it was Endangered under the ESA. The Council and industry petitioned Congress for special research funds to attempt to determine what was causing the decline of SSL and whether fisheries might be involved in the decline or the delayed recovery of the Western population. To date, nearly $200,000,000 was appropriated and provided in this research effort. No direct links between fishing and decline or delayed recovery of SSL were evident in this research. In fact, a reverse trend is observed when one plots abundance of pollock and cod against SSL. As the population of SSL declines, the biomass of cod and pollock increase. Nevertheless, on the side of precaution, NMFS implemented numerous protection measures over the years. And while part of the stock appears to be recovering, SSL in the Central and Western Aleutian Islands continue to show declines. NMFS's most recent Biological Opinion indicates that there is still a likelihood of jeopardy from fishing in that area, so more restrictions were implemented. A recent peer review of the latest Biological Opinion found the evidence lacking for their assertions. But precautionary protections will remain until such a time that these issues can be resolved and a new recovery plan can be formulated based on new findings.

The SAFE documents from the various management areas and the Ecosystem Chapter describe how each of the life stages of pollock fit into the food web. Pollock, because it is such an abundant component of the ecosystem, is both a key prey species and a key predator species. Pollock form vast pelagic spawning aggregations in the winter and early spring. These aggregations are both important to fishermen and predators of pollock. Many of the pollock regulations promulgated by the Council address protections on the spawning stock, such as: prohibition on roe stripping, A/B-season apportionment of TAC, SSL protective closure areas where SSL forage, and closing the Bogoslof spawning area to all harvest. Other than adult pollock, Pacific cod and Arrowtooth flounder are two of the main fish predators. Arrowtooth are very abundant in both the BS and GOA and appear to prey heavily on 0 and 1 age pollock. Also, young marine mammals (fur seals and SSL) may target younger pollock.

The MSA also mandated identification, conservation and enhancement of essential fish habitat (EFH) for managed species. The MSA requires cooperation among NOAA Fisheries Service, fishery management councils, fishing participants, federal and state agencies, and others in achieving EFH protection, conservation and enhancement. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The Council implemented the EFH amendments into its GOA and BSAI FMPs, and most recently defined EFH for pollock and all managed species in 2010. Effects of fishing on the seafloor near pollock habitat off Alaska have been largely described as less than minimum and less than temporary.

6.1. Conformity statement

The Assessment Team recommend that the management system of the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

6.2. Future Surveillance Actions

To maintain certification, surveillance assessments are carried out on an annual basis with a full re-assessment taking place for the fifth anniversary of certification. The surveillance assessment will be carried out as outlined for Global Trust Certification quality procedure.

7. FAO-Based RFM Conformance Criteria Assessment Outcome

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 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 28***						
Confidence Ratings	**Low**	**0 out of 17**	**Medium**	**0 out of 17**	**High**	**17 out of 17**

Clause: **1.1 There shall be an effective legal and administrative framework established at the local and national level appropriate for fishery resource conservation and management.** ***FAO CCRF 7.7.1*** ***FAO Eco 28***	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause	**Evidence**
1.1	**There is an effective legal (MSA, FMPs) and administrative framework (NMFS/NPFMC – ADFG/BOF) established at the local and national level (state/federal) appropriate for fishery resource conservation and management.** The primary layer of governance for the Alaska pollock fisheries is dictated by the MSA. The main agencies involved in pollock management within Alaska's EEZ (NMFS, NPFMC), and all of their activities and decisions, are subject to the MSA. The MSA, as amended last on January 12th 2007, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all Fishery Management Plan (FMP) must be consistent. Under the MSA, the NPFMC is authorized to prepare and submit to the Secretary of Commerce for approval, disapproval or partial approval, a FMP and any necessary amendments, for each fishery under its authority that requires conservation and management.

	While the State of Alaska mostly adopts complimentary regulations, even imposing an annual State Emergency Order that adopts federal Regulations, state regulations are used to manage 0-3 nmi & inside waters (not subject to MSA). The FMPs, more specifically, 1) the GOA Groundfish FMP, and 2) the BSAI Groundfish FMP govern the management of the pollock federal fisheries. In federal waters (3-200 nm), Alaska Pollock fisheries are managed by the NPFMC and the NMFS Alaska Region. The NPFMC is one of eight regional councils established by the MSA to oversee management of the nation's fisheries. With jurisdiction over the million square mile EEZ off Alaska, the NPFMC has primary responsibility for groundfish management in the GOA and BSAI, including cod, pollock, flatfish, mackerel, sablefish, and (offshore) rockfish species harvested mainly by trawlers, hook and line longliners and pot fishermen. The Council submit their recommendations/plans to the NMFS for review, approval, and implementation. NMFS makes those recommendations available for public review and comment (partly by publication) before taking final action by issuing legally binding Federal regulations. In addition, NMFS Alaska Regional Office conducts biological studies, stock survey and stock assessment reports. NOAA Fisheries is also charged with carrying out the federal mandates of the U.S. Department of Commerce with regard to commercial fisheries such as approving and implementing FMPs and FMP amendments recommended by the Council. The USCG is responsible for enforcing these FMPs at sea, in conjunction with NMFS enforcement ashore. Also, the USCG enforce laws to protect marine mammals and endangered species, international fisheries agreements (i.e. UN High Seas Driftnet Moratorium in the North Pacific), and foreign encroachment. In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF. The Prince William Sound state pollock fishery is managed using a harvest rate strategy, where the Guideline Harvest Level (GHL) is the product of the biomass estimate, instantaneous natural mortality rate (0.3) and a precautionary factor of 0.7. Biomass is estimated by bottom trawl surveys in summer and hydroacoustic surveys in winter. In 1999 the BOF directed the ADFG to establish a PWS pollock trawl fishery management plan to reduce potential impacts on the endangered population of Steller sea lions by geographically apportioning the catch. Although pollock in the GOA are considered one stock, pollock in PWS appear not to be assessed by NMFS surveys in the GOA. Therefore, ADFG surveys of pollock in PWS are used to set the GHL, rather than setting the GHL in PWS as a fraction of the federal TAC for the GOA. Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. A parallel groundfish fishery occurs where the State allows the federal species total allowable catch (TAC) to be harvested in State waters. Parallel fisheries occur for pollock, Pacific cod, and Atka mackerel species, for some or all gear types. Opening state waters allows the effective harvesting of fishery resources because many fish stocks straddle State and Federal jurisdiction and in some cases a significant portion of the overall federal TAC is harvested within State waters. Although the State cannot require vessels fishing inside state waters during the Federal fishery to hold a Federal permit, it can adopt regulations similar to those in place for the Federal fishery if those regulations are approved by the Board of Fisheries and meet State statute.	

	An example of a Federal fishery regulation that was concurrently adopted by the Board of Fisheries is the Steller sea lion protection measures implemented in 2001. The effort in the patrol and enforcement of state waters regulations is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT). http://www.nmfs.noaa.gov/sfa/magact/mag1.html#s2 http://www.fakr.noaa.gov/npfmc/ http://www.fakr.noaa.gov/ http://www.uscg.mil/hq/cg5/cg531/LMR.asp http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.management http://www.dps.alaska.gov/awt/Marine.aspx	

Clause:
1.2 Management measures shall take into account the whole stock unit over its entire area of stock distribution.
1.2.1 The area through which the species migrates during its life cycle shall be considered by the management system.
1.2.2 The biological unity and other biological characteristics of the stock shall be considered within the management system.
FAO ECO 30.3
1.2.3 All fishery removals and mortality of the target stock(s) shall be considered by management.
1.2.4 Previously-agreed management measures established and applied in the same region shall be taken into account by management.
FAO CCRF 7.3.1

Evidence adequacy rating:	
☑High ☐ Medium ☐ Low	
Clause:	**Evidence:**
1.2	**Management measures (GOA/BSAI FMPs) take into account the whole stock unit over its entire area of stock distribution (GOA, BSAI, Cape Navarin).** Walleye pollock (*Theragra chalcogramma;* hereafter referred to as pollock) are broadly distributed throughout the North Pacific with the largest concentrations found in the Eastern Section of the Bering sea. In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes and are managed within the framework of the BSAI Groundfish FMP. These are: 1) pollock occurring on the Eastern Bering Sea shelf from Unimak Pass to the U.S.-Russia Convention line; 2) the Aleutian Islands Region encompassing the Aleutian Islands shelf region from 170W to the U.S.-Russia Convention line; 3) and the Central Bering Sea Bogoslof Island pollock spawning aggregations. These three management stocks undoubtedly have some degree of exchange. The Bogoslof stock forms a distinct spawning aggregation (although no directed pollock fishing here, this aggregation is rebuilding) that has some connection with the deep water region of the Aleutian Basin.

In the Russian EEZ, pollock are considered to form two stocks, a western Bering Sea stock centered in the Gulf of Olyutorski, and a northern stock located along the Navarin shelf from 171E to the U.S. - Russia Convention line. There is some indication (based on NMFS surveys) that the fish in the northern region may be a mixture of eastern and western Bering Sea pollock with the former predominant. This stock is the only one which is shared with Russian waters to a very small degree (1% in 2009) and is managed accordingly in terms of international research (U.S. surveys in Cape Navarin area, clause 1.2.1) and agreements (see below, bilateral ICC).

Pollock in the Gulf of Alaska are managed as a single stock independently of pollock in the Bering Sea and Aleutian Islands, within the framework of the GOA Groundfish FMP. The separation of pollock in Alaskan waters into eastern Bering Sea and Gulf of Alaska stocks is supported by analysis of larval drift patterns from spawning locations, genetic studies of allozyme frequencies, mtDNA variability, and microsatellite allele variability.

The results of studies of stock structure in the Gulf of Alaska are equivocal. There is evidence from allozyme frequency and mtDNA that spawning populations in the northern part of the Gulf of Alaska (Prince William Sound and Middleton Island) may be genetically distinct from the Shelikof Strait spawning population. However significant variation in allozyme frequency was found between Prince William Sound samples in 1997 and 1998, indicating a lack of stability in genetic structure for this spawning population. Olsen et al. (2002) suggest that interannual genetic variation may be due to variable reproductive success, adult philopatry, source-sink population structure, or utilization of the same spawning areas by genetically distinct stocks with different spawning timing. Peak spawning at the two major spawning areas in the Gulf of Alaska occurs at different times. In the Shumagin Island area, peak spawning apparently occurs between February 15-March 1, while in Shelikof Strait peak spawning occurs later, typically between March 15 and April 1. It is unclear whether the difference in timing is genetic, or a response to differing environmental conditions in the two areas. All in all, the Gulf of Alaska spawning aggregations (PWS, Shelikof, Shumagin) are managed within the GOA Fishery Management Plan. Another spawning location is situated in Northern Canada but the entire Eastern Gulf of Alaska is banned from the use of trawl gear (i.e. no pollock fisheries) and there is likely no interaction with central/western GOA FMP managed pollock (Please refer to introductory sections and maps provided in Section 3 of the report).

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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. 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 Exclusive Economic Zones (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. These meetings have also resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea.

	Alaska pollock are also found in international waters where no country has sole jurisdiction. 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. 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. The United States continues to promote and support these international conservation measures. http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf http://thomas.loc.gov/cgi-bin/cpquery/R?cp106:FLD010:@1%28hr195%29 http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence:**
1.2.1	**The area through which the species migrates during its life cycle (spawning, feeding) is considered by the management system.** In the Gulf of Alaska, pollock are considered as a single stock separate from those in the Bering Sea and Aleutian Islands. They are semidemersal (i.e., semi-bottom dwelling) distributed from near the surface to depths of 500 m. In the BSAI region, three areas are identified for pollock management purposes. These include the eastern Bering Sea shelf, the Aleutian Islands Region and the Central Bering Sea—Bogoslof Island area. In late winter/early spring pollock form huge spawning aggregations, including those found in Shelikof Strait and the eastern Bering Sea northwest of Unimak Island. Smaller aggregations in the Gulf of Alaska include those at the Shumagin Islands, the entrance to Prince William Sound, and near Middleton Island. In summer, large aggregations have been found on the east side of Kodiak Island, nearshore along the southern Alaska Peninsula, and other areas. Pollock migrate seasonally between spawning and feeding areas. They feed on copepods, euphausiids, and fish, and are preyed on by other fish, marine mammals, and seabirds. The stocks of pollock within Alaska's Eastern Bering Sea occur largely within the Alaska EEZ, but there is some apparent migration of pollock to the northwest which can result in varying amounts of Eastern Bering Sea shelf pollock found in the Cape Navarin area of Russia. This seasonal movement is thought to be ontogenetic (with younger pollock in a nursery area in the northern zone) with regular migrations to the southeast region for spawning and summer shelf regions for feeding. For the latest year of data available, 2009, the Alaska EEZ contained more than 99% of the pollock stock. This can be seen in Table 7 (as well as previous years) and in Figure 6 of the document "Results of the Acoustic-Trawl Survey of Walleye Pollock (*Theragra chalcogramma*) on the U.S. and

Russian Bering Sea Shelf in June - August 2009 (DY0909)" available at http://www.afsc.noaa.gov/Publications/ProcRpt/PR2010-03.pdf.

These surveys are largely carried out by the U.S. (apart in 2002 by Russia). Stock assessments used for U.S. management (setting the upper limit of the TAC) have considered this migration and possible removals using sensitivity analyses. Results of these sensitivities presented in past EBS pollock SAFE Reports indicate that the default approach used (i.e., implicitly assuming movement and subsequent harvests within the Russian zone represent a minor but unknown component of additional mortality) provides added precaution to the U.S. TAC-setting process. Also, the assessment model attempts to incorporate inter-annual variability of movement into the Russian zone by allowing for time-varying age-specific survey selectivity. This adds to the estimates of uncertainty which, by the control rules applied, results in more precautionary harvest recommendations.

Year	Bering Sea EEZ region	Numbers (billions)	Biomass (million metric tons)	% Biomass	Survey nation	Area (nmi^2)
1994	US	12.60	3.72	85	US	78,250
	Russia	2.77	0.65	15	US	18,460
	Total	15.37	4.37			
2002	US	13.81	4.53	98	US	99,526
	Russia	0.75	0.08	2	Russia	32,270
	Total	14.56	4.61			
2004	US	7.95	4.03	91	US	99,659
	Russia	1.55	0.40	9	US	7,870
	Total	9.51	4.43			
2007	US	10.24	2.40	96	US	92,944
	Russia	1.09	0.11	4	US	12,460
	Total	11.33	2.51			
2008	US	5.47	1.54	98	US	95,374
	Russia	0.07	0.03	2	US	12,073
	Total	5.54	1.58			
2009	US	9.25	1.33	99	US	91,414
	Russia	0.02	0.01	1	US	11,714
	Total	9.27	1.34			

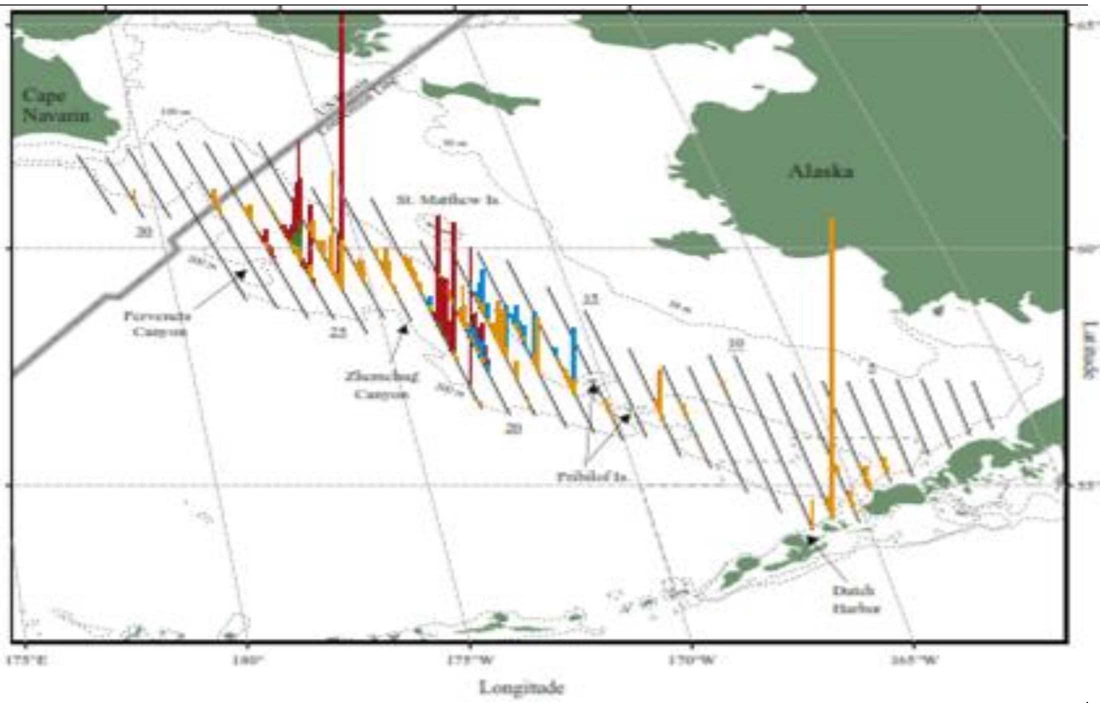


Figure 6. Estimated juvenile (< 19 cm, blue; 19-26 cm, green; 27-38 cm, dark orange) and adult (> 38 cm, light orange) walleye pollock biomass (t) by 0.5 nmi interval for the summer 2009 acoustic-trawl survey (16 m from the surface to 3 m off bottom). Transect numbers are underlined, and the Steller sea lion Conservation Area (SCA) is outlined (dashed line).

http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf
http://www.afsc.noaa.gov/Publications/ProcRpt/PR2010-03.pdf

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence:
1.2.2	**The biological unity and other biological characteristics (spawning and pre-spawning seasons) of the stock is considered within the management system.** The biological unity and other biological characteristics of the stock are considered within the management system. The Pollock fishery is apportioned between spawning and pre-spawning seasons in the Bering Sea. The GOA fishery is apportioned in 4 quarters. In addition, Euphausiids, principally *Thysanoessa inermis* and *T. raschii*, are among the most important prey items for walleye pollock in the Bering Sea. The research carried out in the EBS shelf, collects data on euphausiids, a key prey species of pollock. The 2004-2009 time series of Bering Sea summer euphausiid abundance shows that euphausiid backscatter has increased more than three-fold. Other data sets from the Bering Sea have also suggested an increase in large copepods since 2004. Over the same period of time, midwater pollock backscatter measured by the AT survey decreased by half, and walleye

pollock age 3+ biomass estimated by the stock assessment model shows a similar decline. These opposing trends of euphausiid (prey) and pollock (predator) abundance may be related or they may be independent responses to changes in environmental conditions. These euphausiid backscatter data are spatially explicit, so distribution, as well as abundance, can be tracked over time. This euphausiid index may help the AFSC to better understand temporal and spatial variability in walleye pollock abundance. The figure below shows the Acoustic Backscatter frequencies as attributed to pollock and euphausiid in the EBS in 2009 (from http://www.afsc.noaa.gov/Publications/ProcRpt/PR2010-03.pdf).

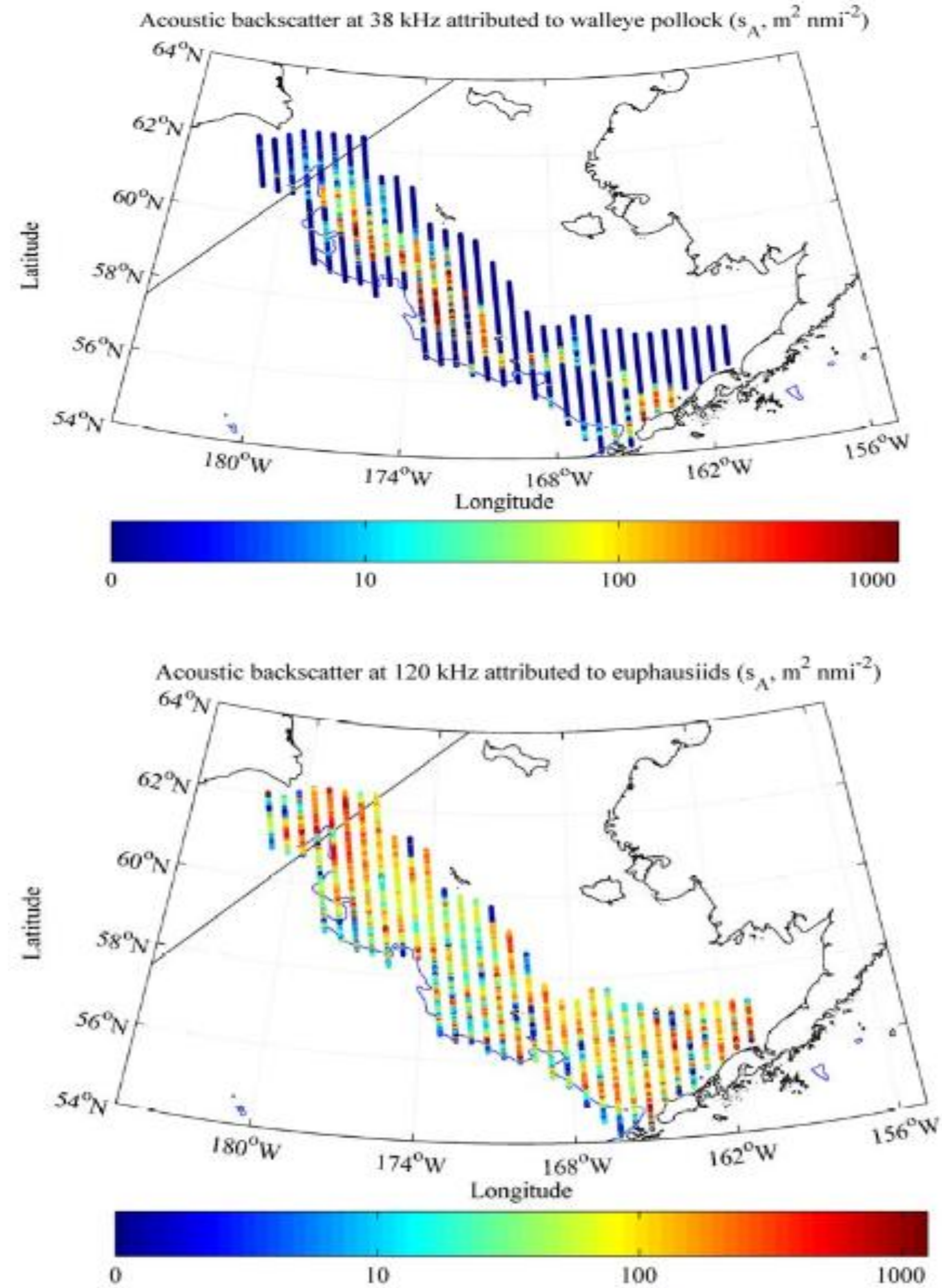


Figure 18. Pollock (above) backscatter at 38 kHz (left panel) and euphausiid (below) backscatter at 120 kHz (right panel) along tracklines from the summer 2009 acoustic-trawl survey of Bering Sea walleye pollock (http://www.afsc.noaa.gov/Publications/ProcRpt/PR2010-03.pdf)

Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	**Evidence:**
1.2.3	**All fishery removals and mortality of the target stock(s) are considered (EBS and GOA SAFEs) by management.** All fishery removals and mortality of the target stock(s) are be considered by management. For both the BSAI and the GOA pollock stocks (see EBS and GOA pollock SAFEs), the management organizations collect the necessary information on removals and mortality (including natural mortality) of the target stock, as well data on bycatch and discards. Strictly enforced landing reports, at sea and shore-based fishery enforcement, fishery observers and an extensive mandatory and voluntary logbook program verify and ground-truth total mortality estimates. These data can be found in the EBS (Table 1.4) and in the GOA (Table 1.4) Pollock SAFE Reports where the following tables have been respectively reported from.

Table 1.4. Estimates of discarded pollock (t), percent of total (in parentheses) and total catch for the Aleutians, Bogoslof, Northwest and Southeastern Bering Sea, 1991-2010. SE represents the EBS east of 170° W, NW is the EBS west of 170° W, source: NMFS Blend and catch-accounting system database. 2010 data are preliminary.

	Discarded pollock					Total (retained plus discard)				
	Aleutian Is.	Bogoslof	NW	SE	Total	Aleutian Is.	Bogoslof	NW	SE	Total
1991	5,231 (5%)	20,327 (6%)	48,205 (9%)	66,789 (10%)	140,552 (9%)	98,604	316,038	542,056	653,552	1,610,288
1992	2,982 (6%)	240 (100%)	57,609 (10%)	71,195 (9%)	132,026 (9%)	52,352	241	559,771	830,560	1,442,924
1993	1,733 (3%)	308 (35%)	26,100 (11%)	83,989 (8%)	112,130 (8%)	57,132	886	232,173	1,094,431	1,384,622
1994	1,373 (2%)	11 (2%)	16,083 (9%)	88,098 (8%)	105,565 (8%)	58,659	556	176,777	1,152,573	1,388,565
1995	1,380 (2%)	267 (80%)	9,715 (11%)	87,491 (7%)	98,853 (7%)	64,925	334	91,941	1,172,304	1,329,503
1996	994 (3%)	7 (1%)	4,838 (5%)	71,367 (7%)	77,206 (6%)	29,062	499	105,938	1,086,840	1,222,339
1997	617 (2%)	13 (8%)	22,557 (7%)	71,031 (9%)	94,218 (8%)	25,940	163	304,543	819,888	1,150,533
1998	164 (1%)	3 (2%)	1,581 (1%)	15,135 (2%)	16,883 (2%)	23,822	136	135,399	965,767	1,125,123
1999	480 (48%)	11 (38%)	1,912 (1%)	27,089 (3%)	29,492 (3%)	1,010	29	206,697	783,119	990,855
2000	790 (64%)	20 (69%)	1,941 (1%)	19,678 (2%)	22,429 (2%)	1,244	29	293,532	839,175	1,133,981
2001	380 (46%)	28 (11%)	2,450 (1%)	14,873 (2%)	17,731 (1%)	824	258	425,219	961,889	1,388,190
2002	758 (66%)	12 (1%)	1,439 (0%)	19,226 (2%)	21,435 (1%)	1,156	1,042	320,463	1,159,730	1,482,391
2003	468 (28%)	NA	2,980 (1%)	14,063 (2%)	17,512 (1%)	1,653	NA	557,552	933,459	1,492,664
2004	758 (66%)	NA	2,781 (0.2%)	20,380 (1.4%)	23,783 (2%)	1,158	NA	390,544	1,089,999	1,482,373
2005	324 (20%)		2,586 (0.2%)	14,838 (1.0%)	17,424 (1.2%)	1,621		680,868	802,418	1,484,907
2006	310 (18%)		3,672 (0.2%)	11,659 (0.8%)	15,331 (1.0%)	1,744		659,455	826,980	1,488,180
2007	425 (17%)		3,560 (0.3%)	12,313 (0.9%)	15,873 (1.2%)	2,519		626,003	728,094	1,356,616
2008	81 (6%)		1,644 (0.2%)	5,952 (0.6%)	7,597 (0.8%)	1,278		508,023	482,542	991,843
2009	345 (20%)		1,936 (0.2%)	4,009 (0.5%)	5,945 (0.7%)	1,729		452,417	358,314	809,467
2010	93 (8%)		1,033 (0.1%)	2,358 (0.3%)	3,391 (0.4%)	1,127		553,907	251,283	

Table 1.4. Catch (retained and discarded) of walleye pollock (t) by management area in the Gulf of Alaska during 2000-2009 compiled by the Alaska Regional Office.

Year	Utilization	Shumagin 610	Chirikof 620	Kodiak 630	West Yakutat 640	Prince William Sound 649 (state waters)	Southeast and East Yakutat 650 & 659	Total	Percent discard
2000	Retained	21,380	11,314	35,078	1,917	1,181	0	70,870	
	Discarded	694	443	854	191	22	4	2,209	3.0%
	Total	22,074	11,757	35,933	2,108	1,203	4	73,080	
2001	Retained	30,298	17,186	19,942	2,327	1,590	0	71,344	
	Discarded	173	205	330	24	0	0	732	1.0%
	Total	30,471	17,391	20,272	2,351	1,590	0	72,076	
2002	Retained	17,046	20,106	10,615	1,808	1,216	0	50,791	
	Discarded	416	425	287	10	6	2	1,146	2.2%
	Total	17,462	20,531	10,902	1,818	1,222	2	51,937	
2003	Retained	16,347	18,972	12,225	940	1,118	0	49,603	
	Discarded	161	658	210	2	31	0	1,063	2.1%
	Total	16,508	19,630	12,435	943	1,149	0	50,666	
2004	Retained	23,226	24,221	13,896	215	1,100	0	62,658	
	Discarded	342	438	459	11	26	0	1,276	2.0%
	Total	23,568	24,659	14,355	226	1,127	0	63,934	
2005	Retained	30,791	27,286	18,986	1,876	740	0	79,680	
	Discarded	136	621	350	9	50	0	1,166	1.4%
	Total	30,927	27,908	19,336	1,885	790	0	80,846	
2006	Retained	24,489	26,409	16,127	1,570	1,475	0	70,070	
	Discarded	203	750	951	2	1	0	1,906	2.6%
	Total	24,691	27,159	17,078	1,572	1,476	0	71,976	
2007	Retained	17,694	18,846	13,777	84	NA	0	50,401	
	Discarded	262	516	701	3	NA	1	1,483	2.8%
	Total	17,956	19,362	14,478	87	1,179	1	53,062	
2008	Retained	15,100	18,691	13,335	1,155	NA	0	48,281	
	Discarded	2,157	367	1,052	6	NA	2	3,584	6.8%
	Total	17,257	19,058	14,387	1,161	635	2	52,500	
2009	Retained	14,475	13,579	10,974	1,190	NA	0	40,219	
	Discarded	461	421	1,263	31	NA	0	2,177	4.9%
	Total	14,936	14,000	12,238	1,221	1,608	0	44,003	
Average (2000-2009)		21,585	20,145	17,141	1,337	1,198	1	61,408	

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence:
1.2.4	**Previously agreed management measures established and applied in the same region are taken into account by management (Donut Hole Convention, NPFMC and BOF public meetings).** The Alaska pollock fishery management system (NPFMC/NMFS; 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 (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 Stellar sea lion protection have been not only maintained through the years, but increased. Also, the fishery continues to respond to issues related to salmon bycatch. In 2008 - 2010, bycatch levels for Chinook salmon have been well below average following record high levels in 2007, likely due to industry-based restrictions on areas where pollock fishing may occur and also due to environmental conditions (and perhaps salmon abundance). Many other examples exist that show the continued implementation of previously agreed regulations (and improvement) for pollock management as needed within the Alaska EEZ. However, on a more general perspective, the NPFMC and BOF public meetings (the Council meets five times each year, usually in February, April, June, October and December; the BOF meetings generally occur from October through March, four to six times per year) allow 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. http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf http://www.fakr.noaa.gov/npfmc/public-meetings/meeting-calendar.html http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main

Clause:

1.3 Where trans-boundary, straddling or highly migratory fish stocks and high seas fish stocks are exploited by two or more States, the Applicant Management Organizations concerned shall cooperate and take part in formal fishery commission or arrangements that have been appointed to ensure effective conservation and management of the stock/s in question.

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

FAO CCRF 7.1.3/7.1.4/7.3.2

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause	Evidence	
1.3	**The management organizations concerned cooperate and take part in formal fishery commission/arrangements (ICC forum, Donut Hole Convention) that have been appointed to ensure effective conservation and management of the stock/s in question.** 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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. 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 Exclusive Economic Zones (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. These meetings have also resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea. The Donut Hole convention agreement established responsibility 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. The United States continues to promote and support these international conservation measures. http://thomas.loc.gov/cgi-bin/cpquery/R?cp106:FLD010:@1%28hr195%29 http://www.nmfs.noaa.gov/fishwatch/species/walleye_pollock.htm	

Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause	**Evidence**	
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, are compatible (ICC forum, Donut Hole Convention).** Pollock lives and migrates largely within the Alaska EEZ. There is an ICC agreement between US and Russia. Coast Guards of the two Countries cooperate and share information conducive to the study, management and conservation of the stock. See section 1.3. above.	

Clause:

1.4 **Organizations within the Management System shall cooperate with neighbouring coastal states with respect to common and shared fishery resources for their conservation and for the conservation of the environment.**

FAO CCRF 10.3, **7.1.4 and 7.1.5**

1.4.1 **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

1.4.2 **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

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause	Evidence	
1.4	**Organizations within the Management System cooperate (ICC forum, Donut Hole Convention) with neighbouring coastal states with respect to common and shared fishery resources for their conservation and for the conservation of the environment.** The Bering sea pollock Agreement of 1994, a six-nation agreement (Russia, the US, Canada, Japan, South Korea, and Poland) sets up a cooperative arrangement to manage the Pollock stocks located in the central Bering Sea lying beyond the Exclusive Economic Zones of Russia and the US. Based on the best available scientific knowledge, it represents a successful collaboration between coastal states (Russia and the US) and distant-water fishing states (the other four signatories). See also ICC US-Russia agreement on clause 1.3. North Korea is not a signatory of the Bering sea Pollock Agreement. No evidence indicates this country engages in pollock fishing within the convention area. http://www.arcticgovernance.org/the-bering-sea-pollock-agreement.4668243-142904.html	

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause	Evidence	
1.4.1	**Only states member/participant of a sub-regional or regional fisheries management organization are/may be present in the area in question. These 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.** In the case of Alaska Pollock, all member states that originally signed up the Donut hole agreement still cooperate, in accordance with the relevant international agreements, for the conservation and management of the high seas pollock resource by giving effect to any relevant measures adopted in the original 1994 agreement. See Clause 1.4.	

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause	Evidence	
1.4.2	**No State takes action through a non-fishery organization which may affect the conservation and management measures as agreed through the Donut Hole convention (signed by Russia, the US, etc...).** No State seeks to take any action through a non-fishery organization which may affect the conservation and management measures taken as agreed through the Bering sea pollock Agreement of 1994, a six-nation agreement (Russia, the US, Canada, Japan, South Korea, and Poland). See Clause 1.4.	

Clause:

1.5 The Applicant fishery's management system shall actively foster cooperation between States with regard to:

- **Information gathering and exchange**
- **Fisheries research**
- **Fisheries management**
- **Fisheries development**

FAO CCRF 7.3.4

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause	Evidence	
1.5	**Alaska and Russia's management system actively foster cooperation with regard to information gathering and exchange, fisheries research and fisheries management/development relative to walleye pollock.** Alaska and Russia foster cooperation in regards to information gathering for fisheries research and exchange of such information. Both States routinely allow scientists from the other country onboard research vessels. In addition, as explained in Clause 1.2.1., the stocks of pollock within Alaska's Eastern Bering Sea occur largely within the Alaska EEZ, but a small North West migration of pollock, results in a very small proportion of the Eastern Bering Sea shelf pollock to be	

	found in the Cape Navarin area of Russia. Research results for the Bering Sea acoustic-trawl surveys in the United States and in the Cape Navarin area of Russia illustrate the developing exchange of information for fisheries research and management purposes between the two countries. Within the ICC agreement, the research with the US research vessel Oscar Dyson carries Russian scientists on board. Russian scientists come routinely into Alaska universities. No pollock fisheries development occurs between the two countries as the fisheries are fully developed (http://www.afsc.noaa.gov/Publications/ProcRpt/PR2010-03.pdf).	

Clause:

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

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

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause	Evidence	
1.6	**Alaska has clear means for financing the activities of fishery management organizations and arrangements (detailed in GOA and BSAI Groundfish FMPs). Where appropriate, the costs for fisheries conservation, management and research are recovered.** Specific costs incurred during the management, research and enforcement of the groundfish stocks in the BSAI and GOA are reported in the BSAI and GOA Groundfish Fishery Management Plans. Please refer to these management plans for precise expenditure figures. Generally speaking, the costs of fisheries management and conservation in the U.S. derive from the following services and are funded through Congressional appropriations.	

1) **Research;** data collection, surveys, data analysis, and stock assessment services are mainly financed through Congressional appropriations, other public sector funding, and industry funding.
2) **Management;** conservation and management of the fishery and services for fishery participants, state and industry assistance programs, including marine fisheries commissions, disaster assistance are mainly financed through Congressional appropriations and industry.
3) **Enforcement;** vessel boarding, dockside monitoring, vessel monitoring system (VMS) implementation, auction inspection, aerial surveillance, criminal investigations are funded through Congressional appropriations and industry (for some VMS).

Wherever possible, in addition to appropriations, fishery management organizations will seek to balance the costs of management by organizing self funding programs. An example is the restructuring of the current groundfish observer program. The proposed action would replace the existing observer service delivery model, in which industry contracts directly with observer providers to meet observer coverage requirements in Federal regulations, with a new system (i.e., restructuring) in which NMFS would contract directly with observer providers and to determine when and where observers are deployed. Vessels and processors under the restructured observer program would pay either a fee based on a percentage of ex-vessel revenue (not to exceed 2%), or a daily observer fee, to fund the program.

NOAA budget

The National Oceanic and Atmospheric Administration (NOAA) budget is divided into two primary accounts: Operations, Research and Facilities (ORF) and Procurement, Acquisition and Construction (PAC). These two accounts make up over 99 percent of the total Fiscal Year (FY) 2011 NOAA appropriation. Other accounts include Pacific Coastal Salmon Recovery, Coastal Impact Assistance Fund, Fishermen's Contingency Fund, Foreign Fishing Observer Fund, Fisheries Finance Program Account, Promote and Develop American Fishery Products and Research Pertaining to American Fisheries Fund, Damage Assessment and Restoration Revolving Fund, Coastal Zone Management Fund, Federal Ship Financing Fund, Limited Access System Administration Fund, Environmental Mammal Unusual Mortality Event Fund, and Medicare-Eligible Retiree Healthcare Fund.

NMFS is dedicated to the stewardship of living marine resources through science-based conservation and management within the 200-mile U.S. EEZ. NMFS also provides critical support and scientific and policy leadership in the international arena, and plays a key role in the management of living marine resources in coastal areas under state jurisdiction. The President's FY 2011 Budget requests a net increase of $79.9 million for NMFS (including the Pacific Coastal Salmon Recovery Fund and the Fisherman's Contingency Fund).

The NMFS budget generally covers **the following:**
1) Protected Species Research & Management;
2) Fisheries Research and Management;
3) Enforcement & Observers/Training;
4) Habitat Conservation & Restoration;
5) Other Activities Supporting Fisheries.

Other NOAA Accounts

Pacific Coastal Salmon Recovery Fund was established in FY 2000 to fund State, Tribal and local conservation initiatives to help recover threatened and endangered Pacific salmon populations in the states of California, Washington, Oregon, Idaho, and Alaska. FY 2011 President's Request includes $65 million for the Pacific Coastal Salmon Recovery Fund.

NOAA uses the **Fishermen's Contingency Fund** to compensate domestic fishermen for the damage or loss of fishing gear and resulting economic loss due to obstructions related to oil and gas exploration, development or production in the Outer Continental Shelf. The funds come from fees collected annually by the Secretary of the Interior from the holders of leases, explorations, permits, easements, and rights of way. FY 2011 President's Request includes $350 thousand for the Fisherman's Contingency Fund.

The **Foreign Fishing Observer Fund** provides observer coverage of foreign fishing activities within the 200-mile EEZ. Fees collected from foreign governments with fishing vessels within the exclusive fishery jurisdiction of the U.S. finance the fund and are used to pay salaries, administrative costs, data entry, and other expenses associated with the placement of observers aboard foreign fishing vessels.

The **Fisheries Finance Program Account** provides direct loans that promote building sustainable fisheries. The program provides Individual Fishing Quota (IFQ) financing at the request of a Fishery Management Council. The program also makes long term fixed rate financing available to U.S. citizens who otherwise do not qualify for financing and refinancing of the construction, reconstruction, reconditioning, and in some cases, the purchasing of fishing vessels, shoreside processing, aquaculture, and mariculture facilities. These loans provide stability to at least one aspect of an otherwise volatile industry.

The **Promote and Develop American Fishery Products & Research Pertaining to American Fisheries Fund** receives 30 percent of the import duties the Department of Agriculture collects on fishery-related products. NOAA will use a portion of these funds to offset marine fishery resource programs in the Operations, Research and Facilities (ORF) appropriation in FY 2011. NOAA uses the remaining funds to promote industry development through competitively-awarded external grants for innovative research and development of projects in the fishing industry and for internal research that complements the external program.

The **Damage Assessment and Restoration Revolving Fund (DARRF)** receives proceeds from claims against responsible parties, as determined through court settlements or agreements, for damages to natural resources for which NOAA serves as trustee. In FY 1999 and prior years, NOAA transferred funds to the ORF account for purposes of damage assessment and restoration. Beginning in FY 2000, funds were expended in the DARRF and treated as mandatory budget authority.
NOAA utilizes funds transferred to this account to respond to hazardous materials spills in the coastal and marine environments, by conducting damage assessments, providing scientific support during litigation, and using recovered damages to restore injured resources.

	The **Federal Ship Financing Fund** manages the loan guarantee portfolio that existed prior to the enactment of the Federal Credit Reform Act of 1990. The **Limited Access System Administration Fund** was established by Title III of Public Law 104-297. Fee collections equaling no more than three percent of the proceeds from the sale or transfer of limited access system permits are deposited into the Fund. These deposits to the Fund are used to administer an exclusive central registry system for the limited access system permits. The **Environmental Improvement and Restoration Fund** was created by the Department of the Interior and Related Agencies Act, 1998, for the purpose of carrying out marine research activities in the North Pacific. These funds will provide grants to Federal, State, private or foreign organizations or individuals to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean. **Marine Mammal Unusual Mortality Event Fund** provides funds to support investigations and responses to unusual marine mammal mortality events. http://books.google.com (Book: The Costs of Managing Fisheries, 2003, By OECD, OECD - Organisation for Economic Co-operation and Development). http://www.fakr.noaa.gov/npfmc/current_issues/observer/observer.htm http://www.osec.doc.gov/bmi/budget/11BiB/NOAA%20ORF.pdf	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause	**Evidence**	
1.6.1	**Alaskan banks and financial institutions do not require pollock fishing vessels or fishing support vessels to be flagged in a jurisdiction other than Alaska where such a requirement would have the effect of increasing the likelihood of non-compliance with international conservation and management measures.** All vessels fishing in the US must be at least 75% US ownership (see also Jones Act). All AFA vessels must be US ownership vessels. No foreign fishing vessels are authorised to fish in Alaska. 50CFR679: www.fakr.noaa.gov/regs/default.htm	

Clause:		
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***		
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
1.7	**Procedures (through NPFMC and BOF public meetings) are in place to keep the efficacy of current conservation and management measures and their possible interactions under continuous review to revise or abolish them in the light of new information.** The pollock fishery is managed under the NPFMC's Groundfish Fishery Management Plans. NPFMC amends its FMPs as often as necessary; the most recent update is of 2010. Both the NPFMC, for federal waters, and the BOF, for State waters, have a "Call for Proposals" process where stakeholders and the interested public can request review or revision of existing management measures. MSA is periodically revised and reauthorized (i.e. Sustainable Fisheries Act added 3 standards to MSA). GOA Groundfish Fishery Management Plan (updated 10/10) – www.fakr.noaa.gov/npfmc/fmp/goa/goa.htm BSAI Groundfish Fishery Management Plan (updated 10/10) – www.fakr.noaa.gov/npfmc/fmp/bsai/bsai.htm http://www.fakr.noaa.gov/npfmc/public-meetings/meeting-calendar.html http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main	

Clause:
1.8 The management arrangements and decision making processes for the fishery shall be organized in a transparent manner. • **Management arrangements** • **Decision-making** ***FAO CCRF 7.1.9***
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
1.8	**The management arrangements and decision making processes for the fishery shall be organized in a transparent manner (NPFMC and BOF meetings).** NPFMC's management arrangements and decision making processes for the fishery are organized in a very transparent manner. The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites, including agenda of meetings, discussion papers, 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. Rules impose transparency so that all Board and Council members discussions are open to the public. No more than a predetermined number of Board or Council members can meet together unless the meeting is an open public meeting. www.fakr.noaa.gov/npfmc/default.htm www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main	

Clause:		
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***		
Evidence adequacy rating: **☑High** **☐ Medium** **☐ Low**		
Clause:	**Evidence**	
1.9	**The United States ratified the Agreement to Promote Compliance with International Conservation and Management Measures by Vessels Fishing in the High Seas on the 19 December 1995.** The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas ("Compliance Agreement") was adopted under the auspices of FAO, by FAO Conference Resolution 15/93 at the 27th Session of the FAO Conference in November 1993. It was adopted as part of FAO's work on the Code of Conduct for Responsible Fisheries and was formally integrated as part of the Code when that instrument was adopted in 1995 (see Article 1(1) of the Code of Conduct). Unlike the other parts of the Code, however, the Compliance Agreement is a legally binding treaty. It entered into force on 24 April 2003, after acceptance by 25 Parties. The United States ratified the 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. for details). http://www.oceanlaw.net/projects/current/pdf/ifa_sample.pdf http://www.fao.org/Legal/treaties/012s-e.htm http://www.fao.org/fishery/topic/14766/en	

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 10.1.1/10.1.2/10.1.4/10.2.1/10.2.2/10.2.4***					
Confidence Ratings	**Low**	**0 out of 16**	**Medium**	**0 out of 16**	**High**	**16 out of 16**

Clause:

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 the fragility of coastal ecosystems, the finite nature of their natural resources and the needs of coastal communities.

FAO CCRF 10.1.1

2.1.1 States shall develop, as appropriate, institutional and legal frameworks in order to determine the possible uses of coastal resources and to govern access to them taking into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development.

FAO CCRF 10.1.3

2.1.2 In setting policies for the management of coastal areas, States shall take due account of the risks and uncertainties involved.

FAO CCRF 10.2.3

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
2.1	**The NMFS in connection with the Council, as well as ADFG, managing the pollock resource off the Alaskan coast, participates in coastal area management-related institutional frameworks mainly through the federal National Environmental Policy Act (NEPA) processes.** This usually happens whenever resources under their management may be affected by other developments. In 1969, NEPA, or the National Environmental Policy Act, was one of the first laws ever written that established a broad U.S. framework for environmental protection. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that could significantly affect the environment.

	NEPA establishes the requirement that all federal agencies' funding or permitting decisions be made with full consideration of the impact to the natural and human environment. And it requires agencies disclose these impacts to interested parties and the general public. The central element in the environmental review process is a rigorous evaluation of alternatives including the "no action" alternative (http://www.epa.gov/region1/nepa/). Federal agencies, including the NPFMC, are responsible for producing NEPA documents each time they renew or amends regulations. Therefore, all of the NPFMC proposed regulations include NEPA considerations. NEPA, therefore, is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic consideration for the proposed changes. Every agency in the executive branch of the Federal Government has a responsibility to implement NEPA. In NEPA, Congress directed that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered 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." (http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf). The NEPA processes provide public information and a robust opportunity for public involvement. Decisions are made through public processes and involvement of fishery managers, fishermen, fishing organizations and fishing communities. Stakeholders are actively invited through publicly advertized and scheduled meetings. Prior to July 2011, Alaska also participated in the Alaska Coastal Management Plan, a process bringing together people and agencies (state and federal) for deciding among potential uses of the coastal zone. Despite the legislation voted off this program, the requirement for cooperation and between state and federal agencies is routine and extensive. Aside from the NEPA process, ANILCA and the OPMP provide an additional framework for cooperation in the integrated management of coastal resources. **ANILCA** The Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm). **OPMP** The Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. Because of the complexity and potential impact of these projects on multiple divisions or agencies, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. The office deals with a diverse mix of projects including transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/).

	In addition, the BOF and the NPFMC are openly public processes. Any individual or group can submit proposals for discussion of management and research for pollock fisheries in Alaska. The BOF meets in communities throughout coastal Alaska, while the NPFMC meets in communities in Alaska as well as in Washington and Oregon to provide public opportunities. Written comments are accepted when it is not possible to attend in person. http://www.fakr.noaa.gov/npfmc/ http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
2.1.1	**Alaska uses the NEPA processes in order to determine the possible uses of coastal resources and to govern access to them taking into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development.** In addition to the information provided in clause 2.1 regarding the NEPA process, the management organizations within Alaska and their processes take into account the rights of coastal fishing communities and their customary practices to the extent compatible with sustainable development. The beginning of such processes is clearly demonstrated by the Council and Board of Fisheries public decision making processes. **The BOF process.** The BOF main role is to conserve and develop the fishery resources of the state. The board is charged with making allocative decisions, and 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 the Alaska Department of Fish and Game, 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. Advisory committees are the local "grass roots" groups that meet to discuss fishing and wildlife issues and to provide recommendations to the boards. There are 82 committees throughout the state each with expertise in a particular local area. As authorized by Alaska Statute 16.05.260 which originally passed in 1959, the Joint Board of Fisheries and Game established 82 Advisory committees for the purpose of providing a local forum for the collection and expression of opinions and recommendations on matters related to the management of fish and wildlife resources. The regulations governing the advisory committee are 5 AAC Chapter 96 and 97. Meetings are always open to the public and are generally attended by department staff and members of the public who can offer background information on agenda topics. Advisory Committees are intended to provide a local forum on fish and wildlife issues. The BOF also takes reports

from each Advisory Committee on each set of issues, as well as staff reports, DOL, Enforcement and public and committee testimony (written and oral) before deliberation of each issue. Both the BOF and Council have all reports, testimony, debate and decisions in recorded, open public forum.

The NPFMC process. The Council system was designed so that fisheries management decisions were made at the regional level to allow input from affected stakeholders. Council meetings are open, and public testimony - both written and oral - is taken on each and every issue prior to deliberations and final decisions. Public comments are also taken at all Advisory Panel and Scientific and Statistical Committee meetings. While there is not a formal "call for proposals," interested stakeholders are welcome to draft letters to the Council.

Each Council decision is made by recorded vote in public forum after public comment. Final decisions then go to NMFS for a second review, public comment, and final approval. Decisions must conform with the MSA, the NEPA, Endangered Species Act, Marine Mammal Protection Act, and other applicable law including several executive orders. Regulatory changes may take up to a year or longer to implement, particularly if complex or contentious, but the Council makes every attempt in being open and transparent throughout the process. The Council meets five times each year, usually in February, April, June, October and December, with three of the meetings held in Anchorage, one in a fishing community in Alaska and one either in Portland or Seattle. Most Council meetings take seven days, with the AP and SSC usually following the same agenda and meeting two days earlier.

CDQs. The Community Development Quota (CDQ) Program began in December of 1992 with the goal of promoting fisheries related economic development in western Alaska. The program is a federal fisheries program that 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 allocated a portion of the Bering Sea and Aleutian Island harvest amounts to CDQ groups, including pollock, halibut, Pacific cod, crab and bycatch species. The CDQ program was granted perpetuity status during the 1996 reauthorization of the Magnuson-Stevens Act. The program was modelled after the Alaska Native Claims Settlement Act (ANCSA). However, the CDQ program was created with three primary differences:

- Community based shareholders instead of individual shareholders,
- Requirement that all investments be fisheries related.

The six CDQ groups are located throughout the western Alaska coastline and South towards the Aleutian islands, these are:

- Aleutian Pribilof Island Community Development Association (6 communities)
- Bristol Bay Economic Development Corporation (17 communities)
- Central Bering Sea Fishermen's Association (1 community)
- Coastal Villages Region Fund (20 communities)
- Norton Sound Economic Development Corporation (15 communities)
- Yukon Delta Fisheries Development Association (6 communities).

	A map of these communities is available at http://www.commerce.state.ak.us/bsc/CDQ/CDQmap.htm . The CDQ program has been successfully contributing to fisheries infrastructure in western Alaska by funding docks, harbors, and the construction of seafood processing facilities. The CDQ program has allowed CDQ groups to acquire equity ownership interests in the pollock, Pacific cod, and crab sectors which provide additional revenues to fund local in-region economic development projects, and education and training programs. http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main http://www.adfg.alaska.gov/index.cfm?adfg=process.advisory http://www.fakr.noaa.gov/npfmc/public-meetings/meeting-calendar.html http://www.dced.state.ak.us/bsc/cdq/cdq.htm
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
2.1.2	**In setting policies for the management of coastal areas, the fishery management organizations involved in the management of Alaska pollock take due account (through NEPA processes, NPFMC/BOF proceedings, ANILCA) of the risks and uncertainties involved.** Risks and uncertainties related to the policies set up for the management of coastal areas are taken into account within and throughout the various NEPA processes (risk based evaluation), NPFMC and BOF proceedings as well as through ANILCA and the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP). Please see previous Clauses in this section for further information.

Clause:		
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. ***FAO CCRF 10.1.2***		
Evidence adequacy rating: **☑High ☐ Medium ☐ Low**		
Clause:	**Evidence**	
2.2	**Representatives of the fisheries sector and fishing communities are consulted in the decision-making processes (NPFMC/BOF meetings) involved in other activities related to coastal area management planning and development (NEPA processes).** 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 NEPA processes, the NPFMC and BOF proceedings as well as through public review processes organized by the National Marine Fisheries Service. Please refer to previous Clauses in this section for further information and references.	

Clause:	
2.3 Fisheries practices that avoid conflict among fishers and other users of the coastal area shall be adopted. **2.3.1 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 users of the coastal area.** ***FAO CCRF 10.1.4, 10.15***	
Evidence adequacy rating: **☑High ☐ Medium ☐ Low**	
Clause:	**Evidence**
2.3	**Fisheries practices that avoid conflict among fishers and other users of the coastal area are adopted (AFA, CDQ, NPFC/BOF Meetings, NEPA).** The Council through AFA direction is responsible for allocation of the pollock resource among user groups (i.e. catcher; catcher-processor; motherships (processors only) etc.) in Alaska waters. Conflict among bottom users is avoided by dividing TAC allowances by

	area, season and user groups, by the public nature of the Council's decision making processes and so on. Specifically to pollock however, one of the best example is provided by the passage of the American Fisheries Act (AFA). AFA legislation created pollock allocation in Congress because the Council was having a difficult time implementing a pollock IFQ allocation. Once Congress made the allocation, then the NPFMC implemented those allocations as given in AFA. The AFA was signed into law in October 1998, with the purpose to tighten U.S. ownership standards for U.S. fishing vessels under the Anti-reflagging Act, and to provide the 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 eliminated the race for pollock through the establishment of cooperatives with specific provisions for their allocations, structure, and participation by catcher vessels and processing plants, as well as annual reporting requirements and excessive share limits. In response to a directive in the AFA, the Council added measures to protect other fisheries from adverse effects arising from the exclusive pollock allocation. Cooperative fishing began under the AFA program in 1999. The effects of AFA on the pollock industry were tremendous. Capacity was reduced, efficiency was increased, regulatory bycatch was reduced, a higher portion of the fish was utilized, and higher valued products were produced (http://www.fakr.noaa.gov/npfmc/catch-shares-allocation/afa-pollock-cooperatives.html). In addition, under AFA the CDQ Program's pollock allocation was increased to 10% of the annual TAC. This was done to achieve the goal that began in December of 1992 of promoting fisheries related economic development in western Alaska, allowing 65 communities within a fifty-mile radius of the Bering Sea coastline to participate in pollock fishing (http://www.dced.state.ak.us/bsc/cdq/cdq.htm). Further to these NPFMC/NMFS programs and regulations, the Council and the BOF offer a public forum for stakeholder involvement and conflict avoidance/resolution. Potential conflict between fishermen and other coastal users at the federal level are usually discussed and resolved at the NEPA Process level. NEPA is a federal act imposed on "federal activities". The Alaska Board of Fisheries is not legally bound to any requirements of the Act. Instead, ANILCA directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm). Moreover, the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. The office deals with a diverse mix of projects including transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/).

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
2.3.1	**Procedures and mechanisms are established at both administrative (through governmental agencies) and legal (through courts of law) legal to settle conflicts which arise within the fisheries sector and between fisheries resource users and other users of the coastal area.** The NEPA process, deliberately takes into account all resources and users of coastal resources in order to resolve potential conflicts among users before project approvals are given. Conflict resolution mechanisms include both administrative (through governmental agencies) and legal (through courts of law) procedures. However, in most cases project approvals are withheld until substantive conflicts are resolved. ADFG, NMFS and NPFMC will participate in the NEPA processes whenever resources under their management may be affected by other developments (http://www.epa.gov/aboutepa/states/ak.html).

Clause:

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

FAO CCRF 7.1.10

2.4.1 The public shall 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 10.2.1

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
2.4	**Conservation and management measures, laws, regulations and other legal rules governing their implementation are effectively disseminated. The bases and purposes of such measures are explained to users (through NPFMC/BOF, agencies websites meetings) of the resource in order to facilitate their application and thus gain increased support in the implementation of such measures.**

	The NPFMC and BOF public processes allow for fisheries stakeholders to become involved in all the decision making processes relative to the fishery resource in question. Many of these processes will result in regulation. Congress and the Alaska Legislature are responsible for legislation. The Secretary of Commerce and the Lieutenant Governor of Alaska sign respectively NPFMC and BOF decisions into law. Fisheries stakeholders involvement in the NPFMC and BOF process is thus the first level of "publicity" towards fishery conservation and management measures. Secondly, these agencies provide all the information and regulations related to the fisheries under their management on their websites, and/or where necessary provide radio updates (i.e. notice of closure of fishery). Fishery users are thus educated about conservation and management measures by simple virtue of involvement and by the public nature of the management system, starting from decision making to the final stages of law/regulation publication. Stakeholders involvement allows for facilitation in application and support in the implementation of fisheries management measures.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
2.4.1	**The public is kept aware (NPR) on the need for the protection and management of coastal resources and the participation in the management process by those affected.** National Public Radio is the main source as information for Alaska fisherman (http://www.npr.org/). All fishery report passes out through NPR and keep informed fishermen of development as they are implemented. In addition to local radio, the internet (NMFS and ADFG websites), and printed news releases and Emergency Orders (available at local harbourmaster's offices, marine supply outlets, etc) are also important sources of public information. The Marine Conservation Alliance (MCA) has a website that give links to all of the various State, federal plans and proposals, Industry and USCG information (http://www.marineconservationalliance.org/). NPR and MCA are widely used by industry and the communities. While NMFS Office for Law Enforcement (OLE) is tasked with enforcing the laws and regulations that serve to protect our nation's living marine resources, continuous education of the American public and ocean resource users is key in protection and conservation. OLE special agents, enforcement officers and support personnel routinely make presentations to school, scout and civic groups. These presentations cover a vast array of subjects within enforcement and conservation. Marine mammal protection, endangered species, sustainable fisheries, vessel monitoring systems, new Federal fishing regulations, and proper stranding procedures are just a few of the topics that they address. Special agents and enforcement officers are engaged in their communities and can be solicited directly through the local field office (http://www.nmfs.noaa.gov/pr/education/).	

	NOAA's NMFS Protected Resources Outreach and Education Plan of 2006 strives to give direction to the myriad efforts currently underway across the NMFS Protected Resources (PR) regional and headquarters offices and NMFS science centers. This plan incorporates visions and mandates from NOAA, NMFS, and PR into an outline and plan of action addressing outreach and education for the next three to five years. Workshop participants identified challenges to outreach and education, most effectively addressed at a national level, which form the basis of the Outreach and Education plan. In all NMFS/PR offices and at NMFS science centers, outreach and education activities are successfully underway. The work is carried out by full time outreach specialists, program staff with partial outreach responsibilities, and by interested staff who integrate outreach and education into their regular duties. Outreach and education will improve the public's perspective of Protected Resource's programs by increasing the public's knowledge of the status of species, threats to their continued survival, and how NMFS science and management are working to address. (http://www.nmfs.noaa.gov/pr/pdfs/education/strategic_plan.pdf). Another important state effort requested by the US Congress is the development of a wildlife action plan, known technically as a Comprehensive Wildlife Conservation Strategy (CWCS). The intent of the CWCS is to initiate or expand partnerships with other agencies and non-governmental organizations (NGO's) to conserve, improve, and manage Alaska's habitats for aquatic species, develop education and outreach programs and materials related to aquatic species and their habitats, and to develop curricula and supporting material that describes the relationship between aquatic species, sport-fished species, and the importance of aquatic habitats by providing targeted audiences with educational programs that focus on aquatic resource-based stewardship principles and encourage active stewardship practices. In 2003, at the start of the CWCS project, in order to get broad input on process, goals, and species with conservation needs, the planning team reached out to a range of partners including government agencies, conservation interests, landowners, resource users, representatives of the Native community, and the state's 77 ADFG advisory committees, as well as to the general public. This was followed by two-day meetings and months of work with more than 100 scientific experts, peers, and others with Alaskan expertise on species and habitats in 14 major animal groups. The planning team provided an eight week window in which to review the draft CWCS, announcing the opportunity via email or letter to nearly 2,000 individuals and groups, and notice to the general public through a press release, newsletters, Alaska's CWCS website, and a notice published in major instate newspapers. The team considered hundreds of comments received from universities, government agencies, and organizations including The Wildlife Society, Tanana Tribal Council, National Rifle Association, Territorial Sportsmen, Defenders of Wildlife, and Alaska Bird Observatory. http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/alaska.pdf http://www.adfg.alaska.gov/static/species/wildlife_action_plan/cwcs_main_text_combined.pdf Please see also Clause 2.4 as well as previous clauses in this Section.	

Clause:	
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.** • **Economic assessment** • **Social and cultural assessment** ***FAO CCRF 10.2.2***
Evidence adequacy rating:	
☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
2.5	**The economic, social and cultural value of coastal resources is assessed by the management organizations in question in order to assist decision-making on their allocation and use.** The primary job of the NPFMC and the BOF is allocation of resources to different users. To do so, they use biological and socio-economic information collected and analyzed by the NMFS and the ADFG. The NPFMC, NMFS and ADFG all have staff economists that participate in the economic, social and cultural evaluation and review process of fishery management proposals. They advise the NPFMC and BOF members, as well as their agency heads who help lead the regulation amendment process. Secondarily, on a higher level, the NEPA process has the same requirements as the biological and socio-economic aspects of the fishery must be taken into account before such decision can occur. An example recent large scale socio-economic and cultural assessment of the Alaskan fishery users was started in 2005 by the Alaska Fishery Science Center (AFSC). In that year, the AFSC compiled baseline socioeconomic information about the 136 Alaska communities most involved in commercial fisheries. Communities were selected by assessing fishery-involvement indicators including landings, processors, vessel homeports, vessel ownership, crew licenses, and gear operator permits. The profiles compiled information from the US Census, ADFG, CFEC, NMFS Restricted Access Management Division, Alaska Department of Community and Economic Development, and various community groups, websites, and archives. The 5-page profiles for each community follow the same general outline: • People and Place (Location, Demographics, History). • Infrastructure (Current Economy, Governance, Facilities). • North Pacific Fisheries involvement (Commercial, Recreational, Subsistence Fishing).

	The profiles were published as NOAA Technical Memorandum NMFS-AFSC-160 in December 2005. The report can be downloaded as a complete document (17.6 MB) from http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-160/NOAA-TM-AFSC-160.pdf. The AFSC is planning to update the Alaskan community profiles to include new U.S. Census data from 2010 and input from the communities and industry. The Economic status of the groundfish fisheries off the GOA and BSAI area can be found at http://www.afsc.noaa.gov/ REFM/docs/2010/economic.pdf. These reports are published yearly along the Ecosystem SAFEs and the various fishery Stock Assessment and Resource Evaluation (SAFE) reports. The Alaska Fisheries Information Network (AKFIN) was established in 1997 under the direction of the Pacific States Marine Fisheries Commission (PSMFC) to consolidate, manage and dispense information related to Alaska's commercial fisheries. AFKIN was founded in response to an increased need for detailed, organized fishery information to help in making management decisions with a mission to maintain an analytic database of both state and federal historic, commercial Alaska fisheries data relevant to the needs of fisheries analysts and economists and to provide that data in a usable format. http://www.akfin.org/about-akfin

Clause: **2.6 In accordance with capacities, measures shall be taken to establish or promote systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters.** ***FAO CCRF 10.2.4, 10.2.5*** **2.6.1 States shall promote multidisciplinary research in support and improvement of coastal area management, in particular on its environmental, biological, economic, social, legal and institutional aspects.** ***FAO CCRF 10.2.5***	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
2.6	**In accordance with capacities, measures are taken to establish or promote systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters. This is done by a wide variety of State and federal agencies.**

	Monitoring of the coastal environment in Alaska is performed by federal and state agencies including the U.S. Forest Service, U.S. Fish and Wildlife Service, and the NMFS, ADFG as well as many institutions of higher learning [such as the University of Alaska Institute of Marine Science (IMS)]. IMS faculty and research staff provides expertise in marine biology, biological oceanography, physical, chemical and geological oceanography. With an annual research budget of approximately $5.5 million, current IMS projects include Northeast Pacific near-surface monitoring of temperature, salinity and fluorescence, polycyclic aromatic hydrocarbon research, and Arctic ocean biodiversity. (http://www.ims.uaf.edu/) Economic and social parameters are assessed by the staff of the NPFMC, NMFS and ADFG either during the NEPA review of plan amendments or during their on-going studies and evaluations. For Oceanography, the North Pacific Research Board (NPRB) has funded million of dollars for numerous studies describing baseline oceanographic parameters and supported environmental buoy arrays (http://www.nprb.org). NPRB also have funded major ecosystem studies (currently ongoing) in the GOA and BSAI worth 10's of millions of US$ (see GOAIERP and BSIERP). Additionally, NMFS Pacific Marine Environmental Lab (PMEL) regularly collects oceanographic and environmental data which is important to understanding the changing habitat of pollock and other marine species. (http://www.pmel.noaa.gov) **ADEC** The Alaska Department of Environmental Conservation (ADEC) Division of Water establishes standards for water cleanliness; regulates discharges to waters and wetlands; provides financial assistance for water and wastewater facility construction, and water body assessment and remediation; trains, certifies and assists water and wastewater system operators; and monitors and reports on water quality (http://dec.alaska.gov/water/MoreAboutWater.htm). ADEC Division of Spill Prevention and Response prevents spills of oil and hazardous substances, prepares for when a spill occurs and responds rapidly to protect human health and the environment (http://dec.alaska.gov/spar/index.htm). **ADFG** ADFG Habitat Division conducts research on watersheds, active mining sites, fire-impacted woodlands, anadromous fish streams, and coastal and marine environments throughout Alaska in an effort to document and mitigate human-related impacts, changes in habitat & species abundance (http://www.adfg.alaska.gov/index.cfm?adfg=habitatresearch. main). **AFSC** The AFSC's *"Ecosystem Monitoring and Assessment Program"* (EMA) main goal is to improve and reduce uncertainty in stock assessment models of commercially important fish species through the collection of observations of fish and oceanography. Fishery observers and survey scientists collect information regarding fish abundance, size, distribution, diet and energetic status. Oceanographic observations include temperature, conductivity, salinity, density, light transmission, photosynthetically available radiation (PAR), oxygen, Chlorophyll a, and estimates of the composition and biomass of phytoplankton and zooplankton (includes jellyfish) species. These fish and oceanographic observations are used to connect climate change and variability in large marine ecosystems to early marine survival of commercially important fish species in the GOA, Bering Sea, and Arctic.

	The oceanographic component of EMA investigates various physical and biological parameters in the eastern Bering Sea. Spatial and temporal patterns illustrated by these data provide critical insight into how the ecosystem functions. Oceanographic data is analyzed alone and in conjunction with fisheries data for comparisons of water mass characteristics. Water samples collected above and below the pycnocline are analyzed for Chlorophyll a concentration to explore productivity and are used in primary production experiments to explore growth rates. Phytoplankton forms the base of the food web and perform a critical role in the Bering Sea ecosystem. Zooplankton and jellyfish are collected for species ID, biomass, and abundance. Zooplankton are an important prey item of numerous Bering Sea fishes including forage fishes and the juvenile stages of many commercially important species. Understanding the links among phytoplankton, zooplankton, and fishes will further AFSC's understanding changes in populations of fisheries stocks and the influence of climate change in this region (http://www.afsc.noaa.gov/ABL/EMA/EMA_Oceanography.php). In 2005, the AFSC also compiled baseline socioeconomic information about the 136 Alaska communities most involved in commercial fisheries. Their plan is now to update with 2010 information. Please see previous clause for more details. **NMFS** The NMFS' Habitat Conservation Division (HCD) works in coordination with industries, stakeholder groups, government agencies, and private citizens to avoid, minimize, or offset the adverse effects of human activities on Essential Fish Habitat (EFH) and living marine resources in Alaska. This work includes conducting and/or reviewing environmental analyses for a large variety of activities ranging from commercial fishing to coastal development to large transportation and energy projects. HCD identifies technically and economically feasible alternatives and offers realistic recommendations for the conservation of valuable living marine resources. HCD focuses on activities in habitats used by federally managed fish species located offshore, nearshore, in estuaries, and in freshwater areas (http://www.fakr.noaa.gov/habitat/default.htm). **USCG** Protecting the U.S. EEZ and key areas of the high seas is an important mission for the US Coast Guard. The Coast Guard enforces fisheries laws at sea, both domestic and international fishing agreements as tasked by the MSA. Furthermore, the goal of the USCG's marine protected species program is to assist the NMFS and the FWS in the development and enforcement of those regulations necessary to help recover and maintain the country's marine protected species and their marine ecosystems. Coast Guard objectives include assisting in preventing the decline of marine protected species populations, promoting the recovery of marine protected species and their habitats, partnering with other agencies and organizations to enhance stewardship of marine ecosystems and ensuring internal compliance with appropriate legislation, regulations and management practices (http:// www.uscg.mil/hq/cg5/cg531/LMR.asp). **RAM** The NMFS Alaska Regional Office's Restricted Access Management Program (RAM) is responsible for managing Alaska Region permit programs, including those that limit access to the Federally-managed fisheries of the North Pacific. RAM prepares and distributes reports on landings in the pollock fishery as well as all other federal fisheries

	(http://www.fakr. noaa.gov/ram/). **AFKIN.** The Alaska Fisheries Information Network (AKFIN) was established in 1997 under the direction of the Pacific States Marine Fisheries Commission (PSMFC) to consolidate, manage and dispense information related to Alaska's commercial fisheries. AFKIN was founded in response to an increased need for detailed, organized fishery information to help in making management decisions with a mission to maintain an analytic database of both state and federal historic, commercial Alaska fisheries data relevant to the needs of fisheries analysts and economists and to provide that data in a usable format. http://www.akfin.org/about-akfin **ANILCA** In addition, the Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm). **OPMP** Moreover, the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. Because of the complexity and potential impact of these projects on multiple divisions or agencies, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. The office deals with a diverse mix of projects including transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/).
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
2.6.1	**The pollock management organizations in Alaska promote multidisciplinary research in support and improvement of coastal area management, in particular on its environmental, biological, economic, social, legal and institutional aspects.** The agencies reported above (in clause 2.6) and their efforts are continuously aimed at improving the management of the coastal areas of Alaska. Environmental, biological, economic, social, legal and institutional aspects of the coastal zone are routinely researched, many times using a multidisciplinary approach. Please see clause 2.6 for some examples.

Clause:	
2.7	**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 10.3.2***

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
2.7	**In the case of activities (Oil spill, other cargos) that may have an adverse transboundary environmental effect on coastal areas, States provide timely information and, wherever possible, prior notification and consultation to potentially affected States.** One activity that may have adverse transboundary environmental effect on coastal areas is oil transport and the related risks of oil spills. The Pacific States/British Columbia Oil Spill Task Force was authorized by a Memorandum of Cooperation signed in 1989 by the Governors of Alaska, Washington, Oregon, and California and the Premier of British Columbia following the Nestucca and Exxon Valdez oil spills. These events highlighted their common concerns regarding oil spill risks and the need for cooperation across shared borders. In June 2001 a revised Memorandum of Cooperation was adopted. The Memorandum of Cooperation outlined improved trans-boundary response and information sharing. The Pacific States/British Columbia Task Force provides on an annual basis, reports to member jurisdictions on individual activities that may be of mutual benefit in oil spill preparedness, prevention and response. Similarly, U.S. and Russia joined efforts on 22nd 2003 to create a landmark oil spill prevention and response plan. The agreement paved the way for the U.S. and Russia to share technology and prepare joint prevention and response plans to reduce the risk of oil spills and resultant environmental damage. In addition to oil spills, other "cargo" being transported through the area may have significant environmental risks. Other environmental impacts may result from untreated ballast water discharge (introduction of Aquatic Nuisance Species, see http://www.pwsrcac.org/projects/nis/studies.html), rats (on some Aleutian Islands, unchecked predation on birds, see http://www.stoprats.org/wildlife.htm and http://www.pnas.org/content/105/10/3800.long) or other hazardous cargo (http://www.dec.state.ak.us/spar/perp/docs/hmrt_feb05.pdf). Any of such issues threatening adverse transboundary environmental effect are dealt through governmental, ENGOs and the Media channels. http://news.heartland.org/newspaper-article/2003/11/21/us-russia-create-oil-spill-prevention-and-response-plan ; http://www.oilspilltaskforce.org/ .	

Clause:
2.8 States shall cooperate at the sub-regional and regional level in order to improve coastal area management.   ***FAO CCRF 10.3.3***
Evidence adequacy rating: **☑High ☐ Medium ☐ Low**

Clause:	Evidence	
2.8	**Alaska's fishery's management organizations cooperate at the sub-regional and regional level (Joint Protocol NPFMC-ADFG) in order to improve coastal area management.** The pollock fishery in Alaska is managed by federal (NPFMC/NMFS) and State agencies (ADFG/BOF). These management organizations treat the whole State of Alaska as a singular management unit with the difference that state managers have jurisdiction from shore to 3 nm and federal managers from 3-200 nm. There is intimate, routine and compatible collaboration between state and federal management. This is highlighted by the Joint Protocol of 1997 between the NPFMC and ADFG which intent is to provide long term cooperative, compatible management systems that maintain the sustainability of the fisheries resources in State and Federal waters. On September 15th 1999, an Addendum to the Joint Protocol and State/Federal Action plan, to specify further cooperation, was assigned by NPFMC and ADFG representatives. In addition, the federal agencies tasked with management of the pollock resource, participate in the NEPA processes whenever resources under their management may be affected by other developments. The NEPA processes seek and include extensive stakeholder participation. The Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and coordinate with the state of Alaska. Moreover, the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.findings http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/findings/ff97170a.pdf http://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/pdfs/findings/ff99183x.pdf http://dnr.alaska.gov/commis/opmp/ http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm	

Clause:

2.9 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

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
2.9	**Alaska has established mechanisms (i.e. NEPA process, ANILCA) for cooperation and coordination among national authorities involved in planning, development, conservation and management of coastal areas.** Alaska has established mechanisms for cooperation and coordination among national authorities involved in planning, development, conservation and management of coastal areas. The NMFS in connection with the Council managing the pollock resource off the Alaskan coast, participates in coastal area management-related institutional frameworks through the federal National Environmental Policy Act (NEPA) processes. This usually happens whenever resources under their management may be affected by other developments. Federal agencies, including the NPFMC, are responsible for producing NEPA documents each time they renew or amends regulations. Therefore, all of the NPFMC proposed regulations include NEPA considerations. NEPA, therefore, is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic sphere of fisheries. Every agency in the executive branch of the Federal Government has a responsibility to implement NEPA. In NEPA, Congress directed that, to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered 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." (http://ceq.hss.doe.gov/nepa/Citizens_Guide_Dec07.pdf). Stakeholders are actively invited through publicly advertized and scheduled meetings. The Alaska National Interest Lands Conservation Act (ANILCA) directs federal agencies to consult and coordinate with the state of Alaska. State agencies responsible for natural resources, tourism, and transportation work as a team to provide input throughout federal planning processes (http://dnr.alaska.gov/commis/opmp/anilca/anilca.htm).	

	Moreover, the Department of Natural Resources (DNR) Office of Project Management and Permitting (OPMP) coordinates the review of larger scale projects in the state. Because of the complexity and potential impact of these projects on multiple divisions or agencies, these projects typically benefit from a single primary point of contact. A project coordinator is assigned to each project in order to facilitate interagency coordination and a cooperative working relationship with the project proponent. The office deals with a diverse mix of projects including the Aleutian Island Ecosystem Plan, transportation, oil and gas, mining, federal grants, ANILCA coordination, and land use planning. Every project is different and involves a different mix of agencies, permitting requirements, statutory responsibilities, and resource management responsibilities (http://dnr.alaska.gov/commis/opmp/). One result of intensive state and federal coordination was the Council developed Aleutian Islands Fishery Ecosystem Plan (AI FEP). The AI FEP is a strategic policy and planning document, to guide the Council in its management actions relating to the Aleutian Islands. The Aleutian Island ecosystem is complex, and is the least predictable of the ecosystems in which the Council manages. The FEP is intended to be an educational tool and resource that can provide the Council with both an 'early warning system,' and an ecosystem context for fishery management decisions affecting the Aleutian Islands area. This plan should help the Council respond to changing conditions in a proactive rather than reactive mode (http://www.fakr.noaa.gov/npfmc/conservation-issues/aifep.html).	

Clause:

2.10 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 10.4.2

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
2.10	**The authorities representing the fisheries sector in Alaska's coastal management process have the appropriate technical capacities and financial resources.** The federal and State agencies involved in the management of pollock resources in the waters off Alaska have the appropriate technical capacity and financial	

	resources to carry out their mandates. Please see a discussion about the financing of fisheries in clause 1.6. The technical capacities of these agencies are covered by internationally recognized scientists, seasoned fishery managers, policy makers and so on, which in most cases devote their entire career to the agency they work for and the resource they are trying to manage.	

Clause:

2.11 States and fisheries management organizations and arrangements shall regulate fishing in such a way as to avoid the risk of conflict among fishers using different vessels, gear and fishing methods.

FAO CCRF 7.6.5

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
2.11	**Fishing in regulated in such a way as to avoid the risk of conflict among fishers using different vessels, gear and fishing methods (i.e. AFA allocation, seasons).** In the BSAI and the GOA, for both state and federal waters, pollock is caught using pelagic trawl gear only. Many years ago the Council eliminated all other gear types for directed pollock fishing. The AFA allocation and the B-Season restrictions on the CVOA have further reduced user conflict. Thus, the implementation of the AFA allowed only one gear. A detailed discussion of this topic is provided in Clause 2.3 of this Section.	

3. Management objectives shall be implemented through management rules and actions formulated in a plan or other framework. *FAO CCRF 7.3.3/7.2.2*						
Confidence Ratings	**Low**	**0 out of 6**	**Medium**	**0 out of 6**	**High**	**6 out of 6**

Clause:

3.1 Long-term management objectives shall be translated into a plan or other management document and be subscribed to by all interested parties.

FAO CCRF 7.3.3
ECO 28.1

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
3.1	**Long-term management objectives are translated into a plan or other management document and be subscribed to by all interested parties (MSA, Groundfish FMP).** Under the MSA, the NPFMC 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 FMPs for pollock fisheries in the GOA and the BSAI**. Both FMPs present long-term management objectives for the Alaska pollock fishery. These include sections that describe a Summary of Management Measures and Management and Policy Objectives. **National Standards for Fishery Conservation and Management** The MSA, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. They are: 1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States 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 United States fishermen, such allocation shall be A) fair and equitable to all such fishermen; B) reasonably calculated to promote conservation; and C) carried out in such manner that no particular individual, corporation, or entity acquires an excessive share of such 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 this 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.

10. Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Management Objectives
Under the direction of the NPFMC, the GOA and BSAI FMPs define nine management and policy objectives that are reviewed annually. They are:

- Prevent Overfishing
- Promote Sustainable Fisheries and Communities
- Preserve Food Webs
- Manage Incidental Catch and Reduce Bycatch and Waste
- Avoid Impacts to Seabirds and Marine Mammals
- Reduce and Avoid Impacts to Habitat
- Promote Equitable and Efficient Use of Fishery Resources
- Increase Alaska Native Consultation
- Improve Data Quality, Monitoring and Enforcement

The national standards and management objectives defined in GOA and BSAI FMPs provide adequate evidence to demonstrate the existence of long-term objectives clearly stated in management plans. They provide more detailed evidence for additional clauses in this section.

The Sustainable Fisheries Act (SFA)

The Sustainable Fisheries Act (SFA) substantially amended the MSA in 1996. Among other things, the SFA placed increased emphasis on ending overfishing and rebuilding overfished stocks. The SFA also added three new national standards to the seven existing standards in the MSA to focus attention on specific areas of concern – impacts of management actions on fishing communities, bycatch reduction, and safety at sea.

The ten national standards are statutory criteria with which all FMPs and amendments prepared by the Council and the Secretary of Commerce must comply. Existing standards require, among other things, that overfishing is prevented, that best scientific information be used, and that efficiency be considered in selecting management measures. The SFA required that FMPs be amended within two years to incorporate the new changes. In addition, the SFA requires that a report to Congress on the status of stocks be prepared each year.

PWS State pollock fishery

For the PWS State pollock fishery, "5 AAC 28.263. Prince William Sound Pollock Pelagic Trawl Management Plan" sets the regulation for the directed state pollock fishery. Originally, in the pollock state fishery of 2000, the BOF established an emergency regulation which established the PWS management plan, primarily as a means to increase protection of endangered Stellar Sea lions. The plan, subsequently adopted by the BOF, provided for the directed fishery to be apportioned among three sections of the inside district (-1 Bainbridge Section, -2 Knight Island Section, and -3 Hinchinbrook Section), with no more than 40% of the guideline harvest level taken in any one section.

The commissioner's permit provided ADFG some annual flexibility to meet inseason management needs and was used to specify check-in and check-out requirements, catch reporting procedures, logbooks, and accommodation of a department observer if requested. The same management plan, established that during a directed pollock pelagic trawl fishery, the total bycatch weight of all species combined may not exceed five percent of the total round weight of the pollock harvested.

http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html
http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html
http://touchngo.com/lglcntr/akstats/aac/title05/chapter028/section263.htm

Clause:

3.2 Management measures shall provide inter alia that:

3.2.1 Excess fishing capacity is avoided and exploitation of the stocks remains economically viable;

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

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

3.2.4 Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected;

3.2.5 Depleted stocks are allowed to recover or, where appropriate, are actively restored;

FAO CCRF 7.2.2

ECO 28.2

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
3.2.1	**Excess fishing capacity is avoided (LLP, AFA) and exploitation of the stocks remains economically viable.** In the GOA, in 1996, a moratorium on entry of new vessels into the groundfish fishery was implemented. The large number of vessels fishing for a limited resource had created a “race for fish,” characterized by short seasons and economic inefficiency. The intent of the moratorium was to prevent these problems from worsening while comprehensive solutions were being developed. The eligibility period for moratorium qualification was January 1, 1988 through February 9, 1992, during which time a vessel shall have made at least one legal landing of groundfish. In June 1995, the Council adopted a license limitation program (LLP) to supersede the vessel moratorium. The LLP is the first step in fulfilling the Council’s commitment to develop a comprehensive rationalization program for the Alaska groundfish and crab fleet. The LLP would limit the number, size, and specific operation of vessels that may be used in fisheries for groundfish, other than demersal shelf rockfish east of 140 deg. W. long. and sablefish managed under the Individual Fishing Quota (IFQ) program for Pacific halibut and sablefish, in the EEZ off Alaska. Licenses would be issued to eligible applicants based on fishing that occurred from a qualifying vessel in endorsement areas in BSAI, GOA, or BSAI/GOA management areas during the general qualification period. Licenses would be issued to either catcher vessel or catcher/processor vessel categories. Minimum landings requirements vary according to vessel length category, the area, and vessel length designation. The LLP was approved by the Secretary in September 1997.

As of January 1, 2000 a Federal LLP license is required for vessels participating in directed fishing for LLP groundfish species in the GOA or BSAI, or fishing in any BSAI LLP crab fisheries. A vessel must be named on an original LLP license that is onboard the vessel. The LLP license requirement is in addition to all other permits or licenses required by federal regulations. The LLP is a Federal program and LLP licenses are not required for participation in fisheries that occur in the waters of the State of Alaska.

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

There are four exceptions to the LLP license requirement:

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

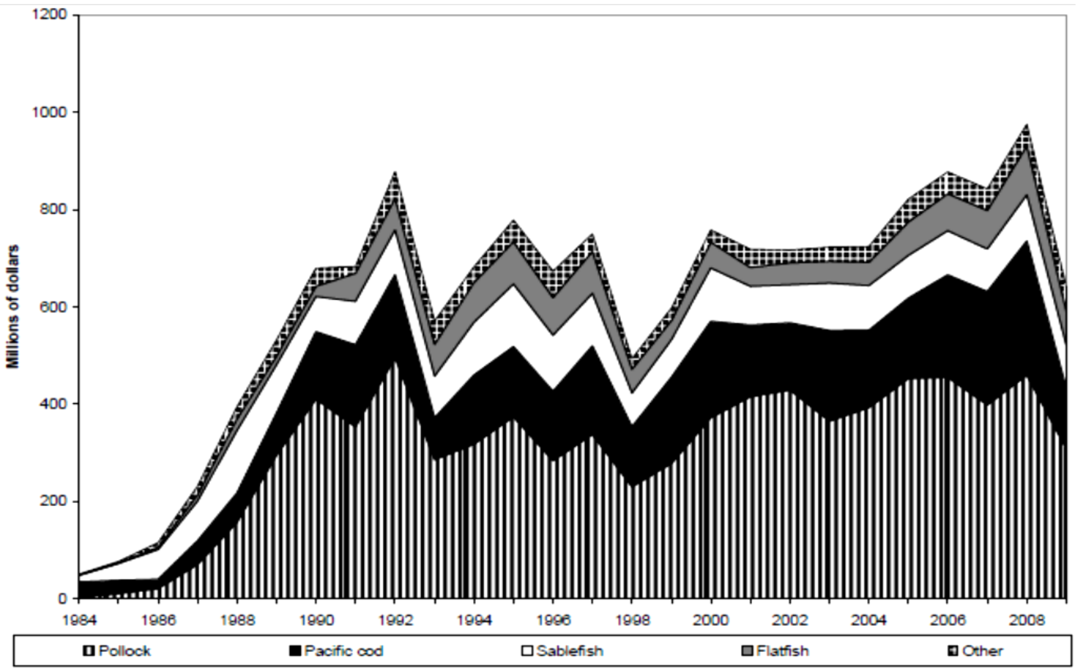
Until 1998, the Bering Sea directed pollock fishery had been a managed open access fishery, commonly characterized as a “race for fish.” In 1998, however, Congress enacted the AFA to rationalize the fishery by limiting participation and allocating specific percentages of the Bering Sea directed pollock fishery TAC among the competing sectors of the fishery. After first deducting 10 percent of the TAC for the CDQ program and an incidental catch allowance, the AFA allocates 50 percent of the remaining TAC to the inshore catcher vessels sector; 40 percent to the catcher processor sector; and 10 percent to the mothership sector.

The AFA also allowed for the development of pollock industry cooperatives. Ten such cooperatives were developed as a result of the AFA: seven inshore co-ops, two offshore co-ops, and one mothership co-op. The first cooperative was formed in 1999 by a private-sector initiative, Pollock Conservation Cooperative (PCC), and is made up of nine catcher/processor companies that divide the sector’s overall quota allowance among the companies.

In rationalizing the Bering Sea pollock fishery, the AFA also gave the industry the ability to respond more deliberately and efficiently to market demands than the “race for fish” previously allowed. The AFA also gave the fishery the means to compensate for Steller sea lion conservation measures that, beginning in 1992, created fishery exclusion zones around sea lion rookeries and haulout sites and implemented gradual reductions in seasonal proportions of the TAC taken in Steller sea lion critical habitat.

As of January 1, 2000, all vessels and processors wishing to participate in the non-CDQ Bering Sea pollock fishery are required to have valid AFA permits on board the vessel or at the processing plant. AFA permits are required even for vessels and processors specifically named in the AFA, and are required in addition to any other Federal or State permits.

	AFA permits also may limit the take of non-pollock groundfish, crab, and prohibited species, as governed by AFA "sideboard" provisions. With the exceptions of applications for inshore vessel cooperatives and for replacement vessels, the AFA permit Program had a one-time application deadline of December 1, 2000, for AFA vessel and processor permits. Applications for AFA vessel or processor permits were not accepted after this date, and any vessels or processors for which an application had not been received by this date became permanently ineligible to receive AFA permits. The effects of AFA on the pollock industry were very significant. Capacity was reduced, efficiency was increased, regulatory bycatch was reduced, a higher portion of the fish was utilized, and higher valued products were produced. The state PWS fishery is limited in the number of vessels that target pollock. In 2009 the harvest was landed by 8 vessels, in 2010 by 11 vessels and in 2011 by 7 vessels. Both the BSAI and the GOA (federal and state) fisheries are deemed to be economically viable. Please see next clause for a figure of the economic value of the pollock fishery. http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOASummary.pdf http://www.fakr.noaa.gov/npfmc/catch-shares-allocation/afa-pollock-cooperatives.html http://www.fakr.noaa.gov/ram/llp.htm	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
3.2.2	**The economic conditions (profitable and stable) under which the pollock fishery industry operates promote responsible fisheries.** The Alaskan pollock fishery is a very tightly managed fishery and also a fishery that has largely remained economically stable since the 1990s. The following figure (from the December 2010 Economic SAFE) shows real ex-vessel value of the groundfish catch in the domestic commercial fisheries off Alaska by species, 1984-2009 (base year = 2009). The estimates are for catch from both federal and state of Alaska fisheries.	



One example of how the economic conditions of the Alaskan commercial pollock fisheries promote responsible fisheries is provided by the use of voluntary rolling hotspots (avoidance of salmon bycatch hotspots) from the BSAI pollock commercial fishermen, to avoid early fishery closure due to salmon bycatch.

On this topic, at the June 2011 meeting, the Council held its first initial review on an analysis evaluation proposed management measures to minimize non-Chinook salmon bycatch in the Bering Sea pollock fishery. The proposed measures include hard caps on the pollock fishery, triggered time and area closures, and participation in the Rolling Hotspot (RHS) Program.

http://www.afsc.noaa.gov/REFM/docs/2010/economic.pdf
http://www.fakr.noaa.gov/npfmc/PDFdocuments/bycatch/ChumRIR511.pdf

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
3.2.3	**The interests of fishers, including those engaged in subsistence, small-scale and artisanal fisheries are taken into account (i.e. set as objective in FMPs).** 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 (please see FMPs for further details).

Also, the CDQ Program, worth 10% of the BSAI pollock TAC allowance, addresses the fishery dependence of coastal and western Alaska communities and 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 coastal communities to participate in the regional commercial fisheries, or residents themselves have fished the CDQ.

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 by using Prohibited Species Catch (PSC) limits and by virtue of other programs (i.e. Rolling Hotspot). The NPFMC and the industry alike are taking drastic measures to reduce non - Chinook and Chinook salmon bycatch (critically important for subsistence and small scale fisherman in Alaska) in the pollock fisheries.

State subsistence management and the importance of salmon

The State of Alaska manages subsistence, sport/recreational (used interchangeably), commercial, and personal use harvest on lands and waters throughout Alaska. ADFG is responsible for managing subsistence, commercial, sport, and personal use salmon fisheries. The first priority for management is to meet spawning escapement goals in order to sustain salmon resources for future generations. The highest priority use is for subsistence under both state and federal law. Salmon surplus above escapement needs and subsistence uses are made available for other uses. The Alaska BOF adopts regulations through a public process to conserve and allocate fisheries resources to various user groups. Subsistence fisheries management includes coordination with the Federal Subsistence Board and Office of Subsistence Management, which also manages subsistence uses by rural residents on federal lands and applicable waters under Title VIII of the Alaska National Interest Lands Conservation Act (ANILCA). Yukon River salmon fisheries management includes obligations under an international treaty with Canada. Salmon fisheries management in southeast Alaska also includes international obligations under the Pacific Salmon Treaty.

ADFG, Division of Subsistence, estimates that approximately 43.7 million pounds of wild foods are harvested annually by residents of rural Alaska, representing on average 375 usable pounds per person. Communities throughout the various regions of rural Alaska rely upon various resources, based upon resource availability and customary and traditional resource use patterns. For example, Wolfe (2000) documented 92% to 100% of the rural households in Arctic, Interior, Western, and Southwestern Alaska use fish, while only 75% to 86% of households actually harvest fish, which testifies to the importance of sharing within subsistence-based economies. Similarly, based upon an analysis of comprehensive data on wild resource harvests from the 1980s and 1990s, ADFG found that on average, fish (mostly salmon) represent 60% of the total subsistence harvests by rural residents, followed by land mammals (20%), marine mammals (14%), birds, shellfish, and plants (each 2%).

Voluntary Rolling Hotspot System

Amendment 84 to the BSAI FMP provides for the pollock cooperatives to enter into voluntary, contractual agreements for reducing salmon PSC by the pollock fleet. These InterCooperative Agreements (ICAs) exempt participating non-CDQ and CDQ pollock vessels from closures of the Chinook and Chum Salmon Savings Areas in the Bering Sea and allow those vessels to use real-time salmon PSC information to avoid high incidental catch rates of non-Chinook and Chinook salmon.

All parties to the ICA agree to abide by all tenets of the ICA, which provides for retaining the services of a private contractor to gather and analyze data, monitor the fleet, and report necessary PSC information to the parties of the ICA. The ICA requires that the PSC rate of a participating cooperative be compared to a pre-determined PSC rate (the base rate). All ICA provisions for fleet PSC avoidance behavior, closures, and enforcement are based on the ratio of the cooperative's actual salmon PSC rate to the base rate.

Each cooperative participating in the ICA is assigned to one of three tiers, based on its salmon PSC rate relative to the base rate. Higher tiers correspond to higher salmon PSC rates. Tier assignments determine access privileges to specific areas. A cooperative assigned to a high tier is restricted from fishing in a relatively larger geographic area, to avoid unacceptably high salmon PSC areas. A cooperative assigned to a low tier (based on relatively low salmon PSC rates) is granted access to a wider range of fishing areas. The private contractor tracks salmon PSC rates for each cooperative. A participating cooperative is assigned to a tier each week based on its salmon PSC rate for the previous week. Thus, vessels have economic and operational incentives to avoid fishing behavior that results in high salmon PSC rates.

Parties to the ICA include the following AFA cooperatives: Pollock Conservation Cooperative, the High Seas Catchers Cooperative, the Mothership Fleet Cooperative, the Inshore Cooperatives (Akutan Catcher Vessel Association, Arctic Enterprise Association, Northern Victor Fleet Cooperative, Peter Pan Fleet Cooperative, Unalaska Fleet Cooperative, UniSea Fleet Cooperative, and Westward Fleet Cooperative) and all six CDQ groups. Additionally, two western Alaskan groups that have an interest in the sustainability of salmon resources would be parties in the ICA. All these groups have participated in meetings to develop the ICA and have a compliance responsibility in the agreement.

BSAI Salmon Bycatch

Collectively, the Chinook and non-Chinook salmon PSC measures implemented through the RHS system and Amendment 91 arguably represent the most extensive PSC reduction efforts that have ever been undertaken.

Key advantages of the hotspot system relative to fixed closures include:

- Sea State has shown the ability to make trade-offs between non-Chinook and Chinook PSC and to consider how vessels will respond.
- Adjustments to what areas will be closed can be made regularly in response to the substantial inter-annual variability in the quantity and concentration of PSC. This prevents the possibility that fixed closures would consistently force vessels from low-PSC areas, which is a possibility with any system that cannot adjust.

Anecdotal information from vessel operators and plant managers can be combined with observer data, VMS data, and knowledge of how seasonal PSC conditions evolve to make well-informed predictions of where salmon PSC will occur in the near-term.

- The system can adapt with new information. For example, from the 8/27/07 SeaState report – "It would be particularly useful to know if there is a temperature front associated with higher or lower PSC, as there was further up on the shelf."
- Through regular reporting to the Council and independent audits of potential violations, there is transparency in whether vessels adhere to closures. The number of violations of the closures has been very limited and seemingly generally due to mistakes by vessel operators.

Several potential limitations to the RHS system can also be noted:

- The restrictions of the non-Chinook RHS system constrain the maximum areas to be closed in a manner that this analysis suggests may be limiting at times. While the RHS system successfully reduces PSC by closing the highest-PSC areas to fishing, individual incentives to avoid PSC appear to be relatively small. At periods of wide-spread abundance such as 2005, vessel operators may still choose to fish in high PSC areas without direct economic consequences.

In balancing the non-Chinook and Chinook PSC, the RHS system has demonstrated the ability to carefully balance the trade-offs in a manner that could not be done with fixed closures. The program has continued to evolve and learn from new challenges.

GOA Salmon Bycatch

Pacific salmon are taken as bycatch in the GOA groundfish fisheries, in which they are considered prohibited. Although five species of salmon are caught in the fisheries, the Council has been concerned about Chinook salmon, as the species with the highest bycatch in recent years. Chinook salmon bycatch primarily occurs in trawl fisheries, in the central and western regulatory areas. Between 2003 and 2010, the pollock target fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily non pelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder. In 2011, the Council approved Chinook salmon PSC limits for the GOA pollock fisheries in the central and western regulatory areas. Once these annual limits are reached, the pollock fishery in the respective regulatory area will be closed. The Council is also considering other, comprehensive management measures to address Chinook salmon bycatch in the GOA trawl fisheries.

www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOA.pdf
http://www.fakr.noaa.gov/regs/679c30.pdf
http://www.fakr.noaa.gov/npfmc/PDFdocuments/bycatch/ChumRIR511.pdf
http://www.fakr.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html

Evidence adequacy rating:	
☑High ☐ Medium ☐ Low	
Clause:	**Evidence**
3.2.4	**Biodiversity of aquatic habitats and ecosystems is conserved and endangered species are protected (through FMPs regulations).** The Groundfish FMPs for the GOA and the BSAI essentially set regulations for the sustainable exploitation of the groundfish resources of which pollock is the single most abundant species. In addition to this, the species bycaught in each of these fisheries making up the groundfish complex are taken into account and managed accordingly in one form or another (i.e. PSC limits, Maximum Retainable Allowance etc..). This framework is therefore concerned with the overall conservation of biodiversity of aquatic habitats and ecosystems in the GOA and BSAI. In addition to this, the purpose of the Endangered Species Act (ESA) is to conserve threatened and endangered species and their ecosystems. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. Two federal agencies, the NMFS and the U.S. Fish and Wildlife Service (USFWS), are responsible for maintaining lists of species that meet the definition of threatened or endangered under the ESA. NMFS is responsible for maintaining the endangered species list for marine species and managing those species once they are listed. The USFWS is responsible for maintaining the endangered species list for terrestrial and freshwater species and managing those species once they are listed. NMFS and USFWS must determine if any species is endangered because of any of the following factors: • The present or threatened destruction, modification, or curtailment of its habitat of range; • Overutilization for commercial, recreational, scientific, or educational purposes; • Disease or predation; • The inadequacy of existing regulatory mechanisms; • Other natural or manmade factors affecting its continued existence. Alaska has 14 species designed as endangered by NMFS and USFWS: • Aleutian Shield Fern • Blue Whale • Bowhead Whale • Cook Inlet Beluga Whale • Eskimo Curlew • Fin Whale • Humpback Whale • Leatherback Sea Turtle • North Pacific Right Whale • Sei Whale • Short-tailed Albatross • Sperm Whale • Steller Sea Lion (west of 144º) • Wood Bison

The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may be granted limited take through special permits with conservation plans. Adverse effects on listed species must be minimized, and in some cases conservation efforts are required to offset the take.

Critical Habitat

The ESA requires that management agencies identify and protect critical habitat for all endangered species. Critical habitat consists of the land, water, and air necessary for the recovery of the endangered species, and the extent and location of critical habitat will be determined by the species' needs of open space for individual and population growth, food, water, light (or other nutritional requirements), breeding sites, dispersal, seed germination, and lack of disturbance. Critical habitat has been designated for some, but not all, endangered species that occur in Alaska.

State Species of Concern

ADFG is responsible for determining and maintaining a list of endangered species in Alaska under AS 16.20.190. A species or subspecies of fish or wildlife is considered endangered when the Commissioner of ADFG determines that its numbers have decreased to such an extent as to indicate that its continued existence is threatened. The State Endangered Species List currently includes two birds (Short-tailed Albatross and Eskimo Curlew) and three marine mammals (blue whale, humpback whale, and right whale). The five State listed species are also listed as endangered under the United States ESA.

Protection of Habitat

By law, the Commissioners of ADFG and Natural Resources must take measures to preserve the natural habitat of fish and wildlife species that are recognized as threatened with extinction. Details on protection of habitat can be found in AS 16.20.185.

Relation to the Alaska Pollock Fishery

Relative to the pollock fishery in the GOA and BSAI, stellar sea lions are of particular concern.

Since 1992, the GOA pollock total allowable catch (TAC) has been apportioned seasonally and spatially to protect Steller sea lions. In December 1998, NMFS issued a biological opinion that the pollock fishery jeopardized the continued existence or adversely modified the critical habitat of Steller sea lions. In response, the Council prohibited pollock fishing within 10-20 nautical miles of numerous rookeries and haulouts, reduced the catch of pollock within critical habitat areas, and distributed fishing effort.

In the BSAI temporal and spatial dispersion of the fleet has been accomplished through fishery exclusion zones around rookeries or haulout sites, phased in reduction in the seasonal proportions of TAC that can be taken in Steller sea lion critical habitat, and additional seasonal TAC allocations.

Relating to Steller sea lions, the BSAI and GOA Groundfish FMP specifies:

- Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification of 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.
- 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 (this was also adopted by the BOF for the PWS state fishery).
- Gear testing exemptions must not be within a designated Steller sea lion protection area at any time of the year.

Several measures have also been taken in relation to the important Chinook and non-Chinook salmon bycatch in the GOA and BSAI pollock fisheries. Please see clause 3.2.3 for evidence.

http://www.adfg.alaska.gov/index.cfm?adfg=specialstatus.main
http://www.fakr.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html
http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html
http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
3.2.5	**Depleted stocks are allowed to recover or, where appropriate, are actively restored (through the harvest control rule, overfishing and overfished status determination).**

Depleted stocks are allowed to recover or, where appropriate, are actively restored. The BSAI pollock stock is above target reference point. The GOA pollock stock is above limit reference point, below target reference point, and increasing.

Overfishing and Overfished Status Determinations

To the extent practicable, two status determinations are made annually for each stock and stock complex. The first is the ―overfishing status, which describes whether *catch* is too *high*. The second is the ―overfished status, which describes whether *biomass* is too *low*.

Determination of "Overfishing" Status

The OFL for a given calendar year is specified at the end of the preceding calendar year on

	the basis of the most recent stock assessment. For each stock and stock complex, a determination of status with respect to —overfishing is made inseason as the fisheries are monitored to prevent exceeding the TAC and annually as follows: If the catch taken during the most recent calendar year exceeded the OFL that was specified for that year, then overfishing occurred during that year; otherwise, overfishing did not occur during that year. In the event that overfishing is determined to have occurred, an inseason action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to end such overfishing immediately. **Determination of “Overfished” Status** A stock or stock complex is determined to be — overfished if it falls below the MSST. According to the National Standard Guidelines definition, the MSST equals whichever of the following is greater: One-half the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years, if the stock or stock complex were exploited at the MFMT. 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 MSA. 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. The MSA also requires identification of any fisheries that are —approaching a condition of being overfished, which is defined as a determination that the fishery —will become overfished within two years. The —approaching overfished determination is made by projecting the numbers-at-age vector from the current year forward two years under the assumption that the stock will be fished at *maxFABC* in each of those years, then determining whether the stock would be considered —overfished at that time. In the event that a stock or stock complex is determined to be approaching a condition of being overfished, an inseason action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to prevent overfishing from occurring. In other words, fishing will be decreased or stopped accordingly. http://www.afsc.noaa.gov/refm/stocks/assessments.htm http://www.fakr.noaa.gov/npfmc/fishery-management-plans/bsai-groundfish.html http://www.fakr.noaa.gov/npfmc/fishery-management-plans/goa-groundfish.html	

B. Science and Stock Assessment Activities

4. There shall be effective fishery data (dependent and independent) collection and analysis systems for stock management purposes. ***FAO CCRF 7.1.9/7.4.4/7.4.5/7.4.6/8.4.3/12.4*** ***FAO Eco 29.1-29.3***						
Confidence Ratings	**Low**	**0 out of 14**	**Medium**	**0 out of 14**	**High**	**14 out of 14**

Clause: **4.1 Reliable and accurate data required for assessing the status of fisheries and ecosystems - including data on retained catch of fish, by catch, discards and waste shall be collected.** **4.1.1 These data shall be collected, at an appropriate time and level of aggregation, by relevant management organizations connected with the fishery.** ***FAO CCRF 7.4.6, 7.4.7, 12.4*** ***Eco 29.1-29.3*** **4.1.2 Timely 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 shall be promoted.** ***FAO CCRF 7.4.4, 12.13*** ***Eco 29.1***	
Evidence adequacy rating: **☑High ☐ Medium ☐ Low**	
Clause:	**Evidence**
4.1	**Reliable and accurate data required for assessing the status of fisheries and ecosystems - including data on retained catch of fish, by catch, discards and waste are collected (BSAI and GOA surveys, catch data, observer data).** The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the pollock fishery and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected.

EBS Fishery

The following table summarizes data used by the agencies to assess pollock fisheries in the BS as described in annual Stock Assessment and Fishery Evaluation (SAFE) report.

Source	Data	Years
Fisheries	Total Catch	1964-2010
	Catch age composition	1979-2009
NMFS EBS Trawl Survey	Biomass, age composition	1979-2010 (1979-1981 results omitted from assessment model)
	Acoustic index between fishing stations	2006-2009
NMFS Acoustic Trawl (AT) Survey	Biomass, age composition	1979, 1982, 1985, 1988, 1991, 1994, 1996, 1997, 1999, 2000, 2002, 2004, 2006-2010 (see table 1.13 for sample sizes)

Catches of pollock from the EBS were low from 1954 to 1963. Foreign fisheries began in 1964 and catch increased rapidly in the 1960s and reached a peak in 1970-75. 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 ranging from 0.815 million t in 2009 to nearly 1.5 million t during 2003-2006. United States vessels began fishing for pollock in 1980 and by 1987 they were able to take 99% of the quota. Prior to the domestication of the pollock fishery, the catch was monitored by placing observers on foreign vessels. Since 1988, only U.S. vessels have been operating in this fishery. By 1991, the current NMFS observer program for north Pacific groundfish fisheries was in place. Landings have been recorded by a combination of ADFG fish tickets and more recently the electronic eLandings system. Landings are verified by shorebased observers. Estimates of discards are compiled from fishing logbooks and at-sea observer data.

The age composition of the catches has been estimated annually from 1979 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions.

Two fishery-independent research surveys have been used to estimate trends in the population abundance, size and age composition. A bottom trawl survey has been conducted in the EBS annually since 1979. This survey gives an estimate of the near-bottom component of the population defined by the fraction of the population within the depth range sampled by the bottom trawl. This population component tends to be older than the off-bottom component. An acoustic-Trawl (AT) survey has also been conducted to estimate the off-bottom component of the population. The frequency of the survey has increased over the period 1979-2010 from initially every 3 years to annually in recent years (see table above). The acoustic survey tends to catch younger fish than the trawl survey because of the distribution of age groups in the water column, and the combination of the two surveys gives a more complete coverage of the age distribution of the population.

GOA Fishery

The following table summarizes data used by the agencies to assess pollock fisheries in the GOA as described in annual Stock Assessment and Fishery Evaluation (SAFE) report.

Source	Data	Years
Fisheries	Total Catch	1964-2010
	Catch age composition	1976-2009
NMFS GOA Trawl Survey	Biomass, age composition	1984, 1987, 1990, 1993, 1996, 1999, 2001, 2003, 2005, 2007, 2009
NMFS Shelikov Strait Echo Integration Trawl (EIT) Survey	Biomass, age composition	1981-2010, except 1982 and 1999
	maturity at age	1983-2010 except 1999
NMFS Shelikov Strait egg survey	biomass	1985-1992
ADFG crab/groundfish trawl survey	Biomass, length comp	1989-2010 except 1991 and 1995
	age comp	2000, 2002, 2004, 2006, and 2008
Historical trawl surveys	biomass, length composition	1961, 1962, 1970, 1971, 1974, 1975, 1978, 1980, 1981, and 1982
	age composition	1973

	The commercial fishery for pollock in the GOA started as a foreign fishery in the early 1970s. Catches increased rapidly during the late 1970s and early 1980s. A large spawning aggregation was discovered in Shelikof Strait in 1981, and a fishery developed for which pollock roe was an important product. The domestic fishery for pollock developed rapidly in the Gulf of Alaska with only a short period of joint venture operations in the mid-1980s. The fishery was fully domestic by 1988. Total catch is currently estimated by the NMFS regional office from landings records and observer estimates of discards. Catch estimates include the state managed fishery in PWS. The age composition of the GOA catches has been estimated annually from 1976 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions. Three fishery-independent research surveys are conducted to estimate population abundance and age composition. A bottom trawl survey have been conducted by the AFSC every three years (beginning in 1984) to assess the abundance of groundfish in the Gulf of Alaska. Starting in 2001, the survey frequency was increased to every two years. Echo integration trawl (EIT) surveys have been conducted annually since 1981 (except 1982 and 1999) to assess the biomass and age composition of pollock in the Shelikof Strait area. The ADFG has conducted bottom trawl surveys of nearshore areas of the Gulf of Alaska since 1987. In addition, estimates of spawning biomass in Shelikof Strait based on egg production methods were available for 1981, 1985-1992. Results from a number of historical trawl surveys conducted during 1961-1982 were also available.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
4.1.1	**These data are collected, at an appropriate time and level of aggregation (BSAI and GOA), by relevant management organizations connected with the fishery, and provided to relevant States and sub-regional, regional and global fisheries organizations (NPFMC/ADFG, available on websites).** Several management organizations collect, aggregate and disseminate data related to the pollock fisheries, including the NPFMC, NMFS AFSC, and NMFS Alaska Region. Sections below describe their roles and responsibilities and the data they manage. **NPFMC** Stock Assessment and Fishery Evaluation Report The *Stock Assessment and Fishery Evaluation* (SAFE) report is compiled annually by the BSAI and GOA Groundfish Plan teams, which are appointed by the Council.	

The sections are authored by AFSC and State of Alaska scientists. The SAFE reports also include a volume assessing the *Economic Status of the Groundfish Fisheries off Alaska* as well as a volume on *Ecosystem Considerations*.

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.

The SAFE report annually updates the biological information base necessary for multispecies management. It also provides readers and reviewers with knowledge of the factual basis for total allowable catch (TAC) decisions, and illustrates the manner in which new data and analyses are used to obtain individual species groups estimates of acceptable biological catch and maximum sustainable yield. The SAFE reports can be found at http://www.afsc.noaa.gov/REFM/stocks/assessments.htm .

Other information produced by the Council can be accessed through its website:
http://www.fakr.noaa.gov/npfmc
This includes the following:

- FMPs: summaries of the FMPs as well as the FMPs themselves are available on the website.
- Meeting agendas and reports: annual quota specifications, amendments to the FMPs or implementing regulations, and other current issues are all discussed at the five annual meetings of the Council. Meeting agendas, including briefing materials where possible, and newsletter summaries of the meeting are available on the website, as well as minutes from the meetings.
- Current issues: the website includes pages for issues that are under consideration by the Council, including amendment analyses where appropriate.

ADFG Fish Tickets and eLandings electronic reporting.
Alaska Pollock landings data are being captured by a combination of paper-based fish tickets distributed and collected by the ADFG and more recently the eLandings system. This system is an electronic fish ticket system, for all catch data required to be reported in regulation. eLandings is the internet-based Interagency Electronic Reporting System for reporting commercial fishery landings in Alaska. eLandings is used to report landings and/or production data for groundfish, IFQ/CDQ halibut and sablefish, and IFQ/CDQ crab and Community of Adak golden king crab. In the future, the system will include landings for shellfish and salmon. This system is a collaborative effort of the Alaska Department of Fish and Game, the International Pacific Halibut Commission, and the NOAA Fisheries. The Restricted Access Management Division of NMFS tracks inseason catches. Registered Buyers must report landings electronically using the Internet (with permission, a backup paper submission system is available).

NMFS Alaska Fisheries Science Center (AFSC)

AFSC conducts research and monitoring in the pollock fishery. It provides information on its website including:

- Species summaries: a summary of each groundfish species, including AFSC research efforts addressing specific species where applicable.
- Issue summaries: a summary of major fishery issues is also available, such as bycatch or fishery gear effects on habitat.
- Research efforts: a summary of the research efforts for each of the major AFSC divisions is provided on the website.
- Observer Program: the homepage describes the history of the program and the sampling manuals that describe, among other things, the list of species identified by observers.
- Survey reports: the groundfish stock assessments are based in part on the independent research surveys that are conducted annually, biennially, and triennially in the management areas. Reports of the surveys are made available as NMFS-AFSC National Oceanic and Atmospheric Administration (NOAA) Technical Memoranda, and are available on the website; the data maps and data sets are also accessible.
- Publications: the AFSC Publications Database contains more than 4,000 citations for publications authored by AFSC scientists. Search results provide complete citation details and links to available on-line publications.
- Image library: the website contains an exhaustive library of fish species.

Staff at the AFSC are responsible for assembling input data for the stock assessment. These datasets include the fishery age composition and the results from fishery-independent research surveys.

The age composition of the EBS catch is estimated using a combination of otolith (age) and length frequency samples. Sampling and analysis is stratified by season and area to account for differences size by area and seasonal growth. The number of length frequency measurements is very high because of the high level of at-sea sampling by observers. Over the period 1977-2009, the annual average number of fish measured was just under 500,000. The frequency of length vs. age sample collection was modified in 1999 in order to increase the number of otoliths available for age determination. The number of aged fish annually was generally over 2,000, but with the change in sampling strategy in 1999, the annual average number aged was over 3,000.

A bottom trawl survey has been conducted in the EBS annually since 1979. The design of the survey was standardized to include consistent areas and gears in 1982 and has followed this design ever since. This survey provides an important abundance and age composition index for the population. An annual survey typically consists of about 370 fishing sets. The annual abundance index has a relatively low coefficient of variation (~11%) and this indicates a low level of sampling variability compared to many other species and surveys. The age composition of the survey catches was determined by a combination of length frequency and otolith sampling. The average number of fish measured for length was slightly over 39,000 and the number aged was close to 1,400. This survey gives an estimate of the near-bottom component of the population defined by the fraction of the population within the depth range sampled by the bottom trawl. This population component tends to be older than the off-bottom component.

An acoustic-Trawl (AT) survey has also been conducted in the EBS to estimate the off-bottom component of the population. The frequency of the survey has increased over the period 1979-2010 from initially every 3 years to annually in recent years (see table above). The survey uses a combination of hydroacoustic transects to estimate Pollock biomass and trawl samples to estimate size and age composition. The survey typically covers 31 north-south acoustic transects spaced 20 nmi apart. The number of fishing tows has varied between 25 and 126 with an average number of 72. The number of fish measured for length has varied between 6,619 and 43,729 with an average of 22,000. Approximately 2,000 fish are aged from each survey. The acoustic survey tends to catch younger fish than the trawl survey because of the distribution of age groups in the water column, and the combination of the two surveys gives a more complete coverage of the age distribution of the population.

The age composition of the GOA catch is estimated using a combination of otolith (age) and length frequency samples. The samples were assembled by area and season in order to account for differences in growth and size at age. Between 1989-2009 there were, on average, over 1800 otoliths sampled and 34,000 fish measured annually.

Trawl surveys have been conducted by the AFSC in the GOA every three years (beginning in 1984) to assess the abundance of groundfish species including pollock. Starting in 2001, the survey frequency was increased to every two years. The survey uses a stratified random design, with 49 strata based on depth, habitat, and management 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 poly-Northeastern high opening bottom trawls rigged with roller gear. In a typical survey, 800 tows are completed. On average, 70% of these tows contain pollock. Estimates of numbers at age in the pollock population were also obtained from the bottom trawl survey using random otolith samples and length frequency samples. The average number of fish aged from each survey was slightly greater than 1400 and slightly over 30,000 fish were measured for length.

Echo integration trawl (EIT) surveys have been conducted annually since 1981 (except 1982 and 1999) to assess the biomass and age composition of pollock in the Shelikof Strait area. The R/V Miller Freeman equipped with a Biosonics echosounder was used from 1981-1993. A Simrad EK500 echosounder was used from 1992-2007. In 2008, the noise-reduced R/V Oscar Dyson became the designated survey vessel for acoustic surveys in the Gulf of Alaska. In winter of 2007, a vessel comparison experiment was conducted between the R/V Miller Freeman and the R/V Oscar Dyson, which obtained an OD/MF ratio of 1.132 in Shelikof Strait. Midwater and bottom trawls were conducted during these surveys to collect otolith samples used to estimate the age composition and maturity schedule of the pollock population. The annual number of otoliths sampled declined over the time with an average of 2200 in the 1980s, 1400 in the 1990s, and 670 in the 2000s. The reduction in the number of fish aged is not expected to affect the precision of age composition estimates.

Estimates of spawning biomass in Shelikof Strait based on egg production methods were available for 1981, 1985-1992. The estimate for 1981 is questionable because of sampling deficiencies during the egg surveys for that year. Egg production surveys were discontinued after 1992 because the Shelikof Strait EIT survey provided similar information.

Results from a number of historical trawl surveys conducted during 1961-1982 were also available.

NMFS Alaska Region

NMFS Alaska region maintains in season and end of year catch statistics for the groundfish fishery dating back to 1993, or earlier for some fisheries; annual harvest specifications and season opening and closing dates; and reports on share-based fishery programs (such as the individual fishing quota program for fixed-gear sablefish) On its website it also provides:

- Status of analytical projects
- Habitat protection: maps of essential fish habitat, including a queriable database; status of marine protected areas and habitat protections in Alaska Permit information: applications for and information on permits for Alaska fisheries; data on permit holders.
- Enforcement: reports, requirements, and guidelines.
- News releases: recent information of importance to fishers, fishery managers, and the interested public.
- Regulations: the FMP's implementing regulations can be found on the Alaska region website, as well as links to the Magnuson-Stevens Act, the American Fisheries Act, the International Pacific Halibut Commission, and other laws or treaties governing Alaska's fisheries .

NMFS Alaska region is also responsible for the *Final Programmatic Supplemental Environmental Impact Statement for the Alaska Groundfish Fisheries* (NMFS 2004). Published in 2004, it is a programmatic evaluation of the BSAI and GOA groundfish fisheries, including pollock. The document includes several alternative management policies for the fisheries, and provides the supporting analysis for Amendment 81 to the BSAI FMP, which changed the FMP management policy. The document contains a detailed evaluation of the impact of the FMP on groundfish resources, other fish and marine invertebrates, habitat, seabirds, marine mammals, economic and socioeconomic considerations, and the ecosystem as a whole.

	The impacts are evaluated in comparison to a baseline condition (for most resources this is the condition in 2002) that is comprehensively summarized and includes the consideration of lingering past effects. Additionally, sections of the document describe the fishery management process in place for the Alaska federal fisheries, and the changes in management since the implementation of the FMP in 1982. See website at: http://www.fakr.noaa.gov/ **ADFG** The 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 Tanner crab and red king crab, pollock and other fish are also sampled. Standardized survey methods using a 400-mesh eastern trawl were employed from 1987 to the present. The survey is designed to sample a fixed number of stations from Kodiak Island to Unimak Pass, and does not cover the entire shelf area. The average number of tows completed during the survey is 360. Pollock length-frequencies were available for 1989-2009 (excluding 1991 and 1995). Age compositions were determined from otoliths collected during the 2000, 2002, 2004, 2006, and 2008 surveys (N = 559, 538, 591,588, and 597).

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
4.1.2	**Timely (yearly SAFE reports), complete and reliable statistics are compiled on catch and fishing effort and maintained in accordance with applicable international standards and practices and in sufficient detail to allow sound statistical analysis for stock assessment. Such data are updated regularly (yearly) and verified through an appropriate system (peer review). The use of research results as a basis for the setting of management objectives (NPFMC/ADFG), reference points and performance criteria, as well as for ensuring adequate linkage, between applied research and fisheries management is promoted.** Catches and landings of pollock as well as fishing effort from the relevant fisheries from the EBS and GOA are now monitored and counter checked by a combination of landings slips, fishing logbooks, at-sea and shore based fishery observers. Landings statistics are compiled and reported by NMFS Alaska Region. The monitoring data are used for inseason fishery catch management and are available on a real time basis. These statistics are compiled annually for inclusion in the pollock stock assessments and are summarized in various reports dealing with the social and

economic aspects of the fisheries.

Landings data have been recorded on ADFG fish tickets and more recently (since 2005) through the eLandings system. One fish ticket of eLanding report covers an entire vessel offload, recording all permits associated with the landing report at the same time. E-landings are then verified against processors/sales data by NMFS. All report information is stored on one server and data are available to NMFS, ADFG, and the International Pacific Halibut Commission for their scientific, management and enforcement purposes. The data are entered once by one person thus creating fewer data entry errors and the data are verified in real time. Prior to 2005, landings data were recorded through paper-based fish tickets. (http://www.adfg.alaska.gov/index.cfm?adfg=wildlifenews.view_article&articles_id=247&issue_id=43)

The EBS pollock fishery is prosecuted almost entirely by vessels greater than 60 feet in length. As a result, almost all vessel captains are required to complete fishing logbooks that record the location and catch composition of their fishing activities, including catches of non-directed species and prohibited species. This, in addition to the observer data provides a way to verify and substantiate logbook data. The fleet is made up of catcher vessels and catcher/processor vessels. The former either delivers their catch to shoreside processing plants or to another vessel for processing at sea.

Catcher vessel (excluding catcher-processors) weeks of fishing groundfish off Alaska by area, vessel –length class (feet) and target, 2005-2009. (Table 48 from the 2010 Economic SAFE document)

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-124	>=125	<60	60-124	>=125	<60	60-124	>=125
Trawl	Pollock	2005	137	355	-	-	995	598	137	1350	598
		2006	139	396	-	1	973	624	140	1370	624
		2007	96	237	-	-	1119	637	96	1357	637
		2008	92	224	1	-	871	507	92	1096	508
		2009	95	121	-	-	802	431	95	923	431

Catcher/Processor vessel weeks of fishing groundfish off Alaska by area, vessel –length class (feet) and target, 2005-2009. (Table 49 from the 2010 Economic SAFE document)

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			60-124	125-230	>230	60-124	125-230	>230	60-124	125-230	>230
Trawl	Pollock	2005	-	-	-	2	27	325	2	27	325
		2006	-	-	-	1	28	347	1	28	347
		2007	-	-	-	1	31	358	1	31	358
		2008	-	-	-	1	36	289	1	36	289
		2009	0	-	-	4	16	242	4	16	242

	A large number of these vessels are also required to carry fishery observers who provide additional information on fishing activities and collect biological samples of the catch. Vessels over 125 feet in length are required to carry observers 100% of the time. Vessels between 65-125 feet are required to carry observers 30% of the time. Two observers are also permanently deployed on motherships participating in the AFA fishery. Furthermore, all AFA listed catcher/processor vessels are required to carry observers 100% of the time. AFA catcher vessels that do not deliver unsorted codends to a processor or another vessel are required to carry an observer 100% of the time. However, the catches in these unsorted codends are observed onboard the receiving vessel. After adjustment for the community development quota allocation (10%) and incidental catch of pollock in other fisheries (2-3%), the EBS pollock TAC is apportioned 50% to vessels harvesting pollock for inshore processing, 40% to vessels harvesting pollock for catcher/processor processing, and 10% to vessels harvesting pollock for mothership processing (BSAI FMP). Shoreside observers are deployed to all fish plants that process over 1000 t of groundfish per month, and to 30% of plants that process between 500-1000 t per month (679.50). The shoreside observers submit landings verification reports for all deliveries to the plants. When deployed on a landing vessel, the at-sea observer aids in this process. The entire GOA pollock TAC is allocated to the inshore sector and the fishery is prosecuted entirely by catcher vessels. Approximately 70% of pollock directed fishing in this area is conducted by vessels between 60 and 125 feet in length (economic SAFE Table 48-49). Vessel captains of vessels over 60 feet in length are required to complete fishing logbooks. All of the catch is delivered to shorebased plants for processing. http://www.fakr.noaa.gov/regs/part679_all.pdf http://alaskafisheries.noaa.gov/frules/afa_er2.pdf http://www.fakr.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/ObserverRegs1011.pdf Economic SAFE document GOA and BSAI stock assessments BSAI and GOA fishery management plans Pollock Assessment Bering Sea Alaska-Russia 2009.pdf	

Clause:

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 8.4.3

FAO Eco 29.2bis

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
4.2	**An observer scheme (NMFS managed) designed to collect accurate data for research and support compliance with applicable fishery management measures is established.** Fishing vessels and shore side processors that receive groundfish caught in the EEZ, are required to accommodate observers as specified in regulations, in order to verify catch composition and quantity, including at-sea discards, and collect biological information on marine resources. Except for small vessels less than 60 feet and halibut vessels, all vessels fishing for groundfish in federal waters are required to carry NMFS-certified observers, at their own expense, for at least a portion of their fishing time (BSAI and GOA FMP). The largest vessels, those 125 feet or longer, are generally required to carry observers 100% of the time, with multiple observers required on catcher/processors and in certain fisheries. Vessels between 60-125 feet long are required to carry observers 30% of the time. Additional regulations require higher coverage levels for individual entities and cooperatives that receive specific TAC allocations, such as vessels participating in CDQ programs and AFA pollock fisheries. In 2009, observers were deployed on 107 trawl catcher vessels for a total of 3,403 days, 37 trawl catcher/processor vessels for a total of 11,020 days, and 3 motherships for a total of 642 days (Table 51 in Economic SAFE). A review of the Alaska observer program conducted in 2010 revealed that the target levels of coverage were achieved in the various fishing sectors directing at Alaska pollock (Observer restructuring report). The pollock fishery in the BS is conducted entirely by AFA vessels over 60 feet in length. Almost all of these vessels carry at least 1 observer 100% of the time as required by 679.50. The only exception is catcher vessels that deliver unsorted codends to other vessels for processing. In these cases, the catches are examined by observers on the receiving vessels. Between 2004-2007, 87% of the BS pollock directed catch was taken by vessels with observers onboard (Observer restructuring report) and the remaining catch was examined by observers on vessels that received	

	unsorted catch. The GOA pollock fishery is conducted entirely by catcher vessels under 125 feet in length. Only the vessels over 60 feet are required to carry observers and only 30% of their fishing effort is observed. Vessels under 60 feet in length, that account for approximately 30% of the fishing weeks in the GOA, are not required to carry observers. However, these vessels do not sort their catch onboard for safety reasons. Instead, the catches are either pumped directly to other carriers or placed directly into the catcher vessel hold. The catches are then examined when landed at shoreside plants where there is 100% observer coverage. Between 2004-2007, 31% of the GOA pollock directed catch was taken by vessels with observers onboard (Observer restructuring report). The NPFMC and NMFS are undertaking a review of the observer program to address a number of operational concerns. These include the disproportionate percentage of revenue paid by some sectors to fulfill observer coverage requirements, the inability of NMFS to determine when and where observers will be deployed in sectors with less than 100% coverage requirements, the inability to effectively tailor coverage levels and deployment patterns to address emergent management needs, and the lack of data from vessels not subject to observer coverage under the existing requirements. Five restructuring options are being considered and each one includes an increase in coverage for vessels < 60 feet in length. Consultation on these options is ongoing (Observer restructuring report).	

Clause:

4.3 Sufficient knowledge of social, economic and institutional factors relevant to the fishery in question shall be developed through data gathering, analysis and research.

FAO CCRF 7.4.5

4.3.1 **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 7.4.6, 7.4.7

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	**Evidence**	
4.3	**Sufficient knowledge of social, economic and institutional factors relevant to the fishery in question is developed through data gathering, analysis and research (Economic and Social Sciences Research Program within NMFS's REFM).**	

	The MSFCMA's National Standard 8 mandates that Conservation and management measures shall, consistent with the conservation requirements of this 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. Accordingly, the NMFS and ADFG hold public meetings throughout the year in a variety of convenient locations. Participation is actively pursued. Moreover, the GOA and BSAI FMPs define two long-term management and policy objectives that provide an enabling framework to develop knowledge of social, economic, and institutional factors relevant to the sablefish fishery. These objectives and their sub-objectives are: **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 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. **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. **NMFS economic and social information.** The Economic and Social Sciences Research Program within NMFS's REFM provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Much of the existing economic data about Alaskan fisheries is collected and organized around different units of analysis, such as counties (boroughs), fishing firms, vessels, sectors, and gear groups. It is often difficult to aggregate or disaggregate these data for analysis at the individual community or regional level. In addition, at present, some relevant community level economic data simply are not collected at all. As a result, the North Pacific Fishery Management Council (NPFMC), the AFSC, and community stakeholder	

	organizations have identified ongoing collection of community-level socio-economic information that is specifically related to commercial fisheries as a priority. To address this need, the AFSC's Economic and Social Sciences Research (ESSR) Program has been preparing the implementation of the Alaska Community Survey, an annual voluntary data collection program initially focused on Alaska communities for feasibility reasons, in order to improve the socio-economic data available for consideration in North Pacific fisheries management. http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php In 2005, the AFSC compiled baseline socioeconomic information about the 136 Alaska communities most involved in commercial fisheries. Communities were selected by assessing fishery-involvement indicators including landings, processors, vessel homeports, vessel ownership, crew licenses, and gear operator permits. The profiles compiled information from the US Census, ADFG, CFEC, NMFS Restricted Access Management Division, Alaska Department of Community and Economic Development, and various community groups, websites, and archives. The 5-page profiles for each community follow the same general outline: • People and Place (Location, Demographics, History). • Infrastructure (Current Economy, Governance, Facilities). • North Pacific Fisheries involvement (Commercial, Recreational, Subsistence Fishing). The profiles were published as NOAA Technical Memorandum NMFS-AFSC-160 in December 2005. The report can be downloaded as a complete document (17.6 MB) from http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-160/NOAA-TM-AFSC-160.pdf. The AFSC is planning to update the Alaskan community profiles to include new U.S. Census data from 2010 and input from the communities and industry. The Economic status of the groundfish fisheries off the GOA and BSAI area can be found at http://www.afsc.noaa.gov/ REFM/docs/2010/economic.pdf. Socio-economic and institutional factors relevant to the EBS pollock fishery were collected by NMFS and analysed through the NEPA process before management decision such as the CDQ program were implemented. The AFA specifies how the TAC is allocated annually among the three sectors of the BSAI pollock fishery (inshore, catcher processors, and motherships) and community development quota (CDQ) groups. The AFA also specifically identifies the catcher/processors and catcher vessels that are eligible to participate in the Bering Sea-Aleutian Islands (BSAI) pollock fishery, and provides for the formation of cooperatives that effectively eliminates the race for fish. Under the cooperative agreements, members limit their individual catches to a specific percentage of the TAC allocated to their sector. Once the catch is allocated, members can freely transfer their quota to other members. http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php CDQs. 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 residents themselves have fished the CDQ. The purpose of the CDQ Program was to provide western Alaska fishing 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 was intended to help western Alaska communities to diversify their local economies and to provide new opportunities for stable, long-term employment. The original Council guidance for implementing the CDQ Program focused on using the allocations to develop a self- sustaining fisheries economy. http://www.fakr.noaa.gov/regs/679c30.pdf

Public process. The Alaska Board of Fisheries and the North Pacific Fishery Management Council are openly public processes. Any individual or group can submit proposals for discussion of management and research for sablefish fisheries in Alaska. The BOF meets in communities throughout coastal Alaska, while the NPFMC meets in communities in Alaska as well as in Washington and Oregon to provide public opportunities. Written comments are accepted when it is not possible to attend in person http://www.fakr.noaa.gov/npfmc/ and http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main

The Council, as outlined in policy, also continues to incorporate local and traditional knowledge in fishery management, considers ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate. They also actively work to increase Alaska Native participation and consultation in fishery management through community workshops (http://www.alaskafisheries.noaa.gov/npfmc/fmp/goa/GOA.pdf).

AFKIN. The Alaska Fisheries Information Network (AKFIN) was established in 1997 under the direction of the Pacific States Marine Fisheries Commission (PSMFC) to consolidate, manage and dispense information related to Alaska's commercial fisheries. AFKIN was founded in response to an increased need for detailed, organized fishery information to help in making management decisions with a mission to maintain an analytic database of both state and federal historic, commercial Alaska fisheries data relevant to the needs of fisheries analysts and economists and to provide that data in a usable format (http://www.akfin.org/about-akfin).

<table>
<tr><td colspan="3">Evidence adequacy rating:

☑High ☐ Medium ☐ Low</td></tr>
<tr><td>Clause:</td><td>Evidence</td><td></td></tr>
<tr><td>4.3.1</td><td>Sub-regional or regional fisheries management organizations or arrangements compile data and make them available, in a manner consistent with any applicable confidentiality requirements (NOAA administrative order 216-100), in a timely manner and in an agreed format to all members of these organizations and other interested parties in accordance with agreed procedures.

NOAA administrative order 216-100 prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS). Confidential data are those identifiable with a person. Before release to the public, data must be aggregated to protect the individual identities. For fisheries data, this requires that there must be at least 3 entities contributing to any level of aggregated data. Only authorized users have access to confidential data, they must have a need to collect or use these data in the performance of an official duty, and they must sign a statement of nondisclosure affirming their understanding of NMFS obligations with respect to confidential data and the penalties for unauthorized use and disclosure. Confidential data must be maintained in secure facilities. Data collected by a contractor, such as an observer contractor, must be transferred timely to authorized Federal employees; no copies of these data may be retained by the contractor. NMFS may permit contractors to retain aggregated data. A data return clause shall be included in the agreement. All procedures applicable to Federal employees must be followed by contractor employees collecting data with Federal authority. Under agreements with the State, each State data collector collecting confidential data will sign a statement at least as protective as the one signed by Federal employees, which affirms that the signer understands the applicable procedures and regulations and the penalties for unauthorized disclosure.</td><td></td></tr>
</table>

Clause:

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

FAO CCRF 12.7

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause	Evidence
4.4	**Alaska stimulate the research required (through ASMI, FDA, USDA, NIH) to support national policies related to fish as food.** State and national policies regarding seafood are guided and driven by the Alaska Seafood Marketing Institute (ASMI), Food and Drug Administration (FDA), Department of Agriculture (USDA), the National Institute of Health (NIH) and many others. ASMI is the state agency primarily responsible for increasing the economic value of Alaskan seafood through marketing programs, quality assurance, industry training, and sustainability certification. The powers of the ASMI board include: conducting or contracting for scientific research to develop and discover health, dietetic, or other uses of seafood harvested and processed in the state, and prepare market research and product development plans for the promotion of any species of seafood and their by products (Alaska Statute 16.51.090 Powers of Board). The State of Alaska also operates the Fishery Industrial Technology Center as a component of the University of Alaska (http://www.sfos.uaf/fitc/). The Fishery Technology Center provides training for harvesting, processing, and conservation of fisheries resources of Alaska, provides research and development activities to adapt existing or create new technologies to enhance the economic value of the industry, and encourages joint projects between the fishing industry and government to enhance the productivity of the fishing industry. Alaska regulations also stipulate that the harvest of the resource will be in a manner that emphasizes the quality and value of the fishery product (5 AAC 28.089. GUIDING PRINCIPLES FOR GROUNDFISH FISHERY REGULATIONS, (6) harvest of the resource in a manner that emphasizes the quality and value of the fishery product). http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/aac/query=[JUMP:%27Title5Chap28%27]/doc/%7B@1%7D?firsthit

Clause: **4.5** **States shall ensure 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.** ***FAO CCRF 12.9***		
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause	**Evidence**	
4.5	**The economic, social, marketing and institutional aspects of fisheries are adequately researched and comparable data are generated for ongoing monitoring, analysis and policy formulation (The Economic and Social Sciences Research Program within NMFS's REFM, Economic SAFE).** The Economic and Social Sciences Research Program within NMFS's REFM provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Much of the existing economic data about Alaskan fisheries is collected and organized around different units of analysis, such as counties (boroughs), fishing firms, vessels, sectors, and gear groups. These data are reported annually in the Economic SAFE documents. Socio-economic and institutional factors relevant to the EBS pollock fishery were collected by NMFs and analysed through the NEPA process before management decision such as the CDQ program were implemented. See section 4.3 for details. In 2005, the AFSC compiled baseline socioeconomic information about the 136 Alaska communities most involved in commercial fisheries. Communities were selected by assessing fishery-involvement indicators including landings, processors, vessel homeports, vessel ownership, crew licenses, and gear operator permits. The profiles compiled information from the US Census, ADFG, CFEC, NMFS Restricted Access Management Division, Alaska Department of Community and Economic Development, and various community groups, websites, and archives. The 5-page profiles for each community follow the same general outline: • People and Place (Location, Demographics, History). • Infrastructure (Current Economy, Governance, Facilities). • North Pacific Fisheries involvement (Commercial, Recreational, Subsistence Fishing). The profiles were published as NOAA Technical Memorandum NMFS-AFSC-160 in December 2005. The report can be downloaded as a complete document (17.6 MB) from http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-160/NOAA-TM-AFSC-160.pdf.	

	The AFSC is planning to update the Alaskan community profiles to include new U.S. Census data from 2010 and input from the communities and industry. The Economic status of the groundfish fisheries off the GOA and BSAI area can be found at http://www.afsc.noaa.gov/ REFM/docs/2010/economic.pdf. **AFKIN.** The Alaska Fisheries Information Network (AKFIN) was established in 1997 under the direction of the Pacific States Marine Fisheries Commission (PSMFC) to consolidate, manage and dispense information related to Alaska's commercial fisheries. AFKIN was founded in response to an increased need for detailed, organized fishery information to help in making management decisions with a mission to maintain an analytic database of both state and federal historic, commercial Alaska fisheries data relevant to the needs of fisheries analysts and economists and to provide that data in a usable format. http://www.akfin.org/about-akfin	

Clause:

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

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause	Evidence	
4.6	**The Alaska pollock fishery is a fully developed and largely industrial fishery that uses modern deep sea fishing technology.** The fishery began in the 1970s and it originally was prosecuted by vessels from Japan and the former USSR. With the establishment of the US EEZ, the fishery converted to being entirely prosecuted by vessels from the US during the 1980s. Traditional fisheries knowledge regarding Alaska pollock has been gathered and used in ongoing management regimes.	

Clause:
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
Evidence adequacy rating:
☑**High** ☐ **Medium** ☐ **Low**

Clause	Evidence	
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.** There is some indication, based on NMFS surveys, that there is some overlap of pollock in the eastern and western Bering Sea across the Russia/US border. The US acoustic trawl survey has been designed to survey the entire population and thus crosses the international border. Permission to do this is obtained from the Ministry of Foreign Affairs of the Russian Federation. (Pollock Assessment Bering Sea Alaska-Russia 2010.pdf)	

Clause:
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 the results of such research with other regions.**
FAO CCRF 12.15, 12.16
Evidence adequacy rating:
☑**High** ☐ **Medium** ☐ **Low**

Clause	Evidence	
4.8	**Alaska promotes the adoption of uniform guidelines (NPFMC/ADFG) governing fisheries research conducted on the high seas and, where appropriate, supports 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 the results of such research with other regions.**	

	Research on pollock is conducted by NMFS and ADFG. The research protocols and survey methodology are developed jointly and conform to standards required for inclusion in assessment and management. The AT survey in the BS is conducted by a NOAA research vessel the *Oscar Dyson* and the survey design and sampling protocols are agreed to by US and Russian scientists. Russian scientists join the vessel for survey activities conducted in Russian waters. The results are shared between these agencies as well as with Russian researchers.	

Clause:

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 anti 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

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause	Evidence	
4.9	**No developing country participates in the Alaska pollock fishery.** The Alaska pollock fishery is a fully developed and largely industrial fishery that uses modern deep sea fishing technology. The fishery began in the 1970s and it originally was prosecuted by vessels from Japan and the former USSR. With the establishment of the US EEZ, the fishery converted to being entirely prosecuted by vessels from the US during the 1980s. Developing countries do not participate in this fishery.	

Clause:		
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***	
Evidence adequacy rating:	☑**High** ☐ **Medium** ☐ **Low**	
Clause	**Evidence**	
4.10	**The Alaska pollock fishery is a fully developed and largely industrial fishery that uses modern deep sea fishing technology.** See section 4.9	

Clause:		
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***	
Evidence adequacy rating:	☑**High** ☐ **Medium** ☐ **Low**	
Clause	**Evidence**	
4.11	**The Alaska pollock fishery is a fully developed and largely industrial fishery that uses modern deep sea fishing technology. No developing country participates in the Alaska pollock fishery.** See section 4.9	

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 7.2.1/12.2/12.3/12.5/12.6/12.7/12.17*** ***FAO Eco 29-29.3***						
Confidence Ratings	**Low**	**0 out of 11**	**Medium**	**0 out of 11**	**High**	**11 out of 11**

Clause:

5.1 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. The research shall be disseminated accordingly. 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 12.1, 7.4.2

5.1.1 An appropriate institutional framework shall be established to determine the applied research which is required and its proper use (i.e. assess/evaluate effectiveness of stock assessment model) for fishery management purposes.

FAO CCRF 12.2, 12.6

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	Evidence	
5.1	**Alaska ensures that appropriate research is conducted into all aspects of fisheries including biology, ecology, technology, environmental science, economics, social science, aquaculture and nutritional science (NMFS, ADFG, ASMI). The research shall be disseminated accordingly. States shall also ensure the availability of research facilities and provide appropriate training, staffing and institution building to conduct the research.** Alaska's pollock fisheries are managed by the ADFG in waters from 0-3 miles from shore, and by the National Marine Fisheries Service in waters 3-200 miles. Federally managed pollock fisheries account for 99% of the harvest in Alaska. With passage of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) in 1976, management jurisdiction occurs out to 200 miles. MSFCMA sets out ten national standards for fishery conservation and management (16 U.S.C. §	

	1851), with which all fishery management plans must be consistent (see http://www.nmfs.noaa.gov/sfa/magact/mag3.html#s301). Guided by these standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the AFSC. The mission of the AFSC is to plan, develop, and manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence. The AFSC operates the following laboratories and Divisions. The Auke Bay Laboratories conducts scientific research on fish stocks, fish habitats, and the chemistry of marine environments. Information from this research is widely used by commercial interests such as fishing industries, and governmental agencies involved in managing natural resources. The National Marine Mammal Laboratory conducts research on marine mammals, with particular attention to issues related to marine mammals off the coasts of Oregon, Washington and Alaska. Information is provided to various U.S. governmental and international organizations to assist in developing rational and appropriate management regimes for marine resources under NOAA's jurisdiction. 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 Division is responsible for training, briefing, debriefing and oversight of observers who collect catch data onboard fishing vessels and at onshore processing plants and for quality control/quality assurance of the data provided by these observers. The Resource Assessment and Engineering Division (RACE) conducts fishery surveys to measure the distribution and abundance of approximately 40 commercially important fish and crab stocks. Data derived from these surveys are supplied to fishery managers and agencies and to the commercial fishing industry. The Resource Ecology and Fisheries Management Division (REFM) collects data to support management of Northeast Pacific and eastern Bering Sea fish and crab resources. Stock assessments are developed annually and used to set catch quotas. Division scientists also evaluate how fish stocks and user groups might be affected by fishery management actions. http://www.afsc.noaa.gov/generalinfo/divisions.htm Scientists at the AFSC conduct research and stock assessments on pollock in Alaska each year. This includes data collection and analysis to support an ecosystem approach to management of Northeast Pacific and eastern Bering Sea fish and crab	

	resources. More than twenty-five groundfish and crab stock assessments are developed annually and used by the NPFMC to set catch quotas. In addition, economic and ecosystem assessments are provided to the NPFMC on an annual basis. Division scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate. Fishery information is available regarding trawl catcher and catcher/processor vessel fishing activities that target pollock in the BSAI and GOA. Records of catch and effort for these vessels are collected by observers and by vessel captains in voluntary and required logbooks. Fishery data from the Observer Program are available since 1990. Extensive at-sea and shorebased sampling programs allow the annual estimation of the size and age composition of the catch, an essential input to the stock assessment and associated research effort. Catch, effort, age, length, weight, and maturity data are collected during pollock trawl and acoustic surveys. These surveys provide an accurate index of pollock abundance, size, and age composition. State management occurs from 0-3 miles from the coastline. The state of Alaska establishes seasons and Guideline Harvest Levels (GHL) through the Alaska Board of Fisheries process. State scientists, managers and regulators determine research priorities during annual Policy and Planning Committee (PPC) meetings. The PPC is comprised of Headquarters' upper level staff, as well as regional supervisors for Alaska's major fishing regions, and senior scientists. The department undertakes assessment surveys as well. The National Environmental Policy Act (NEPA) requires preparation of EISs for major Federal actions significantly affecting the quality of the human environment. NEPA regulations state: "Environmental impact statements may be prepared, and are sometimes required, for broad Federal actions such as the adoption of new agency programs or regulations" (40 CFR 1502.4). NMFS has determined that the new management programs mandated by the AFA and proposed to be implemented under Amendments 61/61/13/8 are of sufficient magnitude to warrant preparation of a separate EIS for these amendments. NEPA is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic sphere of fisheries. http://www.federalregister.gov/articles/2000/04/06/00-8576/fisheries-of-the-exclusive-economic-zone-off-alaska-amendments-6161138-to-implement-major-provisions ASMI is a public-private partnership between the State of Alaska and the Alaska seafood industry established to foster economic development of a renewable natural resource. ASMI is playing a key role in the repositioning of Alaska's seafood industry as a competitive market-driven food production industry. Its work to boost the value	

	of Alaska's seafood product portfolio is accomplished through partnerships with retail grocers, foodservice distributors, restaurant chains, foodservice operators, universities, culinary schools, and the media. It conducts consumer campaigns, public relations and advertising activities, and aligns with industry efforts for maximum effectiveness. ASMI also functions as a brand manager of the Alaska Seafood family of brands (http://pressroom.alaskaseafood.org/about/).	

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
5.1.1	**An appropriate institutional framework (*National Standard Guidelines for Fishery Management Plans* published by the NMFS) is 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 (SAFE reports).** The *National Standard Guidelines for Fishery Management Plans* published by the NMFS require that a SAFE report be prepared and reviewed annually for each FMP. The SAFE report summarizes the best available scientific information concerning the past, present, and possible future condition of the stocks, marine ecosystems, and fisheries that are managed under Federal regulation. It provides information to the Councils for determining annual harvest levels from each stock, documenting significant trends or changes in the resource, marine ecosystems, and fishery over time, and assessing the relative success of existing state and Federal fishery management programs. The SAFE reports are published in three sections: a "Stock Assessment" section, which comprises the bulk of this document, and "Economic Status of Groundfish Fisheries off Alaska" and "Ecosystem Considerations" sections, which are bound separately. (BSAI SAFE report 2010) The adequacy and appropriateness of the stock assessments are ensured by extensive peer review. For BSAI and GOA groundfish assessments, the review process begins with an internal review of assessments by the AFSC. Following that review, assessments are reviewed annually by the groundfish plan teams who provide comments to the assessment authors on revisions to the assessment as well as to make recommendations to the NPFMC Scientific and Statistics Committee (SSC) regarding OFL and ABC levels for each stock. The majority of the plan team members have expertise in stock assessment and fisheries biology with some additional members bringing in expertise in fishery management, in-season catch accounting, seabirds, marine mammals, and economics. The assessments as well as the plan team recommendations are then subsequently reviewed by the SSC who make the final OFL and ABC recommendations to the Council. The SSC may modify the recommendations from the Plan Team based upon additional considerations, such as	

	large increases in ABC due to a new assessment model whereby the SSC has recommended a precautionary stair-step procedure to increase the ABC over a period of multiple years rather than abruptly in one year. The Council sets total allowable catch (TAC) levels at or below the ABC recommendations of the SSC. 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. CIE recommendations are provided to the stock assessment author, the AFSC, the plan team, and the SSC for review, comment, and consideration of priorities for improving the assessment. (SSCWorkshop10.pdf) Three external reviewers from the Center of Independent Experts (CIE) were contracted to review assessments of Atka mackerel and pollock for the AI region in June 2008. The terms of reference covered several aspects of the assessments including the use of fishery dependent and fishery independent data, gaps in modeling, accounting for assessment uncertainties, analysis of growth, migration, and abundance variation among regions. NMFS respond to the review and incorporated it into their 2008 assessment cycle. http://www.afsc.noaa.gov/refm/Docs/2008/Response_CIE_Reviews.pdf A team from the CIE also reviewed the EBS pollock assessment in 2010. The review was wide in scope, covering data inputs, stock assessment, regional and pollock-specific harvest strategies, and ecosystem issues. A number of recommendations were made with respect to data inputs; knowledge of biology; stock assessment; the harvest strategy used by the North Pacific Fishery Management Council; and the appropriateness of the harvest strategy within an ecosystem context. The recommendations generally point to possible work which at a minimum should clarify issues and provide greater confidence as to the utility of information provided. ftp://ftp.afsc.noaa.gov/afsc/public/pollock/CIE/	

Clause:

5.2 The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration shall be monitored.

Eco 31

5.2.1 The research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems shall be established. The state of the stock under State Jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration shall be established.

FAO CCRF 12.5

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
5.2	**The state of the stocks under management jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration is monitored (SAFE, Ecosystems SAFE reports).** Stock assessments are conducted annually on the GOA and BSAI pollock in Alaskan waters. The assessments include current and historical data on catch, catch age composition, and fishery independent indices of abundance and population age composition. Assessment outputs include historical estimates of population abundance, spawning stock biomass, recruitment, population age composition and fishing mortality. Catch projections are used to estimate future fishery yields under pre-agreed harvest rules in accordance with national standards, as well as to estimate the impact of these catches on the populations. The historical time series are used to evaluate the performance of the management regime in relation to management objectives. The assessments include sections on ecosystem considerations such as preventing overfishing, avoiding habitat degradation, minimizing incidental by-catch, controlling discards, and multi-species trophic interactions. Ecosystem SAFE reports are also published annually by the NMFS. The Alaska Department of Environmental Conservation (DEC) implements statutes and regulations affecting air, land and water quality. DEC is the lead state agency for implementing the federal Clean Water Act and its authorities provide considerable opportunity to maintain high quality fish and wildlife habitat through pollution prevention. Alaskan waters are relatively free of industrial pollutants, which are aggressively monitored by the DEC. These include wastewater discharge, storm water discharge, seafood water discharge, placer mining discharge, log transfer discharge, and others. (http://www.dec.state.ak.us/).	

	As mandated by the United States Clean Water Act, each state must develop a program to monitor and report on the quality of its surface and groundwaters and prepare a report describing the status of its water quality. The 2010 Integrated Report produced by DEC is a statewide water quality assessment. It describes whether the existing condition of each Alaska waterbody is sufficient to maintain multiple designated uses of that waterbody. Alaska water quality standards designate seven uses for fresh waters (drinking water; agriculture; aquaculture; industrial; contact recreation; non-contact recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife) and seven uses for marine waters (aquaculture; seafood processing; industrial; contact recreation; non-contact recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting raw mollusks or other raw aquatic life for human consumption). Sources of information used by DEC to develop the biannual water quality assessment include monitoring data (e.g., water testing), professional knowledge, and evaluations such as those provided by water resource managers, fish and wildlife biologists, and aquatic biologists. Alaska is rich in water quantity, water quality, and aquatic resources; almost half of the total surface waters of the United States are located within the state. Because of the size, sparse population, and remote character of Alaska, the vast majority of its water resources are in pristine condition. More than 99.9% of Alaska's waters are considered unimpaired. Among the state's vast water resources are more than 3 million lakes, 714,000 miles of streams and rivers, 44,000 miles of coastline, and approximately 174,683,900 acres of wetlands. Less than 0.1% of these water resources have been identified as impaired. DEC actively solicits all existing and readily available water quality data and information in accordance with EPA guidance. The information gathered is not limited to waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions. Organizations and groups are contacted for research they may be conducting or reporting. University researchers, the U.S. Department of Agriculture, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the U.S. Fish and Wildlife Service (USF&WS) are examples of such sources of field data. http://dec.alaska.gov/water/index.htm The ADFG protects estuarine and marine habitats primarily through cooperative efforts involving other state and federal agencies and local governments. The Department of Natural Resources (DNR) manages all state-owned land, water and natural resources except for fish and game. This includes most of the state's tidelands out to the three mile limit and approximately 34,000 miles of coastline. DNR authorizes the use of log-transfer sites, access across state land and water, set-net sites for commercial gill net fishing, mariculture sites for shellfish farming, lodge sites and access for the tourism industry, and water rights and water use authorizations. DNR also uses the state Endangered Species Act to preserve natural habitat of species or subspecies of fish and wildlife that are threatened with extinction (http://dnr.alaska.gov/).	

	The Alaska pollock fishery is conducted exclusively with pelagic trawls that are not in constant contact with the ocean floor. Beginning in 1990 88% of the catch was allocated to pelagic gears and in 1999 the use of bottom trawls was prohibited. Pelagic trawls have much less impact on benthic fish habitats than bottom trawls. In its 2002 review of the effects of trawling on seafloor habitat, the US National Research Council did not consider pelagic trawls since their impact on bottom habitat was minimal. Research on the effects of climate or environment change on fish stocks and aquatic ecosystems is discussed further in section 13.1.2.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
5.2.1	**The research capacity necessary to assess the effects of climate or environment change on fish stocks and aquatic ecosystems, the state of the stock under Alaska's jurisdiction, including the impacts of ecosystem changes resulting from fishing pressure, pollution or habitat alteration are established (SAFE, Ecosystems SAFE reports).** The NMFS AFSC conducts research and data collection to support an ecosystem approach to management of GOA and EBS fish and crab resources. This ecosystem approach examines climate and/or environmental changes. More than twenty-five groundfish and crab stock assessments are developed annually and used by the NPFMC to set catch quotas. In addition, economic and ecosystem assessments are provided to the Council on an annual basis. Scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate. REFM scientists in the Status of Stocks and Multispecies Assessments (SSMA) program use biological and oceanographic information coupled with numerical simulation techniques to study the interaction of fish populations, fisheries, and the environment. The Fishery Interaction Team of SSMA conducts field studies to examine potential commercial fishery impacts on prey including reduction in the abundance or availability of prey at local scales and disturbance of prey fields. Ecosystem assessments and information and multispecies and ecosystem models on the relationship between predators and prey developed by the Division's Resource Ecology and Ecosystem Modeling staff also contribute to management advice. The Age and Growth program is primarily focused on providing age data that contributes to a basic understanding of a species, whether it is in the context of sustainable fisheries, species conservation, or species biology. These age data are critical to development of age-structured models and fishery management advice.	

	The Socioeconomic program staff provides economic information to NMFS, industry and other agencies to assist with such projects as evaluating the economic effects of the Exxon Valdez oil spill in Prince William Sound, developing guidelines for valuing commercial and recreational fisheries, or evaluating economic impacts of fisheries rationalization programs. Sociocultural information on Alaskan communities and traditional ecological knowledge is also compiled and evaluated. http://www.afsc.noaa.gov/REFM/ Annual results are published in the Ecosystem SAFE documents provided to the NPFMC. These reports provide a concise summary of the status of marine ecosystems in Alaska for stock assessment scientists, fishery managers, and the public. One section of the report covers Ecosystem Status and Management Indicators, and provides detailed information and updates on the status and trends of ecosystem components as well as either early signals of direct human effects on ecosystem components that might warrant management intervention or to provide evidence of the efficacy of previous management actions. In the first instance, the indicators are likely to be ones that summarize information about the characteristics of the human influences (particularly those related to fishing, such as catch composition, amount, and location) that are influencing a particular ecosystem component. A major component of the report is an ecosystem assessment that synthesizes historical climate and fishing effects on the eastern Bering Sea/Aleutian Islands and Gulf of Alaska ecosystems using information from the Ecosystem Status and Management Indicators section and stock assessment reports. Notable trends that capture unique occurrences, changes in trend direction, or patterns across indicators are highlighted. An ongoing goal is to produce an ecosystem assessment utilizing a blend of data analysis and modeling to clearly communicate the current status and possible future directions of ecosystems. (Ecosystem SAFE document)	

Clause:		
5.3	**Management organizations shall cooperate with relevant international organizations to encourage research in order to ensure optimum utilization of fishery resources.** ***FAO CCRF 12.7***	
Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	Evidence	
5.3	**Management organizations cooperate with relevant international organizations (US-Russia Governments) to encourage research in order to ensure optimum utilization of fishery resources.** Since the late 1980's, Alaskan the Alaska pollock fishery has been conducted solely by US vessels and all the monitoring activities have been conducted by US research and management organizations. The US acoustic trawl survey has been designed to survey the entire population and thus crosses the international border. Permission to do this is obtained from the Ministry of Foreign Affairs of the Russian Federation. (Pollock Assessment Bering Sea Alaska-Russia 2010.pdf). Research results on Alaskan pollock and the north Pacific ecosystem are exchanged at meetings of the North Pacific Marine Science Organization (PICES). This organization has members from the US, Russia, Japan, and Canada, countries with scientific interest in pollock.	

Clause:		
5.4	**The fishery management organizations shall directly, or in conjunction with other States, develop collaborative technical and research programmes to improve understanding of the biology, environment and status of trans-boundary aquatic stocks.** ***FAO CCRF 12.17***	
Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	Evidence	
5.4	**Alaska's fishery management organizations in conjunction with Russia, develop collaborative technical and research programmes to improve understanding of the biology, environment and status of pollock.** 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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. (See section 1.2).	

Clause:

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

5.5.1 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.

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

FAO CCRF 12.3

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
5.5	**Data generated by research is analyzed and the results of such analyses published in a way that confidentiality is respected (NOAA administrative order 216-100) where appropriate.** NOAA administrative order 216-100 prescribes policies and procedures for protecting the confidentiality of data submitted to and collected by the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS). Confidential data are those identifiable with a person. Before release to the public, data must be aggregated to protect the individual identities. For fisheries data, this requires that there must be at least 3 entities contributing to any level of aggregated data. Only authorized users have access to confidential data, they must have a need to collect or use these data in the performance of an official duty, and they must sign a statement of nondisclosure affirming their understanding of NMFS obligations with respect to confidential data and the penalties for unauthorized use and disclosure. Confidential data must be maintained in secure facilities. Data collected by a contractor, such as an observer contractor, must be transferred timely to authorized Federal employees; no copies of these data may be retained by the contractor. NMFS may permit contractors to retain aggregated data. A data return clause shall be included in the agreement. All procedures applicable to Federal employees must be followed by contractor employees collecting data with Federal authority. Under	

	agreements with the State, each State data collector collecting confidential data will sign a statement at least as protective as the one signed by Federal employees, which affirms that the signer understands the applicable procedures and regulations and the penalties for unauthorized disclosure.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
5.5.1	**Results of analyses are distributed in a timely and readily understandable fashion (yearly SAFE reports) in order that the best scientific evidence is made available as a contribution to fisheries conservation, management and development.** Annual stock assessment, economic and ecosystem SAFE documents are made available through the NPFMC and NMFS on an annual basis. A variety of other studies and documents are placed on these organizations websites on a regular basis.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
5.5.2	**In the absence of adequate scientific information, appropriate research is initiated in a timely fashion.** The annual stock assessments are peer reviewed by experts and recommendations are made to improve the assessments through directed research. These recommendations are made by the assessment Plan teams, the SSC, and during periodic CIE reviews. The recommendations from previous meetings are highlighted in the introductions of the assessment SAFE documents and progress on recommended research is noted.	

Clause:

5.6 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 7.4.3

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
5.6	**Studies are promoted which provide an understanding of the costs, benefits and effects of alternative management options designed to rationalize fishing, in particular, options relating to excess fishing capacity and excessive levels of fishing effort (NEPA process).** The National Environmental Policy Act (NEPA) requires preparation of EISs for major Federal actions significantly affecting the quality of the human environment. NEPA regulations state: "Environmental impact statements may be prepared, and are sometimes required, for broad Federal actions such as the adoption of new agency programs or regulations" (40 CFR 1502.4). NMFS determined that the new management programs mandated by the AFA and proposed to be implemented under Amendments 61/61/13/8 were of sufficient magnitude to warrant preparation of a separate EIS for these amendments. The current rationalized pollock fishery presents evidence of reduced fishing capacity. NEPA is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic sphere of fisheries. http://www.federalregister.gov/articles/2000/04/06/00-8576/fisheries-of-the-exclusive-economic-zone-off-alaska-amendments-6161138-to-implement-major-provisions	

Clause:
5.7 In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.
FAO CCRF 7.6.7
Evidence adequacy rating:
☑ **High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
5.7	**In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact are considered (NEPA processes).** **See 5.6**	

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 target. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded. ***FAO CCRF 7.5.2/7.5.3*** ***Eco 29.2/29.2bis/30-30.2***						
Confidence Ratings	**Low**	**0 out of 6**	**Medium**	**0 out of 6**	**High**	**6 out of 6**

Clause:

6.1 States shall determine for the stock both safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded.

6.1.1 Target reference point(s) shall be established.

6.1.2 Limit reference points shall be established. When a limit reference point is approached, measures shall be taken to ensure that it will not be exceeded.

6.1.3 Data and assessment procedures shall be installed measuring the position of the fishery in relation to the reference points. Accordingly, the level of fishing permitted shall be commensurate with the current state of the fishery resources.

FAO CCRF* 7.5.3, *7.6.1

FAO Eco 29.2-29.2bis,29.6,30-30.2

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

FAO CCRF 7.5.3

FAO Eco 29.6, 30.2

6.1.5 In implementing the precautionary approach, States shall take into account, inter alia, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points , levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non-target and associated or dependant species as well as environmental and socio-economic conditions.

FAO CCRF 7.5.2

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence
6.1	**Alaska's fisheries management organizations determine, for the stock in question, safe targets for management (Target Reference Points) and limits for exploitation (Limit Reference Points), and, at the same time, the action to be taken if they are exceeded.** National Standard 1 of the MSA, passed in 1976, required that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. 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 F_{OFL}, 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. New statutory requirements were established under the MSA in 2006 to end and prevent overfishing by the use of annual catch limits (ACL) and accountability measures. The measures were required to be implemented for all stocks subject to overfishing by 2010 and for the rest of the stocks by 2011. The groundfish management plans for the BSAI and the GOA include harvest control rules designed to determine ACLs. The harvest control rule is designed to prevent overfishing by establishing a maximum fishing mortality threshold and using this to determine annual catch limits. Stock assessments estimate a series of catches. The overfishing limit (OFL) is the catch level above which overfishing is occurring. The 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. The ABC is set below the OFL. The annual catch limit (ACL) is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures. The ACL cannot exceed the ABC, and may be divided into sector-ACLs. The 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 (i.e., uncertainty in the ability of managers to constrain catch so the ACL is not exceeded, and uncertainty in quantifying the true catch amount). Stocks are assigned to 1 of 6 tiers depending on the level of knowledge about stock productivity and the ability to estimate specific biological reference points. The EBS pollock stock is in tier 1 where information is abundant enough and compelling enough to determine the statistical distribution of maximum sustainable yield. This requires a reliable stock-recruitment relationship whereby the number of age 1 fish (recruits) entering the populations may be predicted based on the biomass of spawning pollock. In this case, it is possible to estimate of the probability distribution of the biomass at maximum sustainable yield (B_{MSY}) and a probability distribution of the fishing mortality associated with MSY (F_{MSY}). Stocks are assigned to tier 2 if there are only point estimates of these reference points. If there is not a reliable stock-recruitment relationship, but there is enough information to calculate a spawner per recruit

function, the stocks are assigned to tier 3. In this case, a fishing mortality designation of the form "$F_{X\%}$" 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. The term $B_{40\%}$ refers to the long-term average biomass that would be expected under average recruitment and $F=F_{40\%}$. GOA pollock are assigned to tier 3. The suitability of the proxy reference points used in tier 3 has been the subject of considerable research (Clark 1991, Restrepo 1999). Tier 4 stocks are those for which per-recruit fishing mortality estimates can be made but for which there is not an adequate basis to estimate average recruitment. For tier 5 stocks there is only knowledge of stock biomass and natural mortality. And, for tier 6 stocks there is only knowledge of historical catches.

(EBS and GOA Groundfish management plans)

The NPFMC commissioned an independent scientific review of their harvest strategy for the BSAI and GOA groundfish fisheries, with particular attention to the role played by the *F40%* reference point, and to determine whether changes should be made to be in accordance with the National Standards of the MSA (Goodman et al. 2002). The panel concluded that the proxy reference points are defensible and that the specific values used are supported by a body of scientific literature as being reasonable proxies for "typical groundfish" species like Alaska pollock. They also concluded that management system contained in the groundfish FMPs is generally consistent with the single-species/target-stock components of the MSA. They also recommended that the robustness of the management system be tested through simulations in an approach commonly referred to as a management strategy evaluation (MSE). The review panel acknowledged that this is a time-consuming and technically difficult undertaking requiring a significant commitment of scientific resources. A similar recommendation was made in the 2009 CIE review of the EBS pollock stock assessment. The analysis has not yet been undertaken.

Clark, W.G. 1991. Groundfish exploitation rates based on life history parameters. Can. J. Fish. Aquat. Sci 48: 734-750.

Goodman, D. et al. 2002. Scientific review of the harvest strategy currently used in the BSAI and GOA groundfish management plans. Prepared for the NPFMC November 21, 2002.

Restrepo, V. (ed.) 1999. Proceedings of the fifth national NMFS Stock Assessment Workshop: Providing scientific advice to implement the precautionary approach under the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Tech. Memo. NMFS-F/SPO-40.

Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	Evidence
6.1.1	**Target reference point(s) are established.** **(see below)**

Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	Evidence
6.1.2	**Limit reference points are established. When a limit reference point is approached, measures are available to ensure that it will not be exceeded.** The fishing mortality that corresponds with the OFL (F_{OFL}) is considered a limit reference point because the annual catch limit is never set at a level that would exceed the OFL and thus result in overfishing. The biomass associated with MSY (B_{MSY}), or its proxy $B_{40\%}$ in the case of tier 3 stocks is a target reference point since is is the desired stock condition. For tier 1, 2, and 3 stocks, F_{OFL} also varies with stock size. When the stock size is above the target, the F_{OFL} is set to F_{MSY} for tier 1 and $F_{35\%}$ for tier 3. When the stock size is below a critical level, the F_{OFL} is set to 0. By default, this critical level is 5% of the estimated unexploited stock biomass, but this value may vary if the best scientific information suggests an alternative. When the stock size is between the target and the critical level, the F_{OFL} is set along a straight line between the target and the critical level. This is illustrated in Figure 6.1 here below.

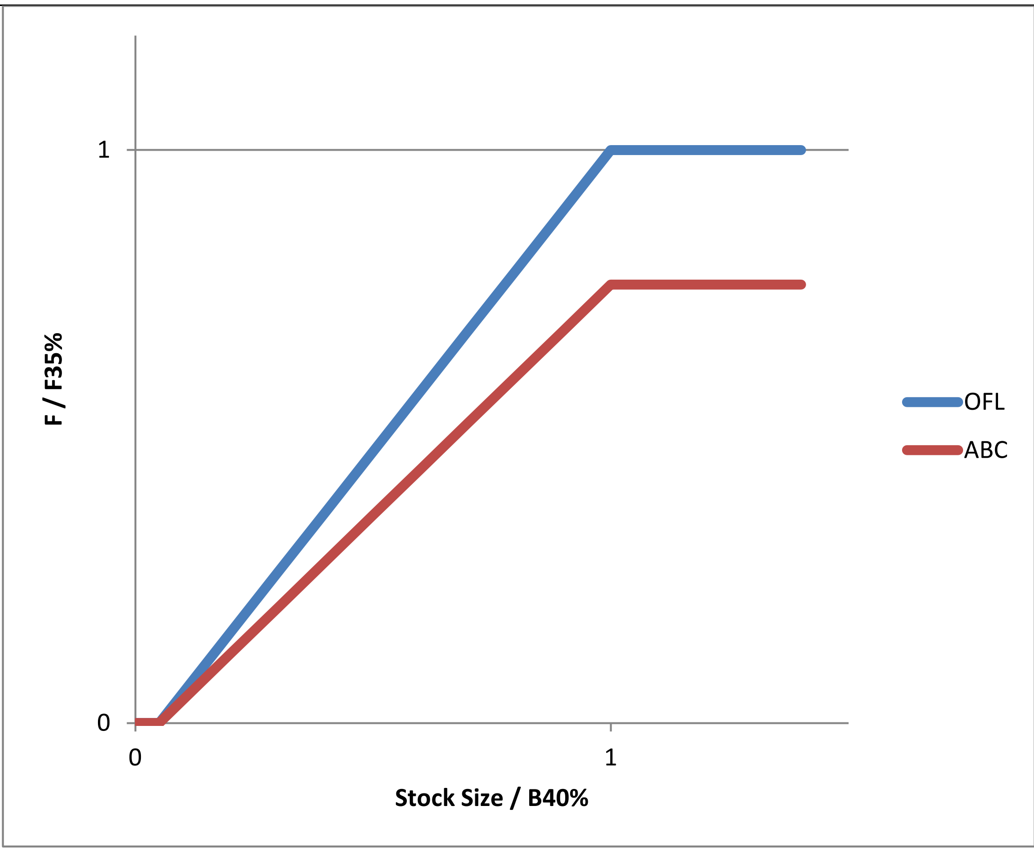


Figure 6.1: Harvest control rule for BSAI and GOA groundfish for tier 3 stocks. For tier 1 stocks, substitute BMSY for $B_{40\%}$ and FMSY for F35%.

As noted above, the ABC is set below the OFL in order to account for the uncertainty in estimating the OFL and other scientific uncertainty to ensure that overfishing does not occur. There are different rules used depending on the assigned stock tier. For tier 1 stocks, the F_{OFL} is set at the arithmetic mean of the probability density function (pdf) of the pdf of the F_{MSY} while the F_{ABC} is set at the harmonic mean of the pdf. The harmonic mean of a series of numbers is always less than the arithmetic mean. For tier 3 stocks, F_{OFL} is set at $F_{35\%}$ and the F_{ABC} is set at $F_{40\%}$. $F_{40\%}$ is always less than $F_{35\%}$. These reference points are always used when the assessment Plan teams formulate catch advice. The assessment authors also have the latitude to suggest alternative catch advice if they consider it relevant.

The most recent catch advice from the EBS pollock plan team is shown in Table 6.1. This is a tier 1 stock and therefore the reference points are based on MSY. The advice from the previous assessment is compared to that from the most recent assessment. It was noted that the 2010 estimate of stock size was considerably higher than that made in 2009 because of higher than expected AT survey estimates in 2010 and the appearance of a strong 2008 year-class. The estimated total biomass in 2011 made in the 2009 assessment was 6,223,300 t while it was 9,620,000 t in 2010. There was a corresponding increase in the OFL for 2011 from 1,220,000 t to 2.447,000 t. The assessment authors noted a number of concerns about such a large change in advice:

- The anticipated proportion of catch comprising just 5 year olds in 2011 is high (~49% numerically and 51% by weight).
- In 2010, the proportion of a single age class contributing to the spawning

biomass is estimated to have been the highest since from 1990-2015.

- About 50% of the biomass change between last year's estimate for age-cumulative biomass is due to the revision of the 2006 year class estimate and hence places a high degree of reliance on the 2010 surveys.
- The 2010 BTS pollock biomass estimate ranks 19th out of 24 surveys since 1987 and is below average.
- The AT survey pollock biomass ranks 9th out of 17 surveys conducted since 1980 and is also below average.
- The catch west of 170°W has averaged 580 kt from 2005-2010 whereas the long term average (1979-2010) is 413 kt. There may be some spatial catch disparity beyond what is anticipated due to the population age structure (with younger fish general further north and west).
- The spatial distribution of the 2010 A-season fishery was unusual and may indicate a shift in the contribution of spawning pollock from different areas and parts of the "normal" season.
- The unintended catch of 2008 year class (three year olds) may be higher than indicated by the assumed selectivity-at-age.
- The AT survey indicates the third lowest percentage of fish (in biomass) of pollock aged 3 and older based on 2010 data (this is partly due to the relatively high apparent abundance of 2 year olds).
- The fishery would presumably benefit by improved catch rates over broader regions, particularly for shore-based catcher vessels if the stock abundance is allowed to increase more.
- The biomass observed in the Navarin region in the Russian zone remains relatively low
- The Biological opinion has identified that the increases in Steller sea lions are below standards in some areas.
- Estimates of the 2008 (and 2009) year class are highly uncertain.

The authors then recommended an alternative F_{ABC} that would result in a more gradual increase in fishing mortality than the prescribed ABC, and based on the average fishing mortality. The difference in forecast fishing mortality is shown in Table 6.2 as $maxF_{ABC}$ = 0.564 and the recommended F_{ABC} = 0.332.

Table 6.1: Summary results for EBS pollock (2010 EBS Pollock SAFE)

Quantity/Status	Last year 2010	Last year 2011	This year 2011	This year 2012
M (natural mortality, age 3+)	0.3	0.3	0.3	0.3
Specified/recommended Tier	1a	1a	1a	1a
Projected total biomass (ages 3+)	4,615,500 t	6,223,300 t	9,620,000 t	11,318,000 t
Female spawning biomass (t)				
Projected	1,316,000 t	1,588,000 t	2,444,500 t	3,019,500 t
B_0	4,934,000 t	4,934,000 t	5,140,000 t	5,140,000 t
B_{msy}	1,863,000 t	1,863,000 t	1,948,000 t	1,948,000 t
F_{OFL}	0.649	0.649	0.640	0.640
$maxF_{ABC}$	0.389	0.476	0.564	0.564
Specified/recommended F_{ABC}	0.389	0.476	0.332	0.332
Specified/recommended OFL (t)	918,000 t	1,220,000 t	2,447,000 t	3,170,000 t
Specified/recommended ABC (t)	813,000 t	1,109,000 t	1,267,000 t	1,595,000 t
Is the stock being subjected to overfishing?	No	n/a	No	n/a
Is the stock currently overfished? Is the stock approaching a condition of being overfished?	No		No	

The most recent catch advice from the GOA pollock plan team is shown in Table 6.2. This is a tier 3 stock and therefore the reference points are based on spawner per recruit reference points (e.g. $B_{X\%}$ and $F_{X\%}$). The assessment results indicated that the current stock size was in the range between the critical and target level, and thus the fishing mortality used in the catch forecast should be reduced. The estimated 2011 OFL was 118,030 t, the estimated ABC (following the prescribed tier 3 rule) was 102,940 t. The author recommended a slightly more conservative ABC rule that had a higher target biomass and this resulted in a recommended ABC of 88,620 t.

Table 6.2: Summary results for EBS pollock (2010 GOA Pollock SAFE).

Quantity/Status	Last year 2010	Last year 2011	This year **2011**	This year 2012
M (natural mortality)	0.3	0.3	**0.3**	0.3
Specified/recommended Tier	3b	3b	**3b**	3b
Projected biomass (ages 3+)	754,104	840,061	**893,700**	988,580
Female spawning biomass (t)				
Projected	184,567	204,417	**198,767**	227,345
$B_{100\%}$	620,000		**690,000**	
$B_{40\%}$	248,000		**276,000**	
$B_{35\%}$	217,000		**242,000**	
F_{OFL}	0.19	0.21	**0.16**	0.18
$maxF_{ABC}$	0.17	0.18	**0.14**	0.16
Specified/recommended F_{ABC}	0.14	0.16	**0.12**	0.14
Specified/recommended OFL (t)	103,210	135,010	**118,030**	151,030
Specified/recommended Max. Permissible ABC (t)	89,800	114,360	**102,940**	127,990
Specified/recommended ABC (t)	77,150	101,50	**88,620**	114,054
Is the stock being subjected to overfishing?	No		**No**	
Is the stock currently overfished?	No		**No**	
Is the stock approaching a condition of being overfished?	No		**No**	

The ability of assessment authors and Plan Teams to recommend departures from the prescriptive ABC rule in cases where annual assessment results are considerably different than those of previous years, and where the strict application of the ABC rule may result in harm to the stock in question due to uncertainties in the

	assessment results, is an additional conservation benefit to the management regime. In doing so, the Plan Teams must provide scientific justifications for such departures. However, the current approach is *ad hoc* and it may be beneficial to further investigate modifying the decision rules to explicitly allow for such considerations. Another limit reference point used in managing groundfish in the BSAI and GOA is the optimum yield (OY). The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within a given range. The range for BSAI is 1.4 to 2.0 million mt; the range for GOA is 116 to 800 thousand mt. In practice, only the upper OY limit in the BSAI has been a factor in altering harvests. Because of high productivity, Acceptable Biological Catches (ABCs) in the BSAI have summed to well above 2.0 million metric tons for several years. Some people believe this OY limit has been the main reason that the fisheries in the BSAI have held up so well. The lower limits in both the BSAI and the GOA have never been approached in recent time, so they have not received recent attention. In addition 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. However, this does not change the specification of ABC or OFL. (EBS and GOA Groundfish management plans)	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
6.1.3	**Data and assessment procedures are installed measuring the position of the fishery in relation to the reference points. Accordingly, the level of fishing permitted is commensurate with the current state of the fishery resources.** The harvest control rule used for BSAI and GOA groundfish scales the level of fishing according to the status of the stock (Figure 6.1). The highest level of fishing ever permitted is that which will produce MSY, or its proxy. When the stock size declines below its target or BMSY, or its proxy, the level of fishing is reduced. When the stock size declines to below a critical level, fishing is ceased. The status of both the EBS and GOA pollock populations is monitored relative to this harvest control rule. With the exception of the period 1977 – 1980, the fishing mortality of EBS pollock stock has been below the OFL and the spawning biomass has usually been above B_{MSY} (Figure 6.2). The stock current status is that the stock is not overfished and overfishing is not occurring.	

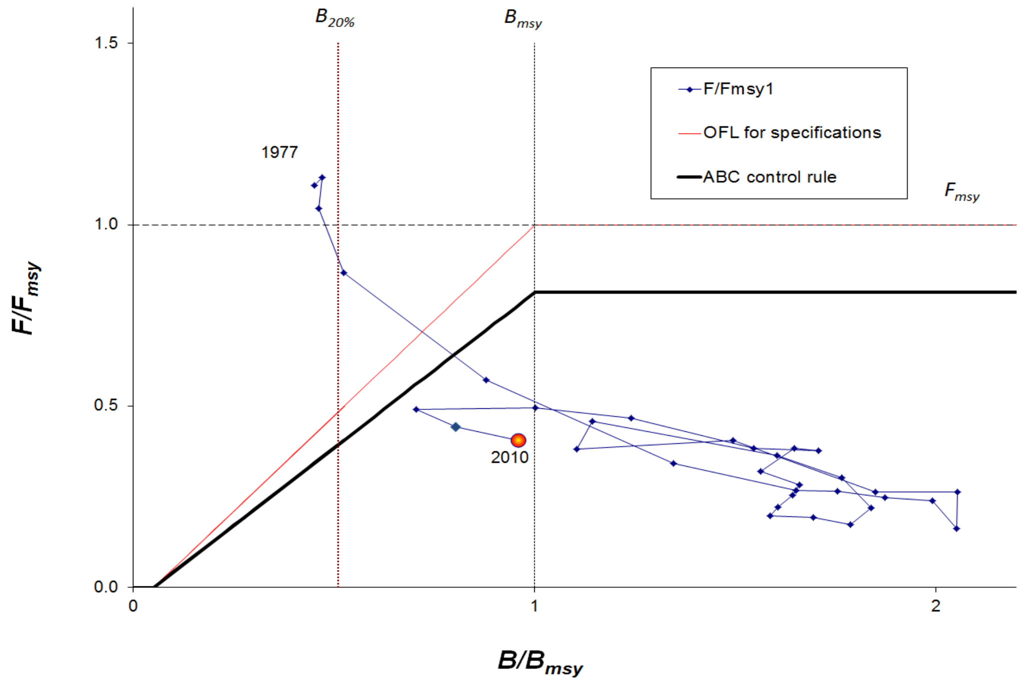


Figure 6.2: Estimated spawning biomass relative to annually estimated FMSY values and fishing mortality rates for ESB pollock. Figure 1.38 in the 2010 EBS SAFE document.

The history of the GOA pollock stock is somewhat difficult to interpret because of temporal changes in weights at age and fishery selectivity that result in temporal changes in the reference points used to measure status. The trajectory of stock size and fishing mortality based on current values of weight at age and selectivity is shown in Figure 6.3. Based on the figure, the stock was rarely above the OFL indicating that overfishing was generally not occurring. It was also usually above the $B_{20\%}$ overfished reference point. When the stock was either overfished or subject to overfishing, remedial steps were taken to reduce the catches and the stock recovered.

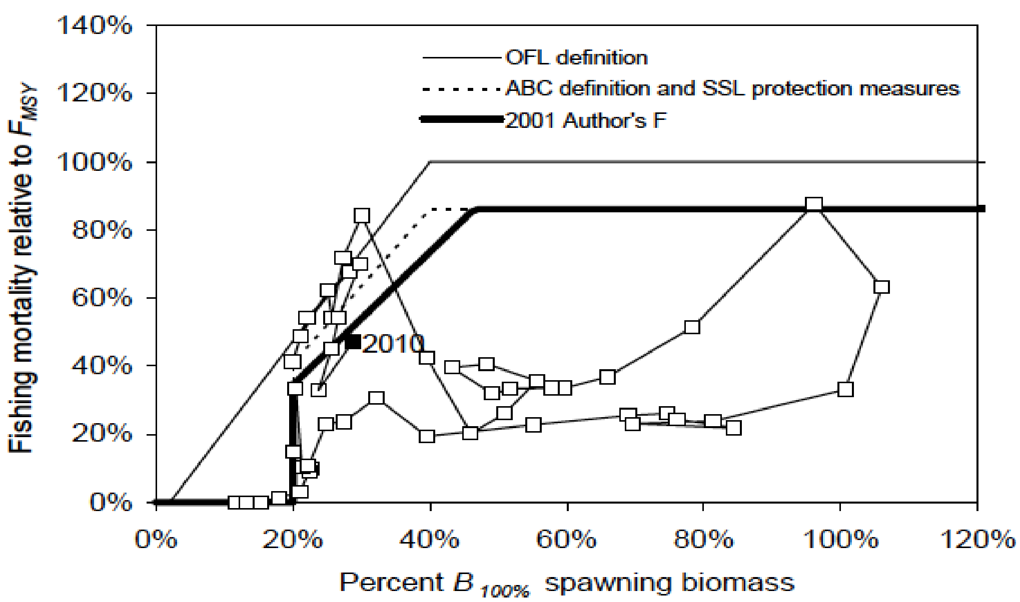


	Figure 6.3: Estimated spawning biomass relative to the unfished level and fishing mortality relative to FMSY (1961-2010) for GOA pollock. From the 2010 GOA SAFE document.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
6.1.4	**Management actions are agreed (HCR in FMPs) in the eventuality that data sources and analyses indicate that these reference points have been exceeded.** The harvest control rule used for groundfish in the BSAI and GOA are described in detail in the groundfish management plans. They are prescriptive, they adjust harvest rates and annual catch limits in response to changes in stock size in a way that favours conservation and sustainable use. Under the MSA, the annual rate of fishing must not excess of that which will give MSY on average in the long term. If the stock size falls below that associated with MSY, the maximum allowable fishing rate is reduced in order to promote rebuilding to B_{MSY} and above. If the stock size falls below a critical level, fishing must cease. In the case of Alaska pollock, additional consideration is given to the role of pollock as a food source for Steller Sea Lions, and the critical biomass level is set at 20% of the unfished stock size.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
6.1.5	**In implementing the precautionary approach, Alaska's fisheries management organizations take into account, *inter alia*, uncertainties relating to the size and productivity of the stocks, reference points, stock condition in relation to such reference points, levels and distribution of fishing mortality and the impact of fishing activities, including discards, on non target and associated or dependant species as well as environmental and socio-economic conditions**. The management system for Alaskan pollock takes all of these factors into account. The tier system for stock assessment and management is structured around differing level of uncertainty about fish stock ecology and fishing history (see section 6.1). The decision rules are based on biological reference points, both limit and target reference points (see section 6.1). The maximum permitted rate of fishing is adjusted in accordance with stock condition (Figure 6.1). Annual TACs are sub-allocated to area and seasons in order to distribute fishing across the geographic range of the stocks	

	(see section 4.1). The level of discarding is closely monitored with at-sea observers and measures are taken to reduce discarding (see section 4.1, 5.2, and 8.4). Management measures such as rolling hotpots and prohibited species catch rules were instituted to reduce the catch of Pacific Salmon species (see section 7.1). A significant portion of critical habitat for Steller Sea Lions has been closed to reduce the impact of the pollock fishery on this endangered marine mammal. The National Environmental Policy Act (NEPA) requires preparation of EISs for major Federal actions significantly affecting the quality of the human environment. NEPA is a comprehensive process to provide checks and balances against changes to the environment that may impact ecosystems and the natural processes, as well as the socio-economic sphere of fisheries.	

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 7.5.1/7.5.4/7.5.5*** ***FAO ECO 29.6/32***						
Confidence Ratings	**Low**	**0 out of 6**	**Medium**	**0 out of 6**	**High**	**6 out of 6**

Clause:

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.

FAO Eco 29.6

7.1.1 The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.

FAO CCRF 7.5.1

Eco 29.6/32

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	Evidence	
7.1	**The precautionary approach is applied widely to conservation, management and exploitation of living aquatic resources (MSA, GOA and BSAI FMPs) in order to protect them and preserve the aquatic environment.** FAO Guidelines for the Precautionary Approach (PA) (FAO 1995) advocate a comprehensive management process that includes data collection, monitoring, research, enforcement, and review. Prior identification of desirable (target) and undesirable (limit) outcomes must be carried out and measures are required that will avoid undesirable outcomes with high probability and correct them promptly should they occur. The Guidelines suggest that this be achieved through decision rules that specify in advance what action should be taken when specified deviations from operational targets are observed (i.e. harvest control rules). Furthermore, the Guidelines suggest that a management plan should not be accepted until it has been shown to perform effectively in terms of its ability to avoid undesirable outcomes (for example through simulation trials). Lastly, the absence of adequate scientific information should not be used as a reason for postponing or failing to take	

measures to conserve target species, associated or dependent species as well as non-target species and their environment.

FAO. 1995. Precautionary approach to fisheries. Part 1: Guidelines on the precautionary approach to capture fisheries and species introductions. FAO Fisheries Technical Paper 350/1 [online]. Available from http://www.fao.org/DOCREP/003/W3592E/W3592E00.HTM

Beginning at the single species level, the groundfish management plans for the BSAI and GOA include all the elements of the PA. As described in section 6, the plans are intended to promote and maintain sustainable fisheries for today and into the future. The plans have pre-defined harvest control rules that include limit and target reference points and are used to determine annual catch limits to control exploitation within sustainable bounds and to promote optimal utilisation around MSY. The harvest control rules include a variable harvest rate that is reduced if the stock falls below a target level of B_{MSY}, or its proxy of $B_{40\%}$, in order to promote stock rebuilding. The harvest rate is controlled to be below a limit reference point of F_{OFL}. F_{OFL} is maintained at a constant level of F_{MSY}, or its proxy $F_{35\%}$ when the stock size is above the target, it is reduced if the stock size falls below the target, and is set to 0 if stock size falls below a critical level. The critical level may be adjusted upward if other considerations suggest a more conservative approach is warranted. This critical level has never been approached for EBS and GOA pollock over the history of management under the MSA. This single species approach is applied to all groundfish stocks in Alaska.

(BSAI and GOA Groundfish Management Plans)

(EBS and GOA Pollock SAFE documents)

The advisory process for Alaskan pollock fisheries has measures built in to further enhance conservation. Stocks are assigned to 1 of 6 "tiers" that represent descending levels of knowledge about their ecology and fishing history. Management reference points differ among the tiers and become more conservative when knowledge is lacking. This is discussed further in section 7.1.1. The OFL is defined and monitored in order to determine whether overfishing is occurring. The ABC is defined in such a way as to take into account uncertainty regarding the OFL estimation and other uncertainties in the stock assessments. The Plan teams have the option to propose alternatives to the ABC if conditions warrant, such as additional uncertainties, recruitment variability, and declining stock trends. The ABC is always lower than the OFL. The SSC then reviews the SAFE report and Plan Team recommendation, and makes its own recommendation to the Council. The Council then reviews the SAFE report, Plan Team recommendation, and SSC recommendation; then makes its own recommendation to the Secretary, with the constraint that the Council's recommended ABC cannot exceed the SSC's recommended ABC.

(BSAI and GOA Groundfish Management Plans)

The next stage of the management process is to determine the annual total allowable catch (TAC) for each stock. The TAC must be lower than or equal to the ABC. The TAC may be lower than the ABC is warranted on the basis of bycatch considerations, management uncertainty, socioeconomic considerations, or if required to have the sum of all TACs for directed species in the ecosystem (BSAI and GOA separately) to fall within the range of the Optimum Yield (OY). In this way, the management system addresses multi-species, ecosystem, and social needs of the fishery.

In application, the NPFMC sets TAC ≤ ABC < OFL. Actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC (Figure below), because of the complex array of accountability measures governing these fisheries.

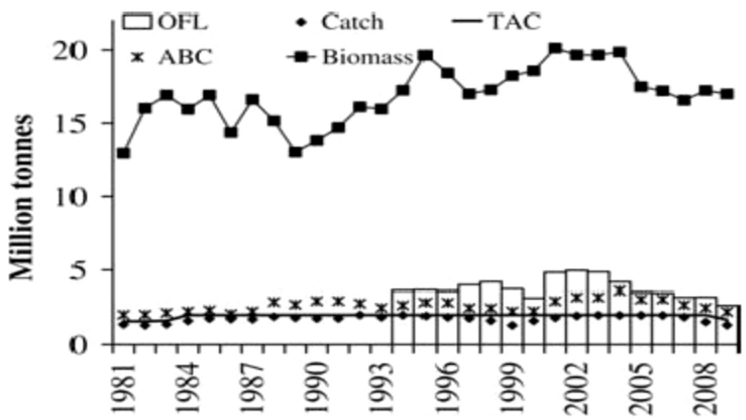


Figure 2. Cumulative estimates of biomass, overfishing level (OFL), acceptable biological catch (ABC), total allowable catch (TAC), and actual catch (all in million tonnes) across all groundfish species in the Northeast Pacific, 1981–2009.

From Dicosimo *et al*. 2010 (http://icesjms.oxfordjournals.org/content/67/9/1861.full)

Besides the MSA, US fisheries management must be consistent with the requirements of other regulations including the Marine Mammal Protection Act, the Endangered Species Act, and the Migratory Bird Treaty Act. Specific provisions appear in the groundfish management plans to protect the endangered Steller sea lion. NMFS uses Steller sea lion protection measures to ensure the groundfish fisheries off Alaska are not likely to jeopardize the continued existence of the western population of Steller sea lions or adversely modify their critical habitat. The management measures disperse fishing over time and area to protect against potential competition for important Steller sea lion prey species near rookeries and important haulouts. Currently 54% of Steller sea lion critical habitat is closed to directed pollock fishing in the BSAI and GOA areas. Catch allocation measures are also taken to control the amount of pollock catch that comes from Steller sea lion conservation areas (SCA). On the EBS shelf, an estimate (based on observer at-sea data) of the proportion of pollock caught in the SCA has averaged about 38% annually. During the"A-season" the average is about 49% (since pollock are more concentrated in this area during this period). Since 2005 the annual proportion of catch within the SCA has dropped considerably with about 30% of the catch taken in this area. However, the proportion taken in the A-season reached 57% in 2007, the highest level since 1999.

Since 1992, the GOA pollock TAC has been apportioned spatially and temporally to reduce potential impacts on Steller sea lions. The details of the apportionment scheme have evolved over time, but the general objective is to allocate the TAC to

	management areas based on the distribution of surveyed biomass, and to establish three or four seasons between mid-January and autumn during which some fraction of the TAC can be taken. The Steller Sea Lion Protection Measures implemented in 2001 established four seasons 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. Allocations to management areas 610, 620 and 630 are based on the seasonal biomass distribution as estimated by groundfish surveys. In addition, the harvest control rule for determining the ABC for pollock in the EBS and GOA requires suspension of directed pollock fishing when spawning biomass declines below 20% of the reference unfished level. This rule is meant to ensure that prey needs of Steller sea lions are met. (http://alaskafisheries.noaa.gov/sustainablefisheries/sslpm/) (EBS and GOA Pollock Safe documents) Additional management measures are also in place to reduce the bycatch of Pacific salmon (Chinook and Chum) in the pollock fisheries. Amendment 84 established in Federal regulations the salmon bycatch intercooperative agreement (ICA), which allows vessels participating in the Bering Sea pollock fishery to use their internal cooperative structure to reduce Chinook and non-Chinook salmon bycatch using a method called the voluntary rolling hotspot system (VRHS). Through the VRHS, industry members provide each other real-time salmon bycatch information so that they can avoid areas of high Chinook or non- Chinook salmon bycatch rates. The VRHS was implemented voluntarily by the fleet in 2002 and was adopted by the NPFMC in 2005. The efficacy of voluntary closures and bycatch reduction measures were reported to the NPFMC annually. While the annual reports suggest that the VRHS ICA has reduced Chinook salmon bycatch rates compared to what they would have been without the ICA, the highest historical Chinook salmon bycatch occurred in 2007, when the ICA was in effect under an exempted fishing permit. This high level of bycatch illustrated that, while the management measures implemented under Amendment 84 provided the pollock fleet with tools to reduce salmon bycatch, these measures contain no effective upper limit on the amount of salmon bycatch that could occur in the Bering Sea pollock fishery. This led to the establishment of a prohibited species catch (PSC) rule for Chinook salmon whereby the number of Chinook salmon caught in a year was limited (published in the Federal Register August 30, 2010). The PSC is allocated to entities participating in the BS pollock fishery. The Gulf of Alaska salmon bycatch is now managed using a hard cap that, if exceeded, will close the pollock fishery. (Amendment 91 Chinook bycatch management in the BS pollock fishery.pdf) Pacific salmon are taken as bycatch in the GOA groundfish fisheries, in which they are considered, prohibited. Although five species of salmon are caught in the fisheries, the Council has been concerned about Chinook salmon, as the species with the highest bycatch in recent years. Chinook salmon bycatch primarily occurs in trawl fisheries, in the central and western regulatory areas. Between 2003 and 2010, the	

	pollock target fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily nonpelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder. In 2011, the Council approved Chinook salmon prohibited species catch (PSC) limits for the GOA pollock fisheries in the central and western regulatory areas. Once these annual limits are reached, the pollock fishery in the respective regulatory area will be closed. The Council is also considering other, comprehensive management measures to address Chinook salmon bycatch in the GOA trawl fisheries. http://www.fakr.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
7.1.1	**The absence of adequate scientific information is not used as a reason for postponing or failing to take conservation and management measures.** The management system for BSAI and GOA groundfish is designed to explicitly account for uncertaintes. Individual fish stocks are assigned to 1 of 6 tiers depending on the level of knowledge about their ecology and fishing history. Tier 1 stocks have the greatest amount of biological information and use the most complex harvest control rules for determining OLF and ABC. As the level of knowledge declines, the harvest control rules become progressively simpler and the reference points become more conservative. Tier 1 decision rules require a reliable understanding of the relationship between spawning stock size and subsequent recruitment, accompanied by a sophisticated statistical understanding of how this relationship varies. Reference points are based on the MSY concept. In tier 2, the same reference points are used but there is not such a stringent statistical requirement. In tier 3, there is limited knowledge of the stock recruitment relationship and proxies are used for the MSY reference points. The suitability of these proxies has been the subject of considerable research (Clark 1991, Restrepo 1999). OLF and ABC decision rules are progressively more conservative for tier 4, 5, and 6 stocks. Clark, W.G. 1991. Groundfish exploitation rates based on life history parameters. Can. J. Fish. Aquat. Sci 48: 734-750. Restrepo, V. (ed.) 1999. Proceedings of the fifth national NMFS Stock Assessment Workshop: Providing scientific advice to implement the precautionary approach under the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Tech. Memo. NMFS-F/SPO-40.	

	There are several steps between assessing the status of stocks relative to national standards and what the annual catch would be at that standard (OFL), and the establishment of the annual TAC. The following relationship is in place TAC <= ABC < OFL The rules for determining the OFL and ABC are such that the OFL is always greater than the ABC. This is explicitly designed to account for uncertainties (see above). While there are prescribed rules for determining the ABC, there are provisions in the management plans for assessment authors, Plan teams, and SSCs to recommend more conservative ABC if there are uncertainties in the data, recruitment variability, or a declining trend in population size. In other words, in the face of uncertainty it is explicitly stated that the correct course of action is to become more conservative. And, finally, the NPFMC is permitted to recommend more conservative ABC when warranted. The Council's ABC can only be equal to or lower than the SSC's. Then, additional ecosystem and socioeconomic considerations are taken into account before the TAC is established. However, the YAC can only be equal to or less than the ABC. When new uncertainties arise, research recommendations are made and there is accountability in subsequent years to follow up on related action items. However, these uncertainties do not lead to a postponement for providing advice. (BSAI and GOA groundfish management plans) (BS and GOA Pollock SAFE documents)	

Clause:

7.2 For new and exploratory fisheries, procedures shall be in place for promptly applying precautionary management measures, including catch or effort limits.

7.2.1 Provisions shall be made for the gradual development of new or exploratory fisheries while information is being collected on the impact of these fisheries, allowing an assessment of the impact of such fisheries on the long-term sustainability of the stocks.

7.2.2 Information collection and precautionary management provisions shall be established and initiated early on to allow impact assessment.

FAO CCRF 7.5.4

7.2.3 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. Measures may be temporary and shall be based on best scientific evidence available.

FAO CCRF 7.5.5

Evidence adequacy rating:

☑High ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
7.2	**The Alaska pollock fishery is a well established fishery (not exploratory).** Stocks assigned to tier 6 would normally be considered to be new or exploratory. In this case the OFL would be set to the average catch for of a given period and the maximum ABC would be set to 75% of this value. None of the pollock fisheries in Alaska would be considered new or exploratory.	

Evidence adequacy rating:

☑High ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
7.2.1	**The Alaska pollock fishery is a well established fishery (not exploratory).** **See 7.2**	

Evidence adequacy rating:		
☑High ☐ Medium ☐ Low		
Clause:	**Evidence**	
7.2.2	**The Alaska pollock fishery is a well established fishery (not exploratory).** **See 7.2**	

Evidence adequacy rating:		
☑High ☐ Medium ☐ Low		
Clause:	**Evidence**	
7.2.3	**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 fishery resource (Harvest Control Rules). Measures are based on best scientific evidence available.** The NMFS and ADFG undertake ecosystem level research regarding the effects of climate change on the pollock and related fisheries in the BSAI and GOA area. For example, the impacts of climate change on fish and fisheries is expected to increase the demand for more accurate stock projections and harvest strategies that are robust to shifting production regimes. The following examples are recent collaborative studies involving scientists from NMFS and universities in Alaska dnd Washington. Mueter et al. (2011) linked recruitment of eastern Bering Sea walleye pollock to variability in late summer sea surface temperatures and to the biomass of major predators. Warm spring conditions enhance the survival of early larvae, but high temperatures in late summer and autumn are associated with poor feeding conditions for young-of-year pollock and reduced recruitment in the following year. An ensemble of late summer temperature forecasts through 2050 were used to simulate future recruitment within an age-structured stock projection model that accounts for density-dependent effects (stock–recruitment relationship), the estimated effects of temperature and predation, and associated uncertainties. On average, recruitment in 2040–2050 should expectedly decline by 32–58% depending on assumptions about the temperature relationship, the magnitude of density-dependence, and future changes in predator biomass. Their approach can be used to evaluate the performance of different management strategies and provide long-term strategic advice to managers confronted with a rapidly changing climate.	

	Mueter, F.J., A.B. Bond, J.N. Ianelli, and A.B. Hollowed. 2011. Expected declines in recruitment of walleyed pollock (*Theragra chalcorgramma*) in the eastern Bering Sea under future climate change. ICES J. Mar. Sci. 68: 1284-1296. Ianelli et al. (2011) evaluated the performance of fishery management control rules for EBS pollock stock under climate change. They compared a number of management strategies under two types of recruitment pattern simulations: one that follows temperature- induced trends and the other that follows a stationary recruitment pattern similar to historical observations. The results indicated that status quo management with static reference points will result in much lower average catches and an increased likelihood of fishery closures, should reduced recruitment because of warming conditions hold. Alternative reference point calculations may offer significant gains under the changing environmental conditions. Ianelli, J.N. et al. 2011. Evaluating management strategies for eastern Bering Sea walleye pollock (*Theragra chalcogramme*) in a changing environment. ICES J. Mar. Sci. 68 1297-1304. In addition to these examples, the conservative management by the NPFMC of the groundfish stocks in Alaska, as directed by the MSA, has inbuilt mechanisms to deal appropriately and effectively with the dynamic nature of groundfish stocks abundance. Assessment authors and Plan Teams, who are scientific experts on the individual stocks, have the ability to recommend departures from the prescriptive ABC decision rules when ecological conditions warrant. In doing so, they must provide adequate scientific justification for their recommendations. (BS and GOA Pollock SAFE documents)	

D. Management Measures

8. Management shall adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery and based upon verifiable evidence and advice from available scientific and objective, traditional sources. ***FAO CCRF 7.1.1/7.1.2/7.1.6/7.4.1/7.6.1/7.6.9/12.3*** ***FAO Eco 29.2/29.4/30***						
Confidence Ratings	**Low**	**0 out of 10**	**Medium**	**0 out of 10**	**High**	**10 out of 10**

Clause: **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 sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact shall be considered.** ***FAO CCRF 7.1.1 Others 7.4.1/7.6.7*** ***Eco 29.2/29.4*** **8.1.1 States shall prohibit dynamiting, poisoning and other comparable destructive fishing practices.** ***FAO CCRF 8.4.2***	
Evidence adequacy rating: **☑High ☐ Medium ☐ Low**	
Clause:	**Evidence**
8.1	**Conservation and management measures (MSA, GOA and BSAI FMPs) are designed to ensure the long-term sustainability of fishery resources at levels which promote the objective of optimum utilization, and are based on verifiable and objective scientific and/or traditional sources. In the evaluation of alternative conservation and management measures, their cost-effectiveness and social impact is considered (NEPA Process).** The MSA is the managing federal legislation that defines how fisheries off the United States EEZ are to be managed. While the nine management and policy objectives which the NPFMC uses to construct amendments to their GOA and BSAI FMPs flow from the

MSA mandates.

From this legislation and Council objectives the management system for the NPFMC groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY (including the BSAI's 2 MMt cap), ABC, TAC, OFL—effort controls (ITQs, licenses, cooperatives), time and/or area closures (also known as habitat protection, marine reserves), by-catch controls (PSC limits, gear modifications, retention and utilization requirements), monitoring and enforcement (observer program), social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL) and to avoid seabirds). The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information (More details are provided in section C. The Precautionary approach).
http://icesjms.oxfordjournals.org/content/67/9/1861.full.pdf?keytype=ref&ijkey=Rr1hA2GwWtqE2TZ

The AFSC's REFM Division conducts research and data collection to support an ecosystem approach to management of Northeast Pacific and eastern Bering Sea fish and crab resources. More than twenty-five groundfish and crab stock assessments are developed annually, reviewed and commented upon by the Council's SSC and then used by the NPFMC to set catch quotas. In addition, economic and ecosystem assessments are provided to the Council on an annual basis. Division scientists evaluate how fish stocks, ecosystem relationships and user groups might be affected by fishery management actions and climate. http://www.afsc.noaa.gov/REFM/

Survey assessments from Russian Federation waters are also included with the overall federal stock synthesis to help pollock assessment authors better understand the Bering Sea.

http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf

The evaluation of alternative conservation and management measures and their cost-effectiveness and social impacts are considered under the Council's NEPA assessment (See Clause 13.1.1).

ADFG similarly conducts research and data collection on the stocks it manages within state waters. They bring their assessments to the Council's groundfish plan teams (GPT), so, as team members, they incorporate state with federal data so that the stock can be managed across its range. This approach also allows ADFG to meet their mandate to manage resources sustainably and supply the BOF with the best science available for them to make socially fair allocative and management decisions. www.adfg.alaska.gov/index.cfm?adfg=fishingcommercial.main

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence
8.1.1	**Alaska prohibits dynamiting, poisoning and other comparable destructive fishing practices.** As noted above, the MSA is the primary domestic legislation governing management of the nation's marine fisheries. In 1996, the United States Congress reauthorized the MSA to include, among other things, a new emphasis on the precautionary approach in U.S. fishery management policy. The MSA contains ten national standards, with which all fishery management plans (FMPs) must conform and which guide fishery management. National Standard 1 mandates that Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry. The mandate for sustainability and achieving OY precludes destructive fishing practices. Federal regulations only provide one method of directed fishing for pollock, the pelagic trawl. There are no destructive fishing gear or methods that are allowed under federal regulations off Alaska. Other methods of legally retaining pollock bycatch, are also regular fishing gear that are not considered destructive. http://www.nmfs.noaa.gov/sfa/magact/ http://www.fakr.noaa.gov/regs/summary.htm The main State managed pollock fishery remaining after AFA implementation is the PWS pollock fishery. The only allowed gear for direct targeting of pollock is a pelagic trawl. Most of the remaining State water areas are fished under State of Alaska commercial fisheries regulations. 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 SSL restrictions, respectively, incorporating federal/Council regulations within state waters. In most cases, pollock can be retained as bycatch in these commercial fisheries. State commercial fishing regulations stipulate, or specifically provide for, what is legal gear for groundfish. There are no destructive gears or methods that are provided for in regulation; so destructive fishing methods or gear is not allowed. http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial

<table>
<tr><td colspan="3">Clause:

8.2 States shall seek to identify domestic parties having a legitimate interest in the use and management of the fishery.

8.2.1 Arrangements shall be made to consult these parties and gain their collaboration.

FAO CCRF 7.1.2 Others 7.1.6</td></tr>
<tr><td colspan="3">Evidence adequacy rating:

☑High ☐ Medium ☐ Low</td></tr>
<tr><td>Clause:</td><td>Evidence</td><td></td></tr>
<tr><td>8.2</td><td>Domestic parties having a legitimate interest in the use and management of the fishery are identified.

The MSA’s National Standard 8 mandates that conservation and management measures shall, consistent with the conservation requirements of this 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. Accordingly, the NMFS and ADFG hold public meetings throughout the year in a variety of convenient locations. Participation is actively pursued.

For the pollock fishery, the Council has had to balance the needs of the large, offshore catcher processors and catcher boats that deliver to motherships, both of which catch and process at sea, and the shorebased catcher vessels that deliver shoreside. This allocation was extremely important to all of the pollock harvesters and processors; and became even more so as the fleets and processors exceeded capacity. With excess capacity, the mobile offshore catchers and processors could impact the shorebased pollock fleet and often leave them with fishing areas close to town that were locally depleted; particularly when roe stripping (the practice of stripping roe from female pollock and discarding all female carcasses and all male and juvenile pollock).

For example, in 1989 there were: 70 CV; 45 CP & 5 motherships that fished pollock, and pollock was 71% of GF catch; a harvest of 1.09 MMT worth $190 million at the ex-vessel level and worth $600 M at 1st wholesale. Those vessels (mostly CPs) that stripped roe took a larger % of the harvest, leaving the usual harvest of fillets and surimi products lost from US markets by the roe stripping practice. Wasteful, highly allocative (favoring CP & motherships over shore based plants & vessels) fisheries allocations led to the wasteful fishing practice of roe stripping by the offshore fleet, producing ecosystem concerns created by the large volume of carcasses discards at sea. Because the pollock fleets were continuing to grow, harvests were occurring faster and faster each year in a race for fish; resulting in compressed seasons and a high potential to exceed TAC, thereby increasing the likelihood of reduced spawning potential. Roe recovery rates were 4% BSAI and 7.5% in the GOA. So that in 1989 at-</td><td></td></tr>
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sea pollock discards of females alone were 28,500 mt (96% of 29,700 mt) in the BSAI and 19,200 mt (92.5% of 20,750 mt) in the GOA.

http://www.nmfs.noaa.gov/sfa/FMP/Archive%20Files%20%28FMP%29/North%20Pacific%20Fishery%20Management%20Council/SecRevpropAm%2019%2014%20FMP%20Groundfish%20GOA%20and%20BSAI.pdf
http://www.gpo.gov/fdsys/pkg/FR-1994-03-25/html/94-7139.htm

Because of the waste and ecological concerns the Council prohibited roe stripping. It further established a Council policy of full utilization such that the pollock harvest is to be used for human consumption to the maximum extent possible. It also divided the pollock TAC into two seasonal allowances: roe-bearing ("A" season) and non roe-bearing ("B" season). In the GOA the TAC was separated into four equal quarterly allowances. The percentage of the TAC allocated to each allowance is determined annually during the TAC specifications process. Over the next few years the Council allocated the TAC into an inshore and offshore allocation, and later Congress, reduced capacity, set the final inshore/offshore allocation and provided fleets and processors the tools (Cooperatives and named vessels and plant participants) to economically address the pollock allocation and the industry's impacts from the Steller sea lion regulations.

The proposed socio-economic changes were significant. All of these regulatory and legislative actions had potential multimillion dollar impacts on the harvesting, processing and support industries, the communities that supported them and even this country's balance of trade. Impacts were particularly focused on the community participants in coastal Alaska (Dutch Harbor, Kodiak, Sand Point, King Cove and Akutan) and various communities in Washington and Oregon, in particular Seattle. The various iterations of regulations prohibiting roe stripping, Inshore/Offshore I, II and III, and the Council implementation of the federal AFA legislation consumed hundreds of hours of analytical evaluation, state/federal/national meetings and court challenges. The multiple Council analysis were NEPA compliant, meaning that they evaluated the full array of impacts, seeking out affected parties and providing 10's of hours at most Council meetings to take written and oral testimony from individuals and organizations representing the various stakeholders.
See Council Public Meetings & Archives 1989-2002:
http://www.fakr.noaa.gov/npfmc
http://www.solano.com/pdf/N20_TOC.pdf (The NEPA Book)

Additionally, the Council sought to not only identify domestic parties having a legitimate interest in the use and management of the fishery, it also made certain that potentially unaffected native Alaskans would receive some benefit associated with the rationalization/privatization of the pollock fishery. Ten percent of the BSAI pollock allocations are reserved for use by the CDQ program participants, which includes 65 eligible communities organized into six CDQ groups and was designed to ensure fishing access, support economic development, alleviate poverty, and provide economic and social benefits to residents of economically distressed western Alaskan communities.
http://www.edf.org/documents/11391_alaska-ifq.pdf

The fishery dependence of coastal and western Alaska communities was addressed through the creation of the pollock, sablefish, and halibut CDQ programs for the BSAI

	in the early to mid-1990s and the expansion of those programs into the multispecies CDQ Program with the addition of all other groundfish species by 1999. The CDQ Program has provided the following for the CDQ communities: 1) additional employment in the harvesting and processing sectors of the groundfish fisheries; 2) training; and 3) income generated by fishing the CDQ allocations. In many cases, CDQ royalties have been used to increase the ability of the residents of the CDQ communities to participate in the regional commercial fisheries, or residents themselves have fished the CDQ. The purpose of the CDQ Program was to provide western Alaska fishing 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 was intended to help economically distressed western Alaska communities to diversify their local economies and to provide new opportunities for stable, long-term employment. The original Council guidance for implementing the CDQ Program focused on using the allocations to develop a self- sustaining fisheries economy. http://www.fakr.noaa.gov/regs/679c30.pdf Additionally, to better understand the affected parties having legitimate interest in the target fisheries, the Economic and Social Sciences Research Program within NMFS's REFM provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Much of the existing economic data about Alaskan fisheries is collected and organized around different units of analysis, such as counties (boroughs), fishing firms, vessels, sectors, and gear groups. It is often difficult to aggregate or disaggregate these data for analysis at the individual community or regional level. In addition, at present, some relevant community level economic data simply are not collected at all. As a result, the NPFMC, the AFSC, and community stakeholder organizations have identified ongoing collection of community-level socio-economic information that is specifically related to commercial fisheries as a priority and the affected stakeholders and their communities. To address this need, the AFSC's Economic and Social Sciences Research (ESSR) Program has been preparing the implementation of the Alaska Community Survey, an annual voluntary data collection program initially focused on Alaska communities for feasibility reasons, in order to improve the socio-economic data available for consideration in North Pacific fisheries management. http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
8.2.1	**Arrangements are made to consult these parties and gain their collaboration (BOF and NPFMC public processes).** See Clause 8.2. The state and federal regulatory agencies and organizations provide numerous means to seek out and consult with legitimate stakeholders to insure their	

	collaboration. The BOF and the NPFMC are openly public processes. Makeup of the Council and BOF, the Council's Advisory Panel and the BOF's advisory committees located in most communities of the state, is made up of a broad cross representation of stakeholders who provide collaboration to these processes. Additionally, any individual or group can submit proposals for discussion of management and research regarding the pollock fisheries and their impact on bycatch and the ecosystem. The BOF holds regular meetings in communities throughout coastal Alaska, while the NPFMC meets in communities in Alaska as well as in Washington and Oregon to provide public opportunities. Written comments are accepted when it is not possible to attend in person. http://www.fakr.noaa.gov/npfmc/ http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.main The Council, as outlined in policy, also continues to incorporate local and traditional knowledge in fishery management, considers ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate. They also actively work to increase Alaska Native participation and consultation in fishery management through community workshops. Further, the Council has developed a rural-community outreach committee whose three primary tasks are: 1) to advise the Council on how to provide opportunities for better understanding and participation from Alaska Native and rural communities; 2) to provide feedback on community impacts sections of specific analyses, if requested; and 3) to provide recommendations regarding which proposed Council actions need a specific outreach plan and prioritize multiple actions when necessary. This has been particularly important in respect to CDQ allocation and salmon bycatch in the pollock fisheries. http://www.fakr.noaa.gov/npfmc/rural-outreach/rural-community-outreach-committee.html http://www.alaskafisheries.noaa.gov/npfmc/fmp/goa/GOA.pdf Lastly, the NPFMC advises the public through its newsletters and web pages so that the public will be knowledgeable about the proposed Council actions when they consult and collaborate. NMFS, ADFG and the BOF also provide such information access and outreach.	

Clause:

8.3 Fleet capacity operating in the fishery shall be measured and 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 8.1.2, 8.1.3

8.3.1 Mechanisms shall be established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource. Such mechanisms shall include monitoring the capacity of fishing fleets.

FAO CCRF 7.1.8, 7.6.3

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence	
8.3	**Fleet capacity operating in the fishery is measured. Alaska maintains, 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 (RAM, CFEC).** The Alaska Region NMFS/RAM division requires that all vessels fishing or processing groundfish possess a federal fishing permit or a federal processing permit. The permit describes all pertinent information about the vessel and its' vessel fishing category, gear type and target fisheries. As a condition of these permits vessels must submit also comply with all regulations described in the GOA and BSAI FMPs. This includes reporting and landings requirements (elandings and logbooks), carrying onboard observers or having shoreside observers at shore plants. This information is regularly up-dated and meets or exceeds the international standards and practices required to succinctly characterize the groundfish fisheries off Alaska. In like manner, the State of Alaska, gathers similar information from all vessels fishing in state waters. However, Article VIII, Section 15 allows the State to limit entry into any fishery for purposes of resource conservation and to prevent economic distress among fishermen and those dependent upon them for a livelihood. Therefore, fishermen participating in state waters must hold approved entry permits (commercial fishing licenses/gear cards), and fish from licensed vessels. Licenses must be renewed annually with the Commercial Fisheries Entry Commission (CFEC) and comply with all state landing and reporting requirements. This information is collected at the individual vessel level at both the state and federal level. NMFS/RAM and CFEC share information about individual vessels and their permits. http://www.fakr.noaa.gov/ram/ffpfpp.htm http://www.fakr.noaa.gov/ram/afa.htm http://www.cfec.state.ak.us/index.htm	

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence	
8.3.1	**Mechanisms are established where excess capacity exists to reduce capacity to levels commensurate with sustainable use of the resource (AFA). Such mechanisms include monitoring the capacity of fishing fleets.** The MSA, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. National Standard 1 mandates that conservation and management	

measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry. One federal tool in Alaska in practice, to accomplish this balance of fishing effort to fishing resource, is the use of effort controls, such as occurs with the pollock cooperative management.

Cooperative management of the pollock fishery represents a dramatic change from the open access fishery that preceded it. Following domestication of the groundfish fishery domestic operations expanded rapidly, leading to overcapitalization. By 1989 there were: 70 CV; 45 CP & 5 motherships that fished pollock, and pollock was 71% of GF catch. By 1998 when AFA was passed by Congress, the fleets had grown significantly. AFA bought and scrapped 9 CPs and many CVs did not qualify to fish pollock. In 2010 there were 110 CV permits, but only 93 CV vessels fished; there were 21 CP permits, but only 15 CPs fished; and 3 motherships had permits and fished. Capacity had significantly decreased.

http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf
http://www.fakr.noaa.gov/ram/afa.htm#list

A 2002 Council assessment to Congress of AFA noted that: the AFA has been largely successful in achieving its goals. Members of the BSAI pollock fishing community have stated that the AFA has allowed them to improve their fishing practices and operate their businesses in a more rational manner. Reduced bycatch, higher utilization rates, increased economic returns, and improved safety are among the direct benefits of AFA. They have also stated that the AFA has helped to mitigate the negative impacts of Steller sea lion (SSL) management measures as well as comply with the protection measures that were implemented. The flexibility provided by cooperatives, and by individual vessel allocations of pollock and other species has allowed the AFA fleet the ability to spread their effort in time and space to accommodate SSL conservation measures. They have also indicated that members of the pollock industry have never worked more closely together to make the fishery operate in an efficient manner. Finally the cooperative management structure has shifted more of the monitoring and enforcement burden to the cooperatives and their members, which has allowed the fishery to be managed more precisely. Sections noted above in Clause 8.3 describe the mechanisms to monitor the capacity of the fleet. Additionally, NMFS/RAM compiles comprehensive reports regarding the AFA pollock fleet on their web site, and the annual Economic SAFE often details the AFA Pollock Fishery.

Additionally, the pollock vessels are fishing under additional fleet capacity constraints described in both federal legislation (AFA) and the Council/NMFS implementing regulations.

This includes:

1. Removed excess capacity in the offshore pollock sector through the retirement and scrapping of 9 factory trawlers.
2. Established U.S. ownership requirements for the harvest sector vessels.

	3. Established specific allocations of the BSAI pollock quota as follows - 10 percent to the western Alaska CDQ program, with the remainder allocated 50 percent to the onshore sector, 40 percent to the offshore sector, and 10 percent to the mothership sector. 4. Identified the specific vessels and processors eligible to participate in the BSAI pollock fisheries 5. Established the authority and mechanisms by which the pollock fleet can form fishery cooperatives and how the vessels can fish another's quota through tight Cooperative oversight, monitored by NMFS. 6. Established specific measures to protect the non-AFA (non-pollock) fisheries from adverse impacts resulting from the AFA or pollock fishery cooperatives. All of these requirements have information detailing the complex set of vessel and ownership information that monitors the pollock fleet; much of it is detailed at the NMFS/RAM web site or within the Council's NEPA analysis. http://www.fakr.noaa.gov/sustainablefisheries/afa/congress202.pdf http://www.afsc.noaa.gov/REFM/docs/2010/economic.pdf http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf Alaska's Constitution will not permit the use of IFQs or cooperatives in state waters. However, Article VIII, Section 15 allows the State to limit entry into any fishery for purposes of resource conservation and to prevent economic distress among fishermen and those dependent upon them for a livelihood. Therefore, fishermen participating in state waters must hold approved entry permits (commercial fishing licenses/gear cards), and fish from licensed vessels. Licenses must be renewed annually with the Commercial Fisheries Entry Commission (CFEC) http://www.cfec.state.ak.us/ In 2011, 61 trawl catcher vessels participated in the Western (26) and Central (48) pollock fisheries catching 58,660 mt in the directed fishery. Some vessels fished in both areas. In the non-directed fishery 14,091 mt of pollock was reported. So about 11,879 mt remains for these areas. The quarterly release of 25% of the annual TAC ensures that only vessels which can economically participate do. The current cost of fuel and the vessels fixed costs, fairly well contain fleet over-capacity. In the only directed state water fishery, PWS, the GHL has been averaging at only 3 million pounds annually. This means that only 5 – 11 small 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.	

Clause:

8.4 States and relevant groups from the fishing industry shall encourage the development and implementation of technologies and operational methods that reduce waste and discards of the target species. These measures shall be applied appropriately.

***FAO CCRF* 8.4.5**

8.4.1 Technical measures shall be taken into account, where appropriate, in relation to:

- **fish size**
- **mesh size or gear**
- **discards**
- **closed seasons**
- **closed areas**
- **areas reserved for particular (e.g. artisanal) fisheries**
- **protection of juveniles or spawners**

8.4.2 Suitable arrangements shall be in place to measure performance and to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear, methods and techniques. Less consistent methods, practices and gears shall be phased out accordingly.

FAO CCRF 7.6.9, 7.6.4, 8.5.2

8.4.3 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 8.2.4

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
8.4	**Alaska and relevant groups from the fishing industry encourage the development and implementation of technologies and operational methods that reduce waste and discards of the target species (IRIU).** The Magnuson-Stevens Fishery Conservation and Management Act, as amended, sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all fishery management plans must be consistent. Two important standards apply to waste and discards. First is National Standard 1 which states that: Conservation and management measures shall prevent overfishing while achieving, on

	a continuing basis, the optimum yield from each fishery for the United States fishing industry. The Second is National Standard 9 which states that: 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. The standard to achieve OY requires the NPFMC to manage the pollock resource at a sustainable level; which means that waste and discards of target species must be minimized. Standard 9 advises the Council to minimize bycatch and bycatch mortality. The Council also adopted a set of nine management and policy objectives for the GOA and BSAI FMPs that are reviewed annually. Four important objectives on waste and discards are to: Prevent Overfishing, Promote Sustainable Fisheries and Communities, Preserve Food Webs, Manage Incidental Catch and Reduce Bycatch and Waste. With this direction, the Council, with the help of industry, has adopted over the years many technological and operational strategies to reduce target waste and discards. Initially the industry, working with Council, NMFS and Alaska Fisheries Development Foundation staff worked with cod end mesh size to eliminate the harvest of juvenile pollock. Results of this study showed that successful bycatch reduction of juveniles only occurred when catches were small (< 15 mt). Because pollock fishermen were also faced with prohibited species bycatch caps (PSC) on halibut and king and Tanner crab, they chose to switch to pelagic trawls that only fished a portion of the footrope on the bottom and had large (up to 35‘) leading edge meshes that allowed halibut and crab to escape. This net structure also allowed vessels to better target large adults near the bottom without having their fishery closed by reaching halibut or crab PSC caps. By targeting larger fish, small fish are avoided. The success of this gear at reducing bycatch resulted in a regulation that limited directed pollock fishing to pelagic gear. In Clause 8.2 above we noted that pollock roe stripping (the practice of stripping roe from female pollock and discarding all female carcasses and all male and juvenile pollock) was prohibited in 1990, and the council adopted a policy of utilization. This became a full FMP amendment (for BSAI and GOA) to increase retention and increase utilization (IRIU), which set product recovery rates for pollock. Industry adapted to these new requirements by setting economic incentives to the fleets to target optimal sized fish or lose a financial premium on their catch; by building meal plants (and some processors even built extractors that centrifuged oils of the waste to make fuel to run the plants); and coordinating successful fishing target areas amongst vessels fishing for specific processors to reduce fish of unwanted sizes. http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf The next significant change which allowed the pollock fishery to reduce bycatch and waste was the rights-based fishery approach. Here, the AFA provided for cooperatives	

	the operational mechanism to set individual vessel limits with financial incentives to achieve those goals. This type of rights based management has improved fishing practices and allowed operations to operate in a rational business horizon. http://www.fakr.noaa.gov/sustainablefisheries/afa/congress202.pdf The success of these programs that reduce waste and discards occurred because the Council process, utilizing the NEPA evaluation, encouraged active participation by industry to work with the Council to achieve obtainable goals, often with intermediate steps.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
8.4.1	**Technical measures are taken into account, where appropriate, in relation to fish size, mesh size or gear, discards, closed seasons, closed areas, areas reserved for particular (e.g. artisanal) fisheries, protection of juveniles or spawners.** Clause 8.4 above describes how targeting specific fish size was accomplished through the use of mesh size and gear type by technical, economic and operational methods. The technical methods focused on cod end mesh size and then a move to pelagic trawls that fished in areas of larger adults. Clause 8.4 also notes that discards were dealt with through the regulation of IR/IU that resulted in industry requirements to obtain specific product recovery rates. Achieving these product recovery rates lead to the placement of meal plants and other technical devices on vessels and in shore plants that extracted most of the previous waste and turned it into product. The Council adapted season closures for pollock in 1990 when they apportioned the harvest between an A-Season roe fishery and a B-Season non-roe fishery. It also separated the GOA TAC into four equal quarterly allowances. The percentage of the TAC allocated to each allowance is determined annually during the TAC specifications process. They had prohibited roe stripped because it took a larger % of the harvest, and fillets and surimi products were discounted from US markets by the roe stripping practice. The Council found it was wasteful, highly allocative (favoring CP & motherships over shore based plants & vessels), and caused ecosystem concerns with tons of discarded carcasses. Because the pollock fleets were continuing to grow, harvests were occurring faster and faster each year in a race for fish; resulting in compressed seasons and a high potential to exceed TAC and disproportionately reducing egg production of the spawning stock. Roe recovery rates were only 4% in the BSAI and 7.5% in the GOA. The season closure dates were thought to also benefit SSL by separating pollock harvest and reducing the chance of causing localized depletions	

of their prey.

Closed areas were also used in both the GOA and BSAI to protect crab; these nearshore areas also provided protection to younger pollock. When the Council prohibited bottom trawl for directed pollock fishing, the need for these closed areas were removed for the directed pollock harvesters. Other closed areas were brought into force near SSL rookeries and haulouts to provide SSL with a buffer between the large industrial pollock fishery and the main areas where female and young SSL spent most of their time foraging for prey.

http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm
http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf
http://www.fakr.noaa.gov/protectedresources/stellers/section7.htm

Though the pollock fishery is a large industrial fishery, some of the catcher vessels that fish from shorebased processing plants in the GOA and the BSAI are small (59' to 120') and need some protection from large CPs or mothership operations (ranging from 180' – 600'). In the BSAI a Catcher Vessel Operational Area (CVOA) was established to limit access to pollock within the area to catcher vessels delivering to the inshore component. This area is between 163° W. and 168° W. longitude, south of 56° N. latitude, and north of the Aleutian Islands. The CVOA is open to all pollock vessels during the A-Season, but the offshore component is not allowed to fish within the CVOA during the B-Season. In the GOA, the Inshore/Offshore allocations and the quarterly allocation of pollock TAC, with a coincidently open fishery in the BSAI, was enough to separate large and small vessels.

http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf

In Clause 8.2 and 8.4 above it was noted that the amendment which prohibited roe stripping and set a seasonal allowance between the roe and non-roe periods was a significant step to protect spawning pollock. Section 6 – The Precautionary Approach also describes the TAC setting process that sets harvest to maintain a sustainable spawning biomass, and closes the fishery if the spawning biomass falls to unsafe levels. The above Clauses also describe regulations that provide protection to juveniles; including targeting with pelagic trawls, the roe stripping amendment, IR/IU and AFA cooperatives.

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**
8.4.2	**Arrangements are in place to measure performance and to promote, to the extent practicable, the development and use of selective, environmentally safe and cost-effective gear, methods and techniques. In that respect, inconsistent methods, practices and gears are phased out accordingly (pelagic trawl gear only).** The NMFS/AFSC staff maintains gear researchers who have worked with the industry to evaluate the gear for efficiency and its impact on the bottom habitat and on bycatch species. The following titles represent a sample of the studies that resulted in gear modifications: (1) Differences in orientation and swimming of walleye pollock, Theragra *chalcogramma*, in a trawl net under light and dark conditions: Concordance between field and laboratory observations. 2000. (2) Injury rates of red king crab, *Paralithodes camtschaticus*, passing under bottom-trawl footropes. 1999. And (3) Observation of fish behavior in trawls: Finding ways to reduce bycatch. 1994. http://access.afsc.noaa.gov/pubs/search_results_advanced.cfm?PageNum_rsSearch=3&theTitle=&theAuthor=Rose&theCrabskeywords=&theFishkeywords=&theMarinemammalskeywords=&theDocumentyear=all&theDivision=all&theDocumenttype=all Industry also takes their nets to flume tanks to test the performance of their nets under test tank operations. When industry was able to demonstrate the effectiveness of the pelagic trawl for reducing halibut and crab bycatch, they petitioned the Council to restrict pollock harvest only to pelagic trawls, which the Council adopted. http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm Other joint gear modification studies include tests of salmon excluder tunnels in pelagic trawls to reduce salmon as bycatch. For several years, the Bering Sea pollock industry has been working on developing a Chinook salmon excluder device for trawl gear, which allows salmon to escape from the trawl net underwater, while retaining pollock. The success of such devices relies on the different swimming behaviors of pollock and Chinook salmon. Through experimental fishery permits authorized by the Council and NOAA Fisheries, various iterations have been tested, and their voluntary use by pollock skippers is increasing. Recently, the GOA pollock industry has begun to consider how the Bering Sea Chinook salmon excluder might be adapted for the smaller GOA pollock fleet (http://www.fakr.noaa.gov/npfmc/bycatch-controls/SalmonBycatch.html).

Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
8.4.3	**Vessel identification marking of trawl gear is not required.** Vessel identification marking of trawl gear is not required. The trawl is always attached to the vessel and not left on its own as in cases where fixed gear pots or longlines are used**.**	

9.	**There shall be defined management measures designed to maintain stocks at levels capable of producing maximum sustainable levels.** ***FAO CCRF 7.1.8/7.6.3/7.6.6/8.4.5/8.4.6/8.5.1/8.5.3/8.5.4/8.11.1/12.10*** ***FAO Eco 29.2bis***

Confidence Ratings	**Low**	**0 out of 11**	**Medium**	**0 out of 11**	**High**	**11 out of 11**

Clause:

9.1 Measures shall be introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks. Also, efforts shall be made to ensure that resources and habitats critical to the wellbeing of such resources which have been adversely affected by fishing or other human activities are restored.

FAO CCRF 7.6.10

Eco 30

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
9.1	**Measures are introduced to identify and protect depleted resources and those resources threatened with depletion, and to facilitate the sustained recovery of such stocks (MSA). Also, efforts are made to ensure that resources and habitats critical to the wellbeing of such resources (EFH) which have been adversely affected by fishing or other human activities are restored.** The pollock fishery in Alaska is not overfished, nor does overfishing occur on this resource. Careful stock surveys and accompanying stock analysis done annually by staff from the NMFS and ADFG ensure populations remain at sustainable levels. See evidence from Section B – Science and Stock Assessment Activities, Clauses 4 & 5. Council and BOF guidelines, state and federal regulations and MSA with its National Standards all define to management agencies what must be done if a stock becomes depressed. The US Congress established new statutory requirements under the MSA in 2006 to end and prevent overfishing by the use of annual catch limits (ACLs) and accountability measures. These new requirements were implemented in 2010 for all stocks subject to overfishing and in 2011 for all stocks not subject to overfishing. A new provision of the MSA requires that the respective scientific and statistical committees (SSC) of the eight fishery management councils determine scientific benchmarks, while the councils continue to recommend quotas subject to these

	scientific benchmarks. This separation of authorities represents 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 also establish catch thresholds 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 the take of any endangered or threatened mammals or seabirds and provide a database for evaluating likely consequences of future management actions. The Council has consistently adopted the annual OFL 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. The NPFMC first defined OFL in 1991 as a catch limit that never should be exceeded. The NPFMC adopted more conservative definitions of OFL in 1996 and again in 1999, to comply with revised national guidelines. 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 (described below). 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 BMSY, or a proxy for BMSY, the fishing mortality is reduced relative to the stock status. 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 FMSY), after Congress redefined the terms “overfishing” and “overfished” to mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce MSY on a continuing basis. The OFL could be set lower than catch at FMSY at the discretion of the SSC. OFL can be then virtually defined as a limit reference point. Because Tiers 2–4 could be interpreted as treating MSY as a target rather than as a limit, the NPFMC revised those tiers by changing the default value for the rate of fishing mortality from F30% (the rate that reduces equilibrium biomass to 30% of its unfished level under an assumption of constant recruitment) to the more conservative estimate of F35%. The buffer between OFL and ABC accounts for uncertainty in single-species stock assessments, ecosystem considerations, and operational constraints in managing the fishery. The SSC sets these management	

benchmarks based on scientific standards. Finally, the Council determines the TAC based on social and economic considerations. In application, the NPFMC sets TAC ≤ ABC < OFL. Under the new requirements, ACL = ABC. Actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC (Figure below), because of the complex array of accountability measures governing these fisheries.

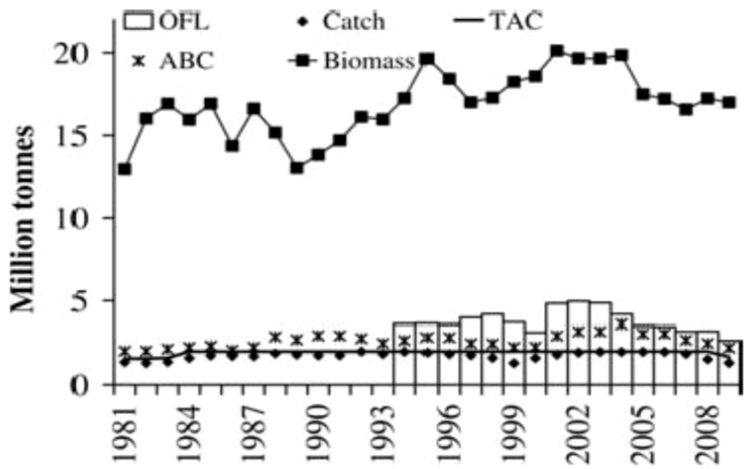

Figure 2. Cumulative estimates of biomass, overfishing level (OFL), acceptable biological catch (ABC), total allowable catch (TAC), and actual catch (all in million tonnes) across all groundfish species in the Northeast Pacific, 1981–2009.

(Dicosimo et al. 2010)

The biological reference points have evolved over the past 20 years. In 1996, the Council redefined OFL and ABC, partly to facilitate more conservative, risk-averse management measures when stock size and mortality rates are not fully known (with the consequence that annual TACs were reduced for many stocks or stock complexes). Their determination is prescribed through a set of six tiers based on the availability of various types of information. “Data-rich” and “datapoor” are relative terms not actually used in the FMP, because the variability in the availability and quality of the data is substantial. Here, data-rich stocks are considered those for which data are sufficient to apply age-structured modelling (Methot, 2009) and have some estimate of unfished biomass (i.e. Tiers 1–4; Tier-2 and Tier-4 stocks are not present in the BSAI management area). Data-poor stocks are those where the unfished biomass cannot be estimated and catch limits are set using survey biomass estimates or historical catch data (i.e. Tiers 5– 6). For many groundfish stocks, F40% is used as a reference point in the ABC control rule. For Tier 3 stocks, where B> B40%, F40% is the upper limit on FABC and F35% is the FOFL. For stocks for which sufficient data exist to assess current biomass (B) relative to BMSY or B40% (the long-term average biomass that would be expected under average recruitment and F = F40%), the control rules reduce the allowable F when B falls below BMSY (Tiers 1 and 2) or B40% (Tier 3). This serves to accelerate the rate of rebuilding should a stock fall to a low level of abundance (Dicosimo et al. 2010).

	The GOA TAC is managed under Tier 3, and since 1992, the Gulf of Alaska pollock TAC has been apportioned spatially and temporally to reduce impacts on Steller sea lions. Although the details of the apportionment scheme have evolved over time, the general objective is to allocate the TAC to management areas based on the distribution of surveyed biomass, and to establish three or four seasons between mid-January and autumn during which some fraction of the TAC can be taken. The Steller Sea Lion Protection Measures implemented in 2001 establish four seasons 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. Allocations to management areas 610, 620 and 630 are based on the seasonal biomass distribution as estimated by groundfish surveys. In addition, a new harvest control rule was implemented that requires a cessation of fishing when spawning biomass declines below 20% of unfished stock biomass. The Council is not just interested in single species management, but seeks to maintain a healthy ecosystem to insure long term sustainability. Therefore both target and non-target species are regularly assessed and bycatch limits and PSC caps are in place to control impacts. Ocean habitat is essential for maintaining productivity of fishery resources, and is a key component of an ecosystem-oriented management approach. Therefore Essential Fish Habitat (EFH), as defined in MSA, is 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 SSL protection areas around rookeries and haulouts (10 & 20 nm closures). http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm http://www.nmfs.noaa.gov/sfa/magact	

Clause:

9.2 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.

FAO CCRF 7.6.6

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	**Evidence**	
9.2	**When deciding on use, conservation and management of the resource, due recognition is given, where relevant, in accordance with national laws and regulations (MSA), to the traditional practices, needs and interests of indigenous people and local fishing communities (through Council and BOF) which are highly dependent on these resources for their livelihood.** National Standard 8 of the MSA states that Conservation and management measures shall, consistent with the conservation requirements of this 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. http://www.nmfs.noaa.gov/sfa/magact/mag3.html#s301 Clause 8.2 & 8.4.1 above describe how the Council addressed the needs of Coastal communities where pollock was harvested shoreside when searching for an allocation balance between the large and highly mobile offshore fleet and the smaller vessels associated with the shoreside processors. These issues occurred during roe stripping, Inshore/Offshore allocations, developing a CVOA harvest area, and sideboard protections under the AFA program. http://www.fakr.noaa.gov/sustainablefisheries/afa/congress202.pdf Native Alaskans likely targeted pollock in historic times, but not in the industrial quantities that are taken today. Because of the industrial size and the economic cost of entrance, economically disadvantaged Western Alaskan native communities were not able to participate in the industrial fisheries development of the modern pollock fishery. The NPFMC initially allocated 7.5% of pollock to Western Alaskan villages. This CDQ allocation of pollock was to consider the interests of subsistence, small-scale, and artisanal fisheries, under Amendment 18 to the BS/AI FMP. Because the CDQ groups did not initially possess large industrial trawl vessels they fished their quota as a royalty. As their quota was increased, they joined in partnership with the offshore catcher processor fleet. Later, CDQ groups purchased ownership shares of CPs, CVs and processing plants.	

	The purpose of the CDQ Program was to provide western Alaska fishing 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 was intended to help western Alaska communities to diversify their local economies and to provide new opportunities for stable, long-term employment. The original Council guidance for implementing the CDQ Program focused on using the allocations to develop a self- sustaining fisheries economy (http://www.fakr.noaa.gov/regs/679c30.pdf).	

Clause:

9.3 States and relevant groups from the fishing industry shall encourage the development and implementation of technologies and operational methods that reduce discards of the target and non-target species catch. 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.

FAO CCRF 8.4.5

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
9.3	**Alaska and relevant groups from the fishing industry encourage the development and implementation of technologies and operational methods that reduce discards of the target and non-target species catch (PSC caps). The use of fishing gear and practices that lead to the discarding of catch is discouraged and the use of fishing gear and practices that increase survival rates of escaping fish is promoted (salmon excluders).** As noted above in Clause 8.4 the MSA and two of its National Standards, No. 1 and 9, and four of the nine Council management and policy objectives require the Councils, in their development of FMPs that encourage "good behavior" that results in practices that reduce discards of target and non-target species catch. In many cases the Council's actions are posed as either incentives or disincentives with either economic costs or benefits. This allows the industry the flexibility to find the means most optimal to their fishing practices and operations. For example, when faced with high salmon bycatch rates in the pollock fishery, the preferred alternative of managers was to close areas of high bycatch when PSC caps for salmon were reached. After trying this approach, industry found that salmon might be in a closed area one day but move to another area to cause a bycatch problem and require a new closed area; while the first closed area no longer had high salmon abundances. This had high economic cost to industry. Armed with this information industry came back to the Council with a proposed rolling hot closure that used daily fleet coordination of vessel by vessel salmon bycatch rates to help move vessels from one area to another; temporarily closing hot spots by industry coordination rather by regulation. Vessels who agreed to fish under this regime could fish under less	

stringent rules. This improved pollock catches and reduced salmon bycatch; thus allowing the most economical harvest of pollock and a control on salmon bycatch. While the Council has been required to the disincentives, the program is largely working. In the GOA salmon bycatch controls are still at the cap and closure stage, but the Council is committed to developing a more responsive program.
http://www.fakr.noaa.gov/npfmc/bycatch-controls/BSChinookBycatch.html
http://www.fakr.noaa.gov/npfmc/bycatch-controls/BSChumBycatch.html
http://www.fakr.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html

Clauses 8.4, 8.4.1, 8.4.2 above describe various technical and operational techniques the Council has incorporated into their FMPs to reduce discards of both target and non-target bycatch. As the reader may recall from these Clauses, modifications that eliminated roe stripping, adjusted bottom trawl cod end mesh, switched to pelagic trawl nets, implemented IR/IU, split the TAC between A & B Seasons and closed seasons and areas were all technical and operational modifications to protect non-target species, juvenile or spawning pollock or provide non-fishing areas for ecosystem consideration (such as buffers around SSL rookeries and haulouts).

Other approaches of gear modification to reduce bycatch are usually tested through the Council's Test Fisheries process, where industry and NMFS test technical solutions to bycatch problems; such as using salmon excluder tunnels in pelagic trawls to reduce salmon as bycatch. For several years, the Bering Sea pollock industry has been working on developing a Chinook salmon excluder device for trawl gear, which allows salmon to escape from the trawl nets underwater, while retaining pollock. The success of such devices relies on the differential swimming behaviors of pollock and Chinook salmon. Through experimental fishery permits authorized by the Council and NOAA Fisheries, various iterations have been tested, and their voluntary use by pollock skippers is increasing. Recently, the GOA pollock industry has begun to consider how the Bering Sea Chinook salmon excluder might be adapted for the smaller GOA pollock fleet. Since salmon bycatch caps can shut down directed pollock harvest, as the product improves, the financial and peer pressure incentive to use one becomes obvious.

http://www.fakr.noaa.gov/npfmc/bycatch-controls/SalmonBycatch.html

Most importantly, the implementation of the AFA cooperative fisheries reduced the "Olympic race for fish" mentality and encouraged vessels within cooperatives to work together to reduce discards and better implement IR/IU savings in the pollock fishery. Such improvements benefited the returns to the cooperative and its members, an excellent financial incentive.
http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm

http://www.fakr.noaa.gov/sustainablefisheries/afa/congress202.pdf

Clause:
9.4 Technologies, materials and operational methods shall be applied to minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear.
FAO CCRF 8.4.6, 8.4.1
Evidence adequacy rating:
☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
9.4	**Technologies, materials and operational methods are applied to minimize the loss of fishing gear and the ghost fishing effects of lost or abandoned fishing gear.** With the implementation of pollock cooperatives in the fishery, the Olympic race for fish mentality subsided leading to a reduction in the amount of vessels fishing and gear deployed; which reduced lost gear during fishing operations. At present, if any trawl gear unit is lost, it will be recovered immediately, given its high cost. http://www.fakr.noaa.gov/sustainablefisheries/afa/congress202.pdf http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm	

Clause:
9.5 There shall be a requirement that fishing gear, methods and practices where practicable, are sufficiently selective as to minimize waste, discards, and catch of non-target species - both fish and non-fish species and impacts on associated or dependent species.
FAO CCRF 7.6.9, 7.2.2
Evidence adequacy rating:
☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
9.5	**There is requirement that fishing gear, methods and practices where practicable, are sufficiently selective as to minimize waste, discards, and catch of non-target species - both fish and non-fish species and impacts on associated or dependent species (PSC).** As has been detailed above in Clauses 8.4, 8.4.1, 8.4.3, 9.3 and 9.4 the pollock fishery has evolved from a simple bottom trawl fishery into a very target selective pelagic trawl fishery in both the GOA & BS. It further improved in the BS under the AFA Cooperative that only fishes pollock with a pelagic trawl. The AFA also improved under AFA because those BS regulations limited BS pollock vessels from competing with GOA pollock vessels. The bottom trawl pollock fishery was fairly non-selective to the target	

sized pollock which the fishery was pursuing and instead encountered significant quantities of crab and halibut PSCs, bycatch of cod, flatfish and other benthic fishes, non-target sized pollock and bottom invertebrates (as a modern reference see the diversity of catch that occurs in the annual and biannual NMFS summer bottom trawl surveys). The modern pelagic trawl is very selective, with BS discards only about 1%, the AI bycatch is mostly rockfish (POP) and may reach 2% in parts of the GOA.

http://www.afsc.noaa.gov/RACE/surveys/cruise_results.htm
http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf

Though the pollock fishery no longer targets pollock with bottom trawl gear, and catches very few halibut, the fishery still participates in quick return of halibut when they are encountered after an IPHC research cruise found that trawl caught halibut that were returned to the water within 20 minutes had an 80% survival rate.
http://www.iphc.int/research/243-bycatch-cruise93.html

This clearly exemplifies a fishery that uses gear, operational practices and rights based fishing to significantly reduce waste, discards and non-target species to reduce their footprint on the ecosystem.

Clause:

9.6 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 8.5.1

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**
9.6	**The intent of fishing selectivity and fishing impacts related regulations is not circumvented by technical devices and information on new developments and requirements is made available to all fishers (NPFMC, BOF).** The pollock fishery is already one of the most selective fisheries in the world, having only a 1 – 2% bycatch rate. Because of the AFA cooperative and the Council's NEPA process, technical advances that improve harvest and/or reduce bycatch are readily shared with the Council and the rest of industry. State and Federal regulations can be readily modified to address technical devices designed to circumvent the intent of law. Regulations are developed and adopted through a public process before the NPFMC and BOF. Regulations are readily available in written and electronic format. http://www.fakr.noaa.gov/npfmc/bycatch-controls/SalmonBycatch.html http://www.fakr.noaa.gov/regs/summary.htm http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-in/folioisa.dll/aac/query=[JUMP:%27Title5Chap28%27]/doc/%7B@1%7D?firsthit

Clause:	
9.7 **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 8.5.4***	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
9.7	**International cooperation (TSC, ICC) 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.** Fisheries researchers and scientists from Alaska work closely with those from Canada on assessing the health of groundfish populations in the North Pacific. The Technical Subcommittee (TSC) of the Canada-U.S. Groundfish Committee, was created by the International Trawl Fishery Committee (now the Canada-U.S. Groundfish Committee) at the latter's initial meeting in Seattle, Washington, on November 4, 1959. The committee meets annually. http://www.psmfc.org/tsc2/ Also, the International Symposium on the Biology and Management of Walleye Pollock was convened in 1988 in Anchorage, AK. Over 80 scientists from Russia, Japan, Canada, Korea, Poland, and the United States met to discuss the biology and management of walleye pollock, a white fish that is important to U.S. fishermen and processors for products such as surimi. The proceedings includes 43 papers on reproduction and life history, feeding and growth, recruitment, stock structure and assessment, ecosystem interaction, and management. Data on the distribution of pollock in Russian waters, previously inaccessible to Americans, were released in the book (AK-SG-89-01, 1989, 800 pp.). A second symposium in 2006 considered pollock (and cod) and climate change: "Resiliency of Gadid Stocks to Fishing and Climate Change". G.H. Kruse, K. Drinkwater, J.N. Ianelli, J.S. Link, D.L. Stram, V. Wespestad, and D. Woodby (editors) http://seagrant.uaf.edu/bookstore/pubs/AK-SG-08-01.html 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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. 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 Exclusive Economic Zones (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. These meetings have also resulted in US vessels doing acoustical surveys

	with Russian Federation scientists in the Federation's zone of the Bering Sea. <two links to this on Global's pollock Google document page> http://thomas.loc.gov/cgi-bin/cpquery/R?cp106:FLD010:@1%28hr195%29 Additionally the US is a signatory to the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea. (Called the Doughnut Hole Convention for short). Negotiations involving the U.S., the former Soviet Union, China, the Republic of Korea, Japan and Poland continued from 1991 to 1994. Finally in 1994, they entered into the Bering Sea Doughnut Hole Convention, whose purpose is to manage the pollock fishery the day fishing resumes. The goals of the Convention can be summarized as follows: (1) Set up an international framework for the conservation, management and optimum utilization of pollock in the area; (2) Restore and maintain the pollock fishery at levels which will permit their maximum sustainable yield; (3) Cooperate in the collection and examination of data concerning pollock and other marine living resources in the Doughnut Hole; and (4) Provide a forum in which to consider the establishment of conservation and management measures for living marine resources other than pollock as may be required in the future. Meetings may also discuss technical and operational aspects of fishery management. http://www.eoearth.org/article/Convention_on_the_Conservation_and_Management_of_Pollock_Resources_in_the_Central_Bering_Sea	

Clause: **9.8 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 behaviour 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 8.5.3, 12.10***	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**	
Clause:	**Evidence**
9.8	**Alaska and the relevant institutions involved in the fishery collaborate in developing standard methodologies for research into fishing gear selectivity, fishing methods and strategies, and on the behaviour of target and non target species in relation to such fishing gear (Plan Teams) as an aid for management decisions and with a view to minimizing non-utilized catches.** See Clause 9.7 above, note particularly the two symposiums held on pollock and gadoids at the University of Alaska Wakefield Symposium series, and the international meetings where information is exchanged. National and international scientists that attend these meetings keep abreast of current developments in gear development and would advise each other of any new technology. Also, state, federal and academic

	biologists, researchers and economists comprise the NPFMC's Groundfish Plan Teams for both the BSAI and GOA. Discussions routinely cover fish gear, fishing methods and strategies. The NEPA analysis which accompanies all proposed actions of the Council would incorporate any information about gear selectivity, fishing methods or strategies, fish behavior or ecosystem components that might aid in formulating management decisions. http://www.fakr.noaa.gov/npfmc/membership/plan_teams/plan_teams.htm. Lastly, industry, NGOs or the public may submit proposals that consider these factors and they will be vetted through the NEPA analysis and public hearings.	

Clause:

9.9 Policies shall be developed for increasing stock populations and enhancing fishing opportunities through the use of artificial structures, placed with due regard to the safety of navigation.

FAO CCRF 8.11.1

9.9.1 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 safety of navigation are observed.

FAO CCRF 8.11.2

9.9.2 States shall, within the framework of coastal area management plan, establish management systems for artificial reefs and fish aggregation devises. 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 8.11.3

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence	
9.9	**There has been little effort or need to enhance habit through construction of artificial structures. These would obstruct fishing.** Alaska's waters and rearing habitat are pristine, and extremely productive. The pollock population remains healthy. Other than a very few man made reefs (usually unintentional vessel sinkings), there has been little effort or need to enhance habitat. These structures have had little to no impact on pollock in the area and are certainly	

	unlikely to attract pollock trawl fishing near such a bottom obstruction. Commercial quantities of Pollock are mostly found offshore in deep water, are pelagic foragers and do not seem to be attracted to structure, so there is no value in placing artificial structures to increase stocks. http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
9.9.1	**There has been little effort or need to enhance habit through construction of artificial structures. These would obstruct fishing.** See Clause 9.9.	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
9.9.2	**There has been little effort or need to enhance habit through construction of artificial structures. These would obstruct fishing.** See Clause 9.9.	

10. Fishing operations shall be carried out by fishers with appropriate standards of competence in accordance with international standards and guidelines and regulations. *FAO CCRF 8.1.7/8.1.10/8.2.4/8.4.5*						
Confidence Ratings	**Low**	**0 out of 3**	**Medium**	**0 out of 3**	**High**	**3 out of 3**

Clause:	
10.1 States shall enhance through education and training programmes the education and skills of fishers and, where appropriate, their professional qualifications. Such programmes shall take into account agreed international standards and guidelines. *FAO CCRF 8.1.7, 8.4.1*	
Evidence adequacy rating: ☑High ☐ Medium ☐ Low	
Clause:	**Evidence**
10.1	**Alaska enhances through education and training programmes the education and skills of fishers and, where appropriate, their professional qualifications (AVTEC). Such programmes take into account agreed international standards and guidelines.** The North Pacific Fishing Vessel Owners association (NPFVO) provides a large and diverse training program that many of the professional pollock 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 http://www.npfvoa.org/ ; http://www.adn.com/2011/04/27/1832381/workplace-fatalities-fall-sharply.html#ixzz1Xt1ESQqh. 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. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-

	compliant maritime training. (STCW is the international Standards of Training, Certification, & Watchkeeping.) In addition to the standard courses offered, customized training is available to meet the specific needs of maritime companies. Courses are delivered through the use of their world class ship simulator, state-of-the-art computer-based navigational laboratory, and modern classrooms equipped with the latest instructional delivery technologies. The Center's mission is to provide Alaskans with the skills and technical knowledge to enable them to be productive in Alaska's continually evolving maritime industry. Supplemental to their on-campus classroom training, the Alaska Maritime Training Center has a partnership with the Maritime Learning System to provide mariners with online training for entry-level USCG Licenses, endorsements, and renewals. The Center's course offerings include – Video Tutorials – * How to get your Merchant Mariner's Credential; * Which Course Do You Need? U.S. Coast Guard Approved/STCW-Compliant Courses – * Able Seaman; * Assistance Towing Operations; * Automatic Radar Plotting Aids (ARPA) Operations; * Basic Safety Training - STCW'95; includes: ** First Aid & CPR; ** Personal Safety and Social Responsibility; ** Basic Fire Fighting; ** Personal Survival Techniques; Bridge Resource Management (BRM); Global Maritime Distress & Safety System (GMDSS); * Master Not More Than 200 Tons Program; * Meteorology; * Operator of Uninspected Passenger Vessels (OUPV); * Proficiency in Survival Craft; * Qualified Member of Engine Department (QMED) Oiler; * Radar Observer (Unlimited), Original; * Radar Observer (Unlimited), Refresher; * Radar Observer (Unlimited), Recertification; * Rating Forming Part of a Navigational Watch; * Seafood Processor Orientation and Safety Course; * Shipboard Emergency Medicine. * Tankship – Dangerous Liquids (P.I.C.); * Visual Communications/Flashing Lights; * Medical Care Provider Additional AVTEC Maritime Courses	

	* FCC Marine Radio Operators Permit Examination The University of Alaska Sea Grant Marine Advisory Program (MAP) provides education and training in several other sectors, including – * better process control; * HACCP (Hazard Analysis / Critical Control Point); * sanitation control procedures; * marine refrigeration technology; * net mending; * icing & handling; * direct marketing; * financial management for fishermen; * maximizing fuel efficiency In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit. Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation, to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. In addition to this, MAP provides to training and technical assistance to fishermen and seafood processors in Western Alaska. Following completion of a needs assessment in year one of the project, 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. ***sources of evidence –*** http://www.avtec.edu/AMTC.htm http://www.stcw.org/ http://seagrant.uaf.edu/map/ http://seagrant.uaf.edu/map/fishbiz/index.php http://www.sfos.uaf.edu/fitc/academicprograms/ http://www.npfvoa.org/ http://www.adn.com/2011/04/27/1832381/workplace-fatalities-fall-sharply.html#ixzz1Xt1ESQqh http://www.sfos.uaf.edu/pcc/projects/07/brown/	

Clause:		
10.2	States, with the assistance of relevant international organizations, shall endeavour to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of this Code, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations. ***FAO CCRF 8.1.10***	
Evidence adequacy rating:		
☑**High**	☐ **Medium**	☐ **Low**

Clause:	Evidence	
10.2	**Alaska endeavours to ensure through education and training that all those engaged in fishing operations be given information on the most important provisions of the FAO Code of Conduct for Responsible Fisheries, as well as provisions of relevant international conventions and applicable environmental and other standards that are essential to ensure responsible fishing operations.** 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. In addition, MAP conducts sessions of their Alaska Young Fishermen's Summit. Each Summit is an intense, 3-day course in all aspects of Alaska fisheries, from fisheries management & regulation (eg- MSA), to seafood markets & marketing. The target audience for these Summits is young Alaskans from coastal communities. While there is not much education and training which explicitly deals with the Code, the Alaska fishery management process itself is an excellent *de facto* educational process. Alaska's fisheries are extremely compliant with the Code, as demonstrated by the Alaska Seafood Marketing Institute's checklist. Therefore, anyone who seeks to understand Alaska's fisheries management process unavoidably winds up becoming very familiar with the Code. http://seagrant.uaf.edu/map/ http://sustainability.alaskaseafood.org/fao	

Clause:
10.3 **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 8.1.8***
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
10.3	**Alaska maintains records of fishers (RAM, CFEC), whenever possible, contain information on their service and qualifications, including certificates of competency, in accordance with national laws.** The Restricted Access Management Program (RAM) is responsible for managing Alaska Region permit programs, including those that limit access to the Federally-managed fisheries of the North Pacific. 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 to qualified individuals in both limited and unlimited fisheries, and provides due process hearings and appeals as and when needed. The RAM division as well as the CFEC maintain on their websites, all the fishermen records for which fishing permits are issued (http://www.fakr.noaa.gov/ram/ , http://www.cfec.state.ak.us/).	

E. Implementation, Monitoring and Control

11. **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 7.1.7/7.7.3/7.6.2/8.1.1/8.1.4/8.2.1*** ***FAO Eco 29.5***						
Confidence Ratings	**Low**	**0 out of 6**	**Medium**	**0 out of 6**	**High**	**6 out of 6**

11.1. **Effective mechanisms shall be established for fisheries monitoring, surveillance, control and enforcement measures including, where appropriate, observer programmes, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the fishery in question.** ***FAO CCRF 7.1.7 Others 7.7.3, 8.1.1*** ***Eco 29.5***	
Evidence adequacy rating: **☑High** **☐ Medium** **☐ Low**	
Clause:	**Evidence**
11.1	**Effective mechanisms are established for fisheries monitoring, surveillance, control and enforcement measures including, an observer programme, inspection schemes and vessel monitoring systems, to ensure compliance with the conservation and management measures for the pollock fishery.** The Alaska pollock fishery fleet uses enforcement measures including an observer program, vessel monitoring systems on board vessels and USCG boardings and inspection activities. Details of the observer program and coverage in the Alaska pollock fishery are provided in Clause 4.2. of the Assessment Report. In regards to VMS requirements, on January 8, 2002, an emergency interim rule (67 FR 956) was issued by NMFS to implement Steller sea lion protection measures. All vessels using pot, hook-and-line or trawl gear in the directed fisheries for pollock, Pacific cod or Atka mackerel are now required to have an endorsement on their federal fisheries permit. Section 679.7(a)(18) requires all vessels using pot, hook-and-line or trawl gear that are permitted to directly fish for Pacific cod, Atka mackerel or pollock to have an operable VMS. This requirement is necessary to monitor fishing restrictions in Steller sea lion protection and forage areas. Also, when the vessels are

	fishing pollock in the state parallel fishery, they would use their VMS as directed by their federal fishing permit. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations, especially 50CFR679. 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. According to OLE – > "While a vast majority of commercial and recreational fishermen comply with the enacted conservation measures, there are still those fishermen - both domestic and foreign - who attempt to thwart the law and conduct fraudulent business. In recent years, the OLE has stepped up its presence in the international scene as more and more fish are imported and exported into and out of the United States. > "Major fishing companies, commercial fishermen, recreational boaters and sport fishermen and other ocean users are ultimately responsible for the conservation of the ocean, therefore they must be vigilant of their actions which might inflict damage upon the numerous ecosystems within our oceans. > "While catches are usually seized at the onset of an investigation, violators can also be assessed both civil penalties and criminal fines; and on occasion boats are seized and individuals are sent to Federal prison. > "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)." GCEL can then assess a civil penalty in the form of a Notice of Permit Sanctions (NOPs) or Notice of Violation and Assessment (NOVAs), or they can refer the case to the U.S. Attorney's Office for criminal proceedings. For perpetual violators or those whose actions have severe impacts upon the resource criminal charges may range from severe monetary fines, boat seizures and/or imprisonment may be levied by the United States Attorney's Office. 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) the Alaska Administrative Code (5 AAC 39.130 Reports required of processors, buyers, fishermen, and operators of certain commercial fishing vessels; transporting requirements). OLE mainly operates on shore, USCG at sea, and the AWT enforce heavily on shore. ADFG field staff is properly trained and can also make arrests. http://elandings.alaska.gov/	

	Compliance is ensured by audits of reports, inspection of catches, and in-season monitoring on the fishing grounds. 50CFR679: www.fakr.noaa.gov/regs/default.htm NMFS OLE, Alaska region: www.nmfs.noaa.gov/ole/ak_alaska.html USCG, Alaska region: www.uscg.mil/d17/	

Clause:

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

FAO CCRF 7.6.2 Other 8.1.2, 8.2.1

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
11.2	**Fishing vessels are allowed to operate on the resource in question without specific authorization.** Every fishing vessel targeting pollock in Alaska is required to have a federal or state permit. See the RAM and CFEC websites as well as Clause 10.3 for more details. http://www.fakr.noaa.gov/ram/ ; http://www.cfec.state.ak.us/	

Clause:

11.3 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 8.1.4

11.3.1 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.

FAO CCRF 7.7.5, 8.3.1

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence
11.3	**States involved in the pollock fishery, 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 (Donut Hole Agreement).** Alaska pollock is harvested in the Alaska EEZ. The "Donut Hole" agreement (see Section 1 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, Russia-see clause 1.2 for stock assessment and ICC agreement). This area is subject to international agreement with other member countries (i.e. Russia, Japan etc…) and is under fishing moratorium since the mid 1990s. The Central Bering Sea Fisheries Enforcement Act prohibits vessels and nationals of the United States 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 United States and the Russian Federation are parties. Any violation shall be subject to civil penalties and permit sanctions under section 308 of the Magnuson Fishery Conservation and Management Act. The USCG monitors vessels transiting and operating in the Donut Hole, and takes appropriate action as needed. Also of note the ICC (see Clause 1.3) agreement between Russia and Alaska. As an example, the USCG enforces high seas fishing regulation. This is one case reported in October 16, 2011, by NMFS Office of Law Enforcement highlighting U.S. actions against illegal high seas fishing. **Dutch Harbor, Alaska —** The U.S. Coast Guard transferred possession of the Bangun Perkasa to NOAA's Office of Law Enforcement Saturday evening at about 7 p.m., shortly after the vessel came to port in Dutch Harbor. After it was determined to be a stateless vessel, the Bangun Perkasa was seized by the Coast Guard about a month ago for high-seas drift net fishing more than 2,600 miles south west of Kodiak, Alaska. The vessel had over 10 miles of drift net on board and was detected dragging over 2 nautical miles of drift net, a practice universally condemned for indiscriminately killing massive amounts of fish and marine life. The seizure highlighted international cooperative efforts to combat illegal, unreported and unregulated fishing—considered to be a serious threat to American fishing jobs and communities, as well as to the health of the world's oceans.

	A Coast Guard cutter escorted the 140-foot vessel to 12 nautical miles off Unalaska Island, but could not allow it to moor in Dutch Harbor until the rat population aboard the vessel could be exterminated. NOAA's Office of Law Enforcement will have the ship surveyed to determine the value of vessel as well as the catch product aboard – 30 tons of squid and 30 sharks. NOAA, working with the Office of the U.S. Attorney in Anchorage, is seeking forfeiture of the vessel and its catch. Federal law stipulates a process where the owner has a reasonable time to come forward and claim the vessel. If the owner of the vessel does not come forward after due process is followed, all alternatives to dispose of the vessel will be considered to find the most effective course of action. This legal process needs to run its course before any decision regarding disposition of the vessel or catch can be made. Once the investigation of the Bangun Perkasa's fishing activity is completed, NOAA will forward its findings to the U.S. Attorney's Office. http://www.fao.org/fishery/shared/faolextrans.jsp?xp_ISIS_MFN=003635&xp_faoLexLang=E&xp_lang=en http://www.nmfs.noaa.gov/ole/news/2011/10/16_bangun_perkasa_nr.htm	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
11.3.1	**States members of or participants in sub-regional or regional fisheries management organizations or arrangements (Donut Hole Agreement, ICC) 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.** 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 ICC is responsible for furthering the objectives of the Comprehensive Fisheries Agreement. 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 Exclusive Economic Zones (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. These meetings have also resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea. http://thomas.loc.gov/cgi-bin/cpquery/R?cp106:FLD010:@1%28hr195%29	

	There is also a public report at Council of high seas enforcement from the Coast Guard. Regular notifications of the kind of national and international infringement is given at the Council 5 times a year from the USCG (including pollock boats at US/Russia boundary line). The Donut Hole in the Central Bering Sea is subject to international agreement with other member countries (i.e. Russia, Japan etc…) and is under fishing moratorium since the mid 1990s. The agreement and fishing moratorium is specific for Alaska pollock. Please see Clause 11.3 for further details.	

Clause:

11.4 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 8.2.2

11.4.1 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 8.2.3

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	Evidence	
11.4	**No foreign fleet is allowed to fish for pollock in Alaska waters.** By 1988 the whole of the fleet was US, no foreign fleet was allowed. Please see Clause 11.3 for further details.	

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	Evidence	
11.4.1	**No foreign fleet is allowed to fish for pollock in Alaska waters.** By 1988 the whole of the fleet was US, no foreign fleet was allowed. Please see Clause 11.3 for further details.	

12.	There shall be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations. *FAO CCRF 7.7.2/8.2.7*				
Confidence Ratings	**Low**	**0 out of 4**	**Medium**	**0 out of 4**	**High**	**4 out of 4**

Clause:

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

12.1.1 Sanctions shall 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 7.7.2/8.1.9/8.2.7

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
12.1	**National laws of adequate severity are in place to provide for effective sanctions.** In Alaska waters, enforcement policy section 50CFR600.740 states – (a) The MSA provides four basic enforcement remedies for violations, in ascending order of severity, as follows: (1) Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E). (2) Assessment by the Administrator of a civil money penalty. (3) For certain violations, judicial forfeiture action against the vessel and its catch. (4) Criminal prosecution of the owner or operator for some offenses. 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. (b) Processing a case under one remedial form usually means that other remedies

are inappropriate in that case. However, further investigation or later review may indicate the case to be either more or less serious than initially considered, or may otherwise reveal that the penalty first pursued is inadequate to serve the purposes of the MSA. Under such circumstances, the Agency may pursue other remedies either in lieu of or in addition to the action originally taken. Forfeiture of the illegal catch does not fall within this general rule and is considered in most cases as only the initial step in remedying a violation by removing the ill-gotten gains of the offense.

(c) If a fishing vessel for which a permit has been issued under the MSA is used in the commission of an offense prohibited by section 307 of the MSA, NOAA may impose permit sanctions, whether or not civil or criminal action has been undertaken against the vessel or its owner or operator. In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator. The State of Alaska also has a very aggressive marine fisheries compliance program with stiff penalties if a vessel is caught in non-compliance.

The recent news story on October 16th, 2011, of the apprehension of the illegal driftnet vessel offshore of Dutch Harbour highlights the gravity of sanctions in the event of fishery law infringement. NOAA, working with the Office of the U.S. Attorney in Anchorage, is seeking forfeiture of the vessel and its catch. Federal law stipulates a process where the owner has a reasonable time to come forward and claim the vessel. If the owner of the vessel does not come forward after due process is followed, all alternatives to dispose of the vessel will be considered to find the most effective course of action. This legal process needs to run its course before any decision regarding disposition of the vessel or catch can be made. Once the investigation of the Bangun Perkasa's fishing activity is completed, NOAA will forward its findings to the U.S. Attorney's Office.

Marine Division of AWT and the State of Alaska Department of Law pursue a very aggressive enforcement policy. They attend the BOF and are integral into the process for formulation or legislation, analogous to the USCG attendance and input in the Council process.

50CFR600.740 Enforcement policy http://www.law.cornell.edu/cfr/text/50/600/740

http://www.nmfs.noaa.gov/ole/news/2011/10/16_bangun_perkasa_nr.htm

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
12.1.1	**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.**

Please see evidence in section 12.1 above and details provided in the “Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions” issued by NOAA Office of the General Counsel – Enforcement and Litigation - March 16, 2011. This Policy provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The purpose of this Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources. Under this Policy, NOAA expects to improve consistency at a national level, provide greater predictability for the regulated community and the public, improve transparency in enforcement, and more effectively protect natural resources.

For significant violations, the NOAA attorney may recommend charges under NOAA’s civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney’s office for criminal prosecution (http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf).

Here below is presented a table of the boardings the USCG made for fiscal year 2010/2011 on pollock vessels.

Boardings for Fiscal Year 2011 (01 October 2010 - 30 September 2011)					
Date	**Vessel Name**	**Type**	**Doc #**	**SPECIES**	**AREA**
04/10/2010	OCEAN EXPLORER	FTS	678236	270	517
06/10/2010	SEA MAC	FTS	525516	270	610
07/10/2010	GAYLA MAUREEN	FTS	515537	270	610
07/10/2010	LADY LEE DAWN	FTS	632516	270	610
24/01/2011	NORTHERN VICTOR	FPS	248959	270	610
04/02/2011	ALEUTIAN CHALLENGER	FTS	565017	270	517
14/02/2011	AMERICAN DYNASTY	FTS	951307	270	509
26/02/2011	AURIGA	FTS	639547	270	517
05/03/2011	AMERICAN BEAUTY	FTS	613847	270	509
05/03/2011	NORTHERN PATRIOT	FTS	637744	270	509
09/03/2011	ARCTIC STORM	FTS	903511	270	521

10/03/2011	DUSK	FTS	7513342	270	630
10/03/2011	EXCALIBUR II	FTS	636602	270	630
10/03/2011	WALTER N	FTS	257365	270	630
14/03/2011	VESTERAALEN	FTS	611642	270	521
15/03/2011	OCEAN HOPE III	FTS	652397	270	517
18/03/2011	NEW LIFE	FTS	504299	270	630
23/03/2011	VANGUARD	FTS	617802	270	519
26/03/2011	DOMINATOR	FTS	602309	270	517
26/03/2011	VIKING	FTS	565017	270	517
28/03/2011	WESTERN DAWN	FTS	628313	270	521
16/04/2011	WINDJAMMER	FTS	515274	270	509
12/06/2011	ARTIC FJORD	FTS	940866	270	523
12/06/2011	NORTHERN HAWK	FTS	643771	270	523
13/06/2011	KODIAK ENTERPRISE	FTS	579450	270	523
13/06/2011	OCEAN ROVER	FTS	552100	270	523
13/06/2011	PACIFIC GLACIER	FTS	433627	270	523
18/06/2011	MARK 1	FTS	509552	270	517
18/06/2011	NORDIC STAR	FTS	584684	270	517
18/06/2011	PACIFIC PRINCE	FTS	697280	270	517
18/06/2011	VIKING EXPLORER	FTS	605228	270	509
29/06/2011	ALASKAN COMMAND	FTS	599383	270	509
30/06/2011	OCEAN PHOENIX	FPS	296779	270	509
30/06/2011	PACIFIC CHALENGER	FTS	518937	270	509
01/07/2011	ALSEA	FTS	626517	270	513
01/07/2011	BRISTOL EXPLORER	FTS	647985	270	513
01/07/2011	CHELSEA K	FTS	976753	270	513
11/07/2011	ARGOSY	FTS	611365	270	521
12/07/2011	ALASKA ROSE	FTS	610984	270	521
12/07/2011	STARBOUND	FTS	944658	270	521
12/07/2011	STARFISH	FTS	561651	270	521
12/07/2011	TRAVELER	FTS	929356	270	521
14/07/2011	ARCTIC EXPLORER	FTS	936302	270	513
14/07/2011	ELIZABETH F	FTS	526037	270	509
29/07/2011	GOLDEN PISCES	FTS	599585	270	517
15/08/2011	HICKORY WIND	FTS	594154	270	517
15/08/2011	MAJESTY	FTS	602309	270	517
23/08/2011	DESTINATION	FTS	571879	270	517
25/08/2011	COMMODORE	FTS	914214	270	509
25/08/2011	LESLIE LEE	FTW	584873	270	517
26/08/2011	STORM PETREL	FTS	620769	270	519
04/09/2011	LONESTAR	FTS	520494	270	630

Here below are also presented the fishing vessel violations for 2008-2010 as reported by the USCG to the NPFMC (http://www.alaskafisheries.noaa.gov/npfmc/resources-publications/summary-reports.html):

2008	2009	2010
2 Prohibited Species Retention. 3 Failure to Retain Bycatch. 1 Quota Overage. 1 VMS Inoperative. 1 Insufficient Observer Coverage. 2 License/License Holder Not On Board. 21 Failure to Maintain Logbooks.	2 Operating Inside No-Transit Zone. 3 Fishing in Closed Areas. 2 VMS Inoperative. 2 Insufficient Observer Coverage. 3 License/License Holder Not On Board. 15 Failure to Maintain Logbooks. 8 Insufficient Boarding Ladder.	11 Logbook. 08 Boarding Ladder. 05 Gear. 13 Catch. 10 Permit. 02 Observer Coverage. 11 Closed Area. 01 VMS.

Clause:

12.2 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.

12.2.1 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.

FAO CCRF 8.2.7

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
12.2	**Enforcement measures are in place in respect of fishing vessels found to have contravened applicable conservation and management measures, including, where appropriate, making the contravention of such measures an offence under national legislation.** No foreign fleet fishes pollock within Alaska's EEZ. Please see evidence provided in Section 12.1 and 12.1.1.

Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
12.2.1	**Sanctions applicable in respect of violations and illegal activities are adequate in severity to be effective in securing compliance and discouraging violations wherever they occur.** Please see evidence provided in Section 12.1 and 12.1.1.	

F. Serious Impacts of the Fishery on the Ecosystem

13. **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 7.2.3/8.4.7/8.4.8/12.11*** ***Eco 29.3/31***						
Confidence Ratings	**Low**	**0 out of 13**	**Medium**	**0 out of 13**	**High**	**13 out of 13**

Clause:

13.1 **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 7.2.3

13.1.1 **Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected.**

FAO CCRF 7.2.2

13.1.2 **The most probable adverse impacts of the fishery on the ecosystem/environment shall be considered, taking into account available scientific information, and local knowledge.**

Eco 31

13.1.3 **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.**

Eco 30.4, 31.4

13.1.4 **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.**

Eco 29.3,29.4, 31

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence
13.1	**Alaska's fisheries management organizations 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 (Pollock SAFE, Ecosystems SAFE).** NPFMC, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors on pollock and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem Considerations documents, and other research reports outlined below. **SAFE documents.** In addition, Stock Assessment and Fishery Evaluation (SAFE) documents for BSAI and GOA pollock summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the pollock fishery on the ecosystem. Since 2003, SAFE documents for BSAI and GOA have also included an annual summary Ecosystem Assessment in the appendix prepared by the Resource Ecology and Ecosystem Management group at the Alaska Fishery Science Center (AFSC). The primary intent of the assessment is to summarize historical climate and fishing effects of the shelf and slope regions of the eastern BSAI, and GOA, and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function from an ecosystem perspective. It also looks at the effects of environmental change on fish stocks. Since 1999, the section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures. SAFE reports also describe results of first-order trophic interactions for pollock from the ECOPATH model, an ecosystem modeling software package. While prominence of some interactions may be the result of insufficient data, estimation of prey interactions of adult pollock in the GOA appear reasonable. **Sources of evidence:** http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/AIpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/BOGpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf The *Ecosystem Considerations* sections from 2000 and NMFS ecosystem modeling plans are available at www.afsc.noaa.gov/refm/reem/Assess/Default.htm. For 2010, see Appendix C *Ecosystem Considerations for 2011* http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf

	FATE research. NOAA also supports the Fisheries And The Environment (FATE) program to ensure the sustainable use of US fishery resources under a changing climate. The focus of FATE is on the development, evaluation, and distribution of leading ecological and performance indicators. In 2006 & 2007, a number of FATE projects included a study to integrate pollock environmental variables. http://fate.nmfs.noaa.gov/projects PICES Special Publication 1: Marine Ecosystems of the North Pacific. The North Pacific ecosystem status report is a contribution by the North Pacific Marine Science Organization (PICES) to identify, describe, and integrate observations of change in the North Pacific Ocean that are occurring now, and have occurred during the past several years; it will remain a work-in-progress. Publication 1 represents the first attempt to describe, in a systematic and integrated fashion, the state of the North Pacific Ocean. This first step describes the present state of the marine ecosystems of the North Pacific Ocean (status), in the context of their recent past (last five years) and longer variability (trends); it summaries regional assessments into a broad basin-wide synthesis; identifies critical factors that cause changes in these ecosystems; and it identifies key questions and critical data gaps that inhibit understanding of these marine ecosystems http://www.pices.int/publications/special_publications/NPESR/2005/npesr_2005.aspx The North Pacific Research Board (NPRB) was created by Congress in 1997 to conduct research activities on or relating to the fisheries or marine ecosystems in the North Pacific Ocean, Bering Sea, and Arctic Ocean with a priority on cooperative research efforts designed to address pressing fishery management or marine ecosystem information needs. While the NPRB has invested millions of dollars on obtaining this objective, they have also developed two special projects that seek to understand the integrated ecosystems of the BSAI and GOA. For the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the $17.6 million Gulf of Alaska 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 .The study includes two field years (2011 and 2013) followed by one synthesis year. http://gulfofalaska.nprb.org/ For the Bering Sea, a large multiyear ecosystem project is winding towards completion. It consists of two large projects that will be integrated. One funded by the National Science Foundation (NSF's BEST program is the Bering Ecosystem STudy, a multi-year study (2007-2010)). The other funded by NPRB (BSIERP, is the Bering Sea Integrated Ecosystem Research Program (2008-2012)). The overlapping goals of these projects led to a partnership that brings together some $52 million worth of ecosystem research over six years, including important contributions by NOAA and the US Fish & Wildlife Service. From 2007 to 2012, NPRB, NSF, and project partners are combining talented scientists and resources for three years of field research on the eastern Bering Sea Shelf, followed by two more years for analysis and reporting. http://bsierp.nprb.org/focal/index.html Impacts of a Warming Arctic - by Arctic Climate Impact Assessment, pp. 144. ISBN 0521617782. Cambridge, UK: Cambridge University Press, December 2004. While this project focuses on the Arctic, significant information about the Bering Sea

and the GOA are incorporated into this climate review document. It notes that the Arctic is now experiencing some of the most rapid and severe climate change on earth. Over the next 100 years, climate change is expected to accelerate, contributing to major physical, ecological, social, and economic changes, many of which have already begun. Changes in arctic climate will also affect the rest of the world through increased global warming and rising sea levels.
http://www.acia.uaf.edu

The Council has been concerned that the warming Arctic and Bering Sea may cause groundfish to migrate more northward. Some recent research indicates that cold pools of water near the bottom may keep pollock from moving north into the Arctic: As scientists observed climate warming in the Bering Sea, they suspected valuable commercial fish species such as Pacific cod and walleye pollock would move north toward the Bering Strait and into the Arctic Ocean. Scientists say a pool of cold water in the northern Bering Sea has been a locked door to the northward migration of pollock and cod. Water along the ocean floor where pollock live has been kept cold by the layer of sea ice that forms every winter on the surface of the northern Bering Sea. That ice is expected to persist even with climate warming. Cold water sets up below the ice layer and remains cold throughout the summer.

http://juneauempire.com/state/2011-10-24/bering-sea-study-detects-cold-pool-keep-valuable-walleye-pollock-cod-moving-north

The Final Programmatic Supplemental Environmental Impact Statement is an extensive review of the Alaska Groundfish Fisheries (PSEIS) (NMFS 2004). It provides information about effects of the fishery on the ecosystem and effects of the ecosystem on the groundfish fishery.

http://alaskafisheries.noaa.gov/sustainablefisheries/seis/final062004/Exec_sum.pdf
http://alaskafisheries.noaa.gov/sustainablefisheries/seis/final062004/Chaps/chpt_3/chpt_3_5.pdf
http://alaskafisheries.noaa.gov/sustainablefisheries/seis/final062004/Chaps/chpt_3/chpt_3_10.pdf

Lastly, the Council has and will continue to consider habitat protection measures, they are particularly tasked with the assessment of Essential Fish Habitat as it pertains to managed species (i.e., pollock).

http://www.fakr.noaa.gov/npfmc/conservation-issues/habitat-protections.html

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence
13.1.1	**Adverse environmental impacts on the resources from human activities are assessed and, where appropriate, corrected (NEPA).** NEPA – The Council's analytical review documents that evaluate proposed changes to the conservation and management of groundfish and shellfish stocks for which they are responsible, are NEPA compliant documents. This means that adverse environmental impacts to the resource from human activities are assessed and, where appropriate, corrected. These documents are widely distributed and made available so that the public at large and other natural resource, management or development agencies will have an opportunity to testify or comment on possible impacts to their sphere of influence. In like manner, when other resource, development or management agencies that receive federal funds wish to implement new activities or develop new regulations that may impact fisheries under the auspicious of the Council, they must also develop NEPA documents which show their project's plan conform to existing Council FMPs and seek comments from the Council on ways that their proposed activities may impact the Council. http://www.eli.org/seminars/event.cfm?eventid=445 (NEPA at 40: How a Visionary Statute Confronts 21st Century Environmental Impacts -- Co-sponsored by: The Environmental Law Institute, The George Washington University Law School and The Council on Environmental Quality). A review of the beneficial effects of NEPA on developing regulations is discussed and provides insight on the NEPA analysis to provide public and state and federal agency reviews to proposed processes that can impact the public and its businesses. Specifically, NEPA requires federal agencies to prepare Environmental Assessments or Environmental Impact Statements prior to making decisions. The President's Council on Environmental Quality, referred to as CEQ, which was established along with NEPA, has adopted regulations and other guidance that provide general procedures for federal agencies to follow when preparing these documents. Moreover, each federal agency has adopted its own detailed NEPA procedures, and the federal courts, after more than 30 years of litigation, have played a major role in shaping NEPA's interpretation and implementation. http://www.solano.com/pdf/N20_TOC.pdf (The NEPA Book) or http://www.solano.com/old_site_02/oldsite/bookinfo_nepa.htm

Evidence adequacy rating:	
☑High ☐ Medium ☐ Low	
Clause:	**Evidence**
13.1.2	**The most probable adverse impacts of the fishery on the ecosystem/environment are considered (PSEIS, SAFE's Ecosystem chapter), taking into account available scientific information, and local knowledge.** **Ecosystem impact of the fishery.** The PSEIS document provides evidence that physical oceanographic factors, particularly climate, have a controlling influence on biological community composition in the BSAI and GOA. An important conclusion to be drawn from these studies is that any effects of human activities on the marine environment should be considered in the context of the powerful physical forces that appear to be driving the BSAI and GOA ecosystems. http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm Because the most obvious fishing effects (overharvest, uncontrolled bycatch or ecosystem effects on apex predators such as Steller sea lions) are closely accounted for in the Councils FMP, we look to the Ecosystem Chapters and the index analysis they provide to evaluate ecosystem fishing effects. An index that has been suggested as a measure of overall top-down control of the ecosystem due to fishing is the trophic level of the fishery; in particular, the notion of fishing down the food web has been popularized in recent years. The trophic level of the catch and the Fishery in Balance (FIB) indices have been monitored in the BS, AI, and GOA ecosystems to determine if fisheries have been "fishing-down" the food web by removing top-level predators and subsequently targeting lower trophic level prey. The FIB index was developed by Pauly et al. (2000) to ascertain whether trophic level catch trends are a reaction of deliberate choice or of a fishing-down the food web effect. This index declines only when catches do not increase as expected when moving down the food web (i.e., lower trophic levels are more biologically productive), relative to an initial baseline year. As in any single metrics of trophic level or FIB indices, however, this is best available science, yet it may hide details about fishing events that scientists can't discern. Actual area by area results are: The AI pollock Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the AI have been stable and close to their long-term means since 1999. The GOA Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the GOA have been stable and close to their long-term means since 1999. The BS Trophic Level of the Catch and the FIB (Fisheries in Balance) indices for the EBS have been stable and close to their long-term means since the 1970s (p. 204, Figure 8). Total catch was stable throughout the 2000s but has decreased recently.

	The ecosystem Chapter makes the following points about pollock fishing effects from these indexes: (1) Although there has been a general increase in the amount of catch since the late 1960s in all three areas of Alaska, the trophic level of the catch has been high and relatively stable over the last 25 years. (2) In general, it appears that fishing events on different species are episodic in the AI and GOA, while pollock steadily dominate catches in the BS throughout the period (Figure 109 in Ecosystem Chapter). (3) Stability in the trophic level of the total fish and invertebrate catches and FIB indices in the EBS, AI, and GOA indicate that the “fishing-down" effect is not occurring in these regions. Further examination supports the idea that fishing-down the food web is not occurring in Alaska, and there does not appear to be a serial addition of lower-trophic-level fisheries in the EBS or GOA. http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf Effects of fishing on the seafloor near pollock habitat off Alaska have been largely described as less than minimum and less than temporary. The following site holds nearly 50 articles listed on the effects of trawling in general. http://access.afsc.noaa.gov/reem/ecoweb/html/EcoContribution.cfm?ID=19	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
13.1.3	**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 (Ecosystem chapters).** As detailed above in Clause 13.1.2 the Ecosystem Chapter provides a number of indices that are useful. As noted above, the index that has been suggested as a measure of overall top-down control of the ecosystem due to fishing is the trophic level of the fishery; in particular, the notion of fishing down the food web has been popularized in recent years. The trophic level of the catch and the Fishery in Balance (FIB) indices have been monitored in the BS, AI, and GOA ecosystems to determine if fisheries have been “fishing-down" the food web by removing top-level predators and subsequently targeting lower trophic level prey. The FIB for pollock displays stability. Two other indices that support this level of general stability are the Shannon-Wiener diversity index and the Species Richness index. While there are some recent declines, these are coming down from higher levels, and in the BS the trend is within 1 standard deviation of the mean. Lastly, it is important to focus on the SAFE documents that describe the pollock stock as healthy and not overfished; and the Council has provided	

	precautionary management to assure ecosystem needs are met. http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/AIpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/BOGpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
13.1.4	**Impacts that are likely to have serious consequences (overfishing, endangered species) are addressed.** Fishing impacts that are likely to have serious consequences and may need immediate management responses, or at least identify further analysis in need of completion would either have to deal with a stock that is overfished, or an endangered species that requires protection. A third possibility could be bycatch impacts that impact other fisheries. Since the pollock fishery is not overfished, or in danger of being overfished (see SAFE), and the current SSL Biological Opinion, where pollock fishing outside of the Central and Western Aleutian Islands has more than sufficient safeguards to protect SSL from any fishing induced affects, one must consider that these issues are accounted for. **Sources of evidence** http://www.fakr.noaa.gov/protectedresources/stellers/esa/biop/final/1210.htm http://wdfw.wa.gov/conservation/steller_sealions/final_fmp_biop_ind_sci_rev_08oct2011.pdf This leaves the recent and current concerns regarding salmon bycatch in pollock fisheries in the BS and GOA. Here the Council took the fairly immediate action to place new salmon bycatch controls on the pollock fishery. In the Bering Sea, the Council met with industry and Western Alaskan in-river fishermen concerned with the perceived impacts from salmon bycatch in the pollock fisheries. The Council took action in 2009 to recommend a new approach to managing Chinook salmon bycatch in the Bering Sea pollock fishery under Amendment 91. This new approach combines a limit on the amount of Chinook salmon that may be caught incidentally with incentive plan agreements and performance standards to reduce bycatch. This program was designed to minimize bycatch to the extent practicable in all years, prevent bycatch from reaching the limit in most years, while providing the pollock fleet with the flexibility to harvest the total allowable catch. This program was implemented by NMFS for the 2011 fishery.	

	In the GOA, Pacific salmon are taken as bycatch in the GOA groundfish fisheries, in which they are considered prohibited. Although five species of salmon are caught in the fisheries, the Council has been concerned about Chinook salmon, as the species with the highest bycatch in recent years. Chinook salmon bycatch primarily occurs in trawl fisheries, in the central and western regulatory areas. Between 2003 and 2010, the pollock target fishery accounted for an average of three-quarters of intercepted Chinook salmon, while other, primarily nonpelagic, trawl fisheries for flatfish, rockfish, and Pacific cod accounted for the remainder. In 2011, the Council approved Chinook salmon prohibited species catch (PSC) limits for the GOA pollock fisheries in the central and western regulatory areas. Once these annual limits are reached, the pollock fishery in the respective regulatory area will be closed. The Council is also considering other, comprehensive management measures to address Chinook salmon bycatch in the GOA trawl fisheries http://www.fakr.noaa.gov/npfmc/bycatch-controls/BSChinookBycatch.html http://www.fakr.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html	

Clause:

13.2 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 7.6.9
Eco 31.1

13.2.1 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; if serious risks of extinction arise, effective remedial action shall be taken.

Eco 31.1

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
13.2	**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 (PSC, area closures).** It is important to consider that before a fishery can take appropriate measures to minimize non target catch, waste and discards, the fishery must be appropriately assessed and its harvest observed. As described in Section 7 (B), Science and Stock Assessment Activities and 7 (C) the Precautionary Approach, the NMFS trawl survey (trawl and acoustical) assess the available BSAI and GOA fishery resources, as well as various other components of the ecosystem. NMFS makes best available science population estimates on stocks or stock complexes that will require conservation management decisions.	

All but the smallest vessels carry observers during all or a portion of their trip; and observers make estimates on both target and non-target harvest. It is the information from the stock assessment determinations and the harvests and discards described by the observer and the landings reports that provide the Council with the information to determine what the appropriate regulations or policies for controlling catch, waste and discards of non-target species. When a particular non-target bycatch becomes a concern, NMFS or NPRB might fund a special research project to determine the parameters of the bycatch problem. This was done in the longline fishery on seabird bycatch, and on determining handling mortality of released king and Tanner crab in pot fisheries. Clause 13.1.4 also described the issue of salmon bycatch, the NEPA analysis and the various alternatives for Council consideration.

Since the NMFS informed the Council about the precipitous decline in the Western discreet population of Steller sea lions in 1990, the NPFMC has acted in a precautionary manner to place protections around rookeries and haulouts and close areas where fishing may impact SSL prey. NMFS first declared that this part of the SSL population was Threatened and then determined that it was Endangered under the ESA. The Council and industry petitioned Congress for special research funds to attempt to determine what was causing the decline of SSL and whether fisheries might be involved in the decline or the delayed recovery of the Western population.

To date, nearly $200,000,000 was appropriated and provided in this research effort. No direct links between fishing and decline or delayed recovery of SSL were evident in this research. In fact, a reverse trend is observed when one plots abundance of pollock and cod against SSL. As the population of SSL declines, the biomass of cod and pollock increase. Never-the-less, because the agency must err on the side of precaution, NMFS implemented numerous protection measures over the years. And while part of the stock appears to be recovering, SSL in the Central and Western Aleutian Islands continue to show declines; so NMFS's most recent Biological Opinion indicates that there is still a likelihood of jeopardy from fishing in that area, so more restrictions were implemented.

A recent peer review of the latest Biological Opinion found the evidence lacking for their assertions. But precautionary protections will remain until such a time that these issues can be resolved and a new recovery plan can be formulated based on new findings.

Sources of evidence

http://www.wsg.washington.edu/communications/online/seabirds/seabirdintro.pdf
http://project.nprb.org/view.jsp?id=830b2825-1af7-4912-aced-0b3f90719056
http://alaskafisheries.noaa.gov/sustainablefisheries/bycatch/default.htm
http://www.fakr.noaa.gov/protectedresources/stellers/default.htm
http://wdfw.wa.gov/conservation/steller_sealions/fmp_biop_ind_sci_rev_21july2011.pdf

Evidence adequacy rating:		
☑High	☐ Medium	☐ Low

Clause:	Evidence
13.2.1	**Non target catches, including discards, of stocks other than the "stock under consideration" are monitored (observer program) and do not threaten these non-target stocks with serious risk of extinction; if serious risks of extinction arise, effective remedial action are taken (fishery closure).** As described in 13.2, the non-target catches and discards are assessed on board by observers or at the processing plant. For example, see Table 1.28 in the BS Pollock SAFE document. This lists all fish and invertebrate bycatch by year (1997-2010). None of the bycatch species are at known risk of extinction (but endangered salmon may be caught), and the pollock fishery must limit their catch of some species, or face having their directed harvest restricted. The recent GOA Pollock amendment package from the Council proposes management measures that would apply exclusively to the directed pollock fishery in the Western and Central GOA relative to salmon bycatch. Limited information on the origin of Chinook salmon in the GOA indicates that stocks of Asian, Alaska, British Columbia, and lower-48 origin are present, including Endangered Species Act-listed stocks. The measures under consideration include setting prohibited species catch (PSC) limits in the Central and Western GOA for Chinook salmon (*Oncorhynchus tshawytscha*), which would close the directed pollock fishery in those regulatory areas if attained, and increased observer coverage on vessels under sixty feet. At the time that the Council initiated this analysis, they identified that this amendment package should be moved forward on an expedited timeframe as the highest priority of Council actions currently under consideration. In April 2011, the Council identified a preliminary preferred alternative. The Council plans to take final action on this issue in June 2011, which could allow implementation of the proposed action in mid-2012. The PSEIS describes the evolution of non-target bycatch measures within the Council process. **Sources of evidence** http://access.afsc.noaa.gov/reem/ecoweb/Eco2010.pdf http://www.afsc.noaa.gov/REFM/docs/2010/EBSpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/AIpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/BOGpollock.pdf http://www.afsc.noaa.gov/REFM/docs/2010/GOApollock.pdf http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm http://www.fakr.noaa.gov/npfmc/PDFdocuments/bycatch/GOAChinookBycatch511.pdf

Clause:

13.3 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 measures shall be in place to avoid severe adverse impacts on dependent predators.

Eco 31.2

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	Evidence	
13.3	**The role of the "stock under consideration" in the food-web is considered. Management measures are in place to avoid severe adverse impacts on dependent predators (steller sea lions).** As seen in the previous clauses, 13.1, 13.1.2, 13.1.3, the Council, NMFS and other institutions (universities, PICES, NPRB) have studied pollock, and its place in the ecosystem. The SAFE documents from the various management areas and the Ecosystem Chapter describe how each of the life stages of pollock fit into the food web. Pollock, because it is such an abundant component of the ecosystem, is both a key prey species and a key predator species. Pollock form vast pelagic spawning aggregations in the winter and early spring. These aggregations are both important to fishermen and predators of pollock. Many of the pollock regulations promulgated by the Council address protections on the spawning stock, such as: prohibition on roe stripping, A/B-season apportionment of TAC, SSL protective closure areas where SSL forage, and closing the Bogoslof spawning area to all harvest. Eggs develop throughout the water column (70-80 m in the Bering Sea shelf, 150-200 m in Shelikof Strait). Egg to larvae development is dependent on water temperature, and may take 14-20 days. Larvae are also distributed in the upper water column, and larval period may last 60 days. The larvae eat progressively larger naupliar stages of copepods as they grow and then small euphausiids as they approach transformation to juveniles (~25 mm standard length). In the Gulf of Alaska, larvae are distributed in the upper 40 m of the water column and the diet is similar to Bering Sea larvae. FOCI survey data indicate larval pollock may utilize the stratified warmer upper waters of the midshelf to avoid predation by adult pollock which reside in the colder bottom water. Egg and larvae form an important food source for zooplankton and fish and shellfish whose life stages inhabit the pelagic zone. At age 1 pollock are found throughout the eastern Bering Sea both in the water column and on bottom. Age 1 pollock from strong year-classes appear to be found in great numbers on the inner shelf, and further north on the shelf than weak year classes which appear to be more concentrated on the outer continental shelf. From age 2-3 pollock are primarily pelagic and then to be most abundant on the outer and mid-shelf northwest of the Pribilof Islands.	

	As pollock reach maturity (age 4) in the Bering Sea, they appear to move from the northwest to the southeast shelf to recruit to the adult spawning population. Strong year-classes of pollock persist in the population in significant numbers until about age 12, and very few pollock survive beyond age 16. The oldest recorded pollock was age 31. Most of the pollock consumed by pollock are age 0 and 1 pollock, and recent research suggests that cannibalism can regulate year-class size. Weak year-classes appear to be those located within the range of adults, while strong year-classes are those that are transported to areas outside the range of adult abundance. Being the dominant species in the eastern Bering Sea pollock is an important food source for other fish, marine mammals, and birds. On the Pribilof Islands hatching success and fledgling survival of marine birds has been tied to the availability of age 0 pollock to nesting birds. Other than adult pollock, Pacific cod and Arrowtooth flounder are two of the main fish predators. Arrowtooth are very abundant in both the BS and GOA and appear to prey heavily on 0 and 1 age pollock. And young marine mammals (fur seals and SSL) may target younger pollock. Council management of the pollock stocks accounts for the various ecosystem needs, and their decisions are constantly up-dated with the annual Ecosystem Chapter and the various research projects that are shared with the Council from NMFS, Universities, NPRB and others. Sources of Evidence http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmpAPPENDIX.pdf See also the Sources of Evidence in clauses, 13.1, 13.1.2, 13.1.3.	

Clause:

13.4 Pollution, waste, catch by lost or abandoned gear are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.

FAO CCRF 7.2.2

13.4.1 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 there to (MARPOL 73/78).

FAO CCRF 8.7.1

Evidence adequacy rating:

☑High ☐ Medium ☐ Low

Clause:	Evidence	
13.4	**Pollution, waste, catch by lost or abandoned gear are minimized, through measures including, to the extent practicable, the development and use of selective, environmentally safe and cost effective fishing gear and techniques.** As described previously the only allowed gear to harvest pollock is the pelagic trawl. Because of its design and the preferred habitat of target sized pollock, it is not fished in areas where it is likely to become tangled with the bottom. Never-the-less, the rare instance may occur and a net may become lost or more likely become unusable and need to be replaced. EPA and Alaska Department of Environmental Conservation (ADEC) Regulations are in place that required used gear to be landed in ports for disposal. The industry has been involved in a federally funded multiyear gear clean up that has members of each coastal community conducting beach clean-up of all plastics and other fishery related materials which are gathered and shipped to disposal or recycling facilities. Other types of pollution (oil, chemicals, waste, harmful substances and garbage are controlled under MARPOL and implemented under US Coast Guard, EPA or ADEC regulations. Their regulations are in many cases more stringent and broader in nature. All of these agencies have regulations that require individuals or industry to comply with their standards and expeditiously report any infractions to those regulations. http://www.mcafoundation.org/marine.html http://www.imo.org/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol) http://www.uscg.mil/top/missions/marineenvironmentalprotection.asp http://www.epa.gov/lawsregs/topics/water.html#oceans http://dec.alaska.gov/spar/	

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence	
13.4.1	**Alaska 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).** The information supplied above in Clause 13.4 describes the various state and federal agencies who implement regulations that meet or surpass the MARPOL regulations. In many cases, the state and federal regulations implement the MARPOL regulations. Members of the Alaska fishing industry sit on the MARPOL advisory committee. Same Source of Evidence as in 13.4 above.	

Clause:

13.5 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.

Eco 31.3

13.5.1 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 8.4.7 Other 12.11

Evidence adequacy rating:

☑High **☐ Medium** **☐ Low**

Clause:	Evidence	
13.5	**There is knowledge of the essential habitats for the "stock under consideration" and potential fishery impacts on them. Impacts on essential habitats and on habitats that are highly vulnerable to damage by the fishing gear involved are avoided, minimized or mitigated. In assessing fishery impacts, the full spatial range of the relevant habitat is considered.**	

	As previously noted, the MSA is the federal law that governs U.S. marine fisheries management. In 1996 Congress added new habitat conservation provisions to that act in recognition of the importance of fish habitat to productivity and sustainability of U.S. marine fisheries. The Act mandated identification of essential fish habitat (EFH) for managed species. The Act also requires measures to conserve and enhance the habitat needed by fish to carry out their life cycles. The MSA requires cooperation among NOAA Fisheries Service, fishery management councils, fishing participants, federal and state agencies, and others in achieving EFH protection, conservation and enhancement. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The EFH guidelines further interpret the EFH definition as: • Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate • substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities • necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem • and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle. The Council implemented the EFH amendments into its GOA and BSAI FMPs, and defined EFH for pollock and all managed species most recently in 2010. In the Council's final EIS the NEPA analysis fully described the concerns laid out in this Clause. As noted in previous Sections and Clauses, pollock are a pelagic species and aggregate mostly over uniform bottom, this is one of the many reasons that the pelagic net is the preferred gear. Under regulation it is not allowed to use rollers or bobbins that would protect the net on rough bottom. Source of Evidence http://www.fakr.noaa.gov/habitat/seis/efheis.htm	
Evidence adequacy rating: ☑**High** ☐ **Medium** ☐ **Low**		
Clause:	**Evidence**	
13.5.1	**Assessment and scientific evaluation is carried out on the implications of habitat disturbance impact on the fisheries and ecosystems prior to the introduction on a commercial scale of new fishing gear, methods and operations (NEPA process). Accordingly, the effects of such introductions are monitored.** The NPFMC already has fully mature fisheries and, unless a new gear can be found to conform to all existing laws and regulations it is not likely to be considered. Never-the-less, the Council and the industry are always looking at gear modifications, methods or operations that will reduce bycatch or minimize gear impact on the bottom habitat. The Council has a structure of "Test Fisheries" that usually employs a research set	

	aside of quota to test the new equipment, operation or methods. These Test Fishery operations are a full-fledged scientific evaluation, incorporating NMFS, Council staff and industry to develop a plan, which the SSC must sign off on, a reasonable expectation of success and a full monitoring and assessment of the research project on completion. Often the project is more fully vetted through other scientific staff if the proposer seeks additional funds, such as NPRB who uses a very competitive open bid process. If the modification is accepted for commercial use after stringent field testing, the NMFS and the Council will continue to collect data on the operation to see if the expected results appear. The Ecosystem chapter and the various fishing effects described in the BS, AI, GOA and Bogoslof management area SAFE documents is the best understanding of habitat disturbances to date. Because the current ecosystem indicies (i.e. FIB, species richness and Shannon-Wiener diversity index) all indicate fairly stable ecosystems, this may be applied as a form of baseline fishery impact. Because climate induced ecosystem changes tend to swamp current fishery induced impacts, a new assessment would likely need to occur that could better tease out subtle changes. (See Clause 13.1.2 and its Sources of Evidence). Some examples of Test Fish Funded proposals are for halibut and salmon excluders. http://www.iphc.int/sa/bycatch/halexcl.pdf http://www.marineconservationalliance.org/?p=1362 http://www.fakr.noaa.gov/npfmc/bycatch-controls/SalmonBycatch.html http://www.fakr.noaa.gov/npfmc/PDFdocuments/minutes/SSCOCT03.pdf	

Clause:

13.6 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 8.4.8, 7.6.4

Evidence adequacy rating:

☑**High** ☐ **Medium** ☐ **Low**

Clause:	**Evidence**	
13.6	**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.** The Council, the SSC, the AP and the NPRB all annually produce a list of research priorities that focus on timely and important management concerns. This list helps NMFS, NPRB and other research funding agencies focus their tight research funds to resolve topical fishery management issues. In addition, the Council and NPRB seek Individual, community, NGO and fishing industry regulatory or policy proposals and	

	research proposals. This broad group of potential requesters of research or regulatory proposers assures the Council that proposals will include those who are concerned that industrial fisheries such as pollock may cause ecosystem or environmental concerns. Because rural coastal Alaskan communities are often concerned with potential impacts from industrial fisheries, they often go to the Council and BOF with their concern over potential or perceived social impacts. The NEPA assessment analysis, fully described in Clause 13.1.1, will fully evaluate any proposed changes to existing FMP rules and policies as to their impact on biodiversity and coastal fishing communities. The analysis does this because that is how NEPA works (see earlier Clause 13.1.1). But, MSA also assures that any proposed change will evaluate biodiversity and coastal fishing communities because of the EFH requirements of MSA and because National Standard 8 requires the Councils to minimize adverse economic impacts on coastal fishing communities. Additionally, the NPFMC's management objectives require that proposed changes promote sustainable fisheries and communities and increase Alaska Native Consultation. Lastly, as noted in an earlier Clause (8.2) NMFS has developed the Economic and Social Sciences Research Program within their REFM division; it provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. Since coastal community members are important affected stakeholders, the AFSC's Economic and Social Sciences Research (ESSR) Program has been preparing the implementation of the Alaska Community Survey, an annual voluntary data collection program initially focused on Alaska communities for feasibility reasons, in order to improve the socio-economic data available for consideration in North Pacific fisheries management. Please see also Clause 2.5 and 2.6 for further details. Sources of Evidence http://www.nmfs.noaa.gov/sfa/magact http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAI.pdf http://www.afsc.noaa.gov/REFM/Socioeconomics/Default.php	

Section 14 "Where fisheries enhancement is utilized, environmental assessment and monitoring must consider genetic diversity and ecosystem integrity" is not applicable to the AK pollock commercial fishery as it is not an enhanced fishery.

8. External Peer Review

Peer Reviewer A review

Summary and Recommendation

I have thoroughly reviewed the FAO-based responsible fisheries management certification full assessment and certification report. I find it to be a comprehensive, well supported review, and I concur with the assessors' determination and recommendation that the Alaska pollock fisheries from 0-200 miles be certified as sustainable and responsibly managed under FAO criteria. The report clearly and positively supports all FAO-based criteria focusing on responsible fisheries management. All background information on the fishery (species life history, fishery location and method, fishery management, and stock assessment) was very comprehensive and well written. The team competently provided sufficient, pertinent data and references to demonstrate the high level of confidence awarded for conformance of all six major components. All 13 fundamental clauses, and their 122 subclauses were adequately addressed. Only minor edits were suggested, most dealing with spelling or sentence structure issues. With regard to the six major components:

- The fishery management system under state and federal guidance was clearly articulated. The Alaska pollock fishery is one of the world's largest. It is also one of the world's most precisely managed with great attention to science and a transparent regulatory process.
- The science behind the fishery management and stock assessment activities is well founded, peer reviewed and exhaustively documented.
- Sections addressing the precautionary approach are solid and provide more than sufficient examples to complete a high evidence adequacy rating.
- Management measures are clearly addressed for both federal and state-managed fisheries. History of management adoptions is fully explained. Documentation is strong, and thorough.
- Fishery implementation, catch documentation, and enforcement are more than suitably addressed. Clear and concise examples are presented to justify the high evidence confidence rating.
- Ecosystem and fishery impacts are carefully articulated. The narrative comprehensively addresses measures taken to reduce impacts, and how they are positively working and maturing. Sources of evidence are well documented.

Summary of Review from Peer Reviewer A for each of the fundamental clauses 1-13

SECTION	
A	**Fisheries Management System**
1. There must be a structured and legally mandated management system based upon and respecting International, National and local fishery laws and considering other coastal resource users, for the responsible utilization of the stock under consideration and conservation of the marine environment.	
This section is well written, thorough, and the assessment supports the high confidence rating. I suggest a few minor edits as follows: **Page 49 – Clause 1.1: MSA was amended last on January 12, 2007. Please see www.nmfs.noaa.gov/msa2007/details.html** **Page 51 – Clause 1.2: add the word "Section of the Bering Sea", or equivalent, to the first sentence following the word "Eastern" to describe where in the North Pacific the largest concentration is located.** **Page 63 – Clause 1.5: modify the second sentence to read "Both states routinely allow scientists from the other country onboard research vessels."** **Page 69 – Clause 1.8: Regarding the last sentence, I believe the Open Meetings Act dictates that "No more than three Board or FIVE council members can meet together unless the meeting is an open public meeting". Note that there are seven voting Alaska Board of Fisheries members, and 11 voting North Pacific Fishery Management Council members.** Assessment Team Response. The proposed changes have been made accordingly.	
2. Management organizations must participate in coastal area management related institutional frameworks, decision-making processes and activities relevant to the fishery resource and its users in support of sustainable and integrated use of living marine resources and the avoidance of conflict among users.	
This section is well written, thorough, and the assessment supports the high confidence rating. I suggest a few minor edits as follows: **Page 71 – Clause 2.1: With regard to the National Environmental Policy Act (NEPA), I suggest the assessment would benefit from a few sentences introducing and describing the Act – see http://en.wikipedia.org/wiki/National_Environmental_Policy_Act or http://www.epa.gov/region1/nepa/** **Page 76 – Clause 2.3: The last sentence is not entirely correct. NEPA is a federal act imposed on "federal activities". The Alaska Board of Fisheries is not legally bound to any requirements of the Act. However, state-managed pollock fisheries are bound by existing state regulations within the Alaska Aministrative Code Chapter 28-Groundfish Fishery. Within it (http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.commercial) are provisions and requirements that mirror many objectives found in NEPA. Specifically see 5 AAC 28.089 Guiding Principles for Groundfish Fishery Regulations. (This point not accepted as 28.089 does not entail regulation for PWS).** **Page 77 – Clause 2.4: In the second sentence, replace "legislation" with "regulation". Congress and the Alaska Legislature are responsible for legislation. The Secretary of Commerce and the Lieutenant Governor of Alaska sign NPFMC and BOF decisions into regulation (law).** **Page 77 – Clause 2.4.1: In addition to local radio, the internet (NMFS and ADFG websites),**	

and printed news releases and Emergency Orders (available at local harbourmaster's offices, marine supply outlets, etc) also provide examples.
Page 80 – Clause 2.6: Insert the word "learning" after the word "higher" found in the first sentence.
Page 84 – Clause 2.7: In addition to oil spills, other "cargo" being transported through the area may have significant environmental risks. As an example, the grounding and subsequent break up of the 738 foot freighter *Selendang Ayu* resulted in not only a significant loss of life, but oil and soybean spills (http://www.dec.state.ak.us/spar/perp/response/sum_fy05/041207201/041207201_index.htm). Other environmental impacts may result from untreated ballast water discharge (introduction Aquatic Nuisance Species http://www.pwsrcac.org/projects/nis/studies.html), rats (on some Aluetian Islands, unchecked predation on birds, see http://www.stoprats.org/wildlife.htm and http://www.pnas.org/content/105/10/3800.long) or other hazardous cargo (http://www.dec.state.ak.us/spar/perp/docs/hmrt_feb05.pdf).
Page 85 – Clause 2.8: Remove reference to state agencies tasked with NEPA requirements (see 2.1, 2.3 clarifications).
Page 85 – Clause 2.9: Same as Clause 2.8.

Assessment Team Response. The proposed changes have been made accordingly (apart from exception in red).

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

This section is well written, thorough, and the assessment supports the high confidence rating.

B	**Science and Stock Assessment Activities**

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

This section is well written, thorough, and the assessment supports the high confidence rating. I suggest a few minor edits as follows:
Page 111 – Clause 4.1.2: It could be noted (as it is in Clause 4.2) that Motherships and Catcher/Processors now have 200% observer coverage, please see http://alaskafisheries.noaa.gov/frules/afa_er2.pdf or http://www.fakr.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/ObserverRegs1011.pdf

Assessment Team Response. The proposed changes have been made accordingly.

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

This section is well written, thorough, and the assessment supports the high confidence rating.

C	The Precautionary Approach

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

This section is well written, thorough, and the assessment supports the high confidence rating.

7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient, a suitable method using risk assessment must be adopted to take into account uncertainty.

This section is well written, thorough, and the assessment supports the high confidence rating.

D	Management Measures

8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery, and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

This section is well written, thorough, and the assessment supports the high confidence rating. I suggest a few minor edits as follows:

Page 155 – Clause 8.1.1: third paragraph, fourth sentence, change "restricts" to "restrictions".

Page 156 – Clause 8.2: third paragraph, third sentence, change to read "Fishery allocations led to the wasteful fishing practice of roe stripping by the offshore fleet, producing ecosystem concerns created by the large volume of carcasses discarded at sea."

Page 156 – Clause 8.2: Third paragraph, fourth sentence, change to read "Harvests were occuring faster and faster each year, creating a race for fish by a growing pollock fleet. With compressed seasons there was a greater potential to exceed the TAC, thereby increasing the likelihood of reduced spawning activity."

Assessment Team Response. The proposed changes have been made accordingly.

9. There must be defined management measures, designed to maintain stocks at levels capable of producing maximum sustainable levels.

This section is well written, thorough, and the assessment supports the high confidence rating.

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

This section is well written, thorough, and the assessment supports the high confidence rating.

E	Implementation, Monitoring and Control

11. An effective legal and administrative framework must be established and compliance ensured, through effective mechanisms for monitoring, surveillance, control and enforcement for all

fishing activities within the jurisdiction.	
This section is well written, thorough, and the assessment supports the high confidence rating.	
12. There must be a framework for sanctions for violations and illegal activities of adequate severity to support compliance and discourage violations.	
This section is well written, thorough, and the assessment supports the high confidence rating.	
F	**Serious Impacts of the Fishery on the Ecosystem**
13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.	
This section is well written, thorough, and the assessment supports the high confidence rating. I suggest a few minor edits as follows: **Page 203 – Clause 13.2: Second paragraph, change the word "error" to "err" and replace the "." with a "," in the sentence "… must ERR on the side of precaution, NMFS implemented…** **Page 204 – Clause 13.2: top of the page, delete the words "to the existence of".** **Page 210 – Clause 13.5.1: last sentence, change "induces" to "induced".** Assessment Team Response. The proposed changes have been made accordingly.	

Peer Reviewer B review

Summary and Recommendation

The overall impression is that of a well managed major fishery with sound fishing practices, and with stocks in a good shape. The documentation supporting the evaluation clauses is extensive and the conclusions are generally well justified.

I have made comments to some of the clauses. The essence of my comments can be summarized in the following points:

- Stock identity and migration patterns. This relates both to ensuring that individual stock components are not over-exploited and to international relations.
- The process leading to a final TAC is complex, and criteria used in some of the steps are not clearly outlined.
- Lack (apparently) of performance testing of the current harvest rule with implications for the handling of uncertain assessments and for the ability to obtain a long term yield close to the maximum.
- Ability to adapt the management to changing environment, given that regime shifts are recognized as a potential problem in this area.

Comments on the general part (Section 3)

This section has been reviewed mostly as an informative overview rather than as a review of the evidence for the clauses. It covers the relevant ground, with a good deal scientific detail, which is appreciated, but sometimes lacks the broad overview that would be useful for someone who is not familiar with the area and with US fisheries management.

Some points that would improve this section:

There could be a more comprehensive overview of stock structure and management units that can be used as reference elsewhere. That may include a discussion of stock separation, and of consistency between management units and biological sub-stocks.

More extensive use of maps would be useful, showing e.g. fishing grounds, spawning areas, migration routes, management areas etc., preferably in a consistent lay-out to facilitate the understanding of the links between e.g. stock distributions, management areas and fishing practices. Such maps should also have names of places and areas that are referred to in the text. That would help to understand stock structure, management and fishery.

The information about cannibalism is slightly confusing. Apparently, small (<40 cm) pollock feeds on euphausiids and other crustaceans, while adult pollock in the Bering Sea have 44% young pollock in their stomachs. One would like to know if cannibalism is strong enough to create negative feedback in the population dynamics.

The list of acronyms is very useful but not quite complete - there are still a few more in the text. Ideally, it could be made even more useful by including a few explanatory sentences to acronyms relating to concepts and standards, and perhaps even a cross reference.

Assessment Team Response. Additions and clarifications have been made accordingly to the introductory Section 3.

Summary of review from Peer Reviewer B for each of the fundamental clauses 1-13.

SECTION	
A	**Fisheries Management System**

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

Insert comments here.

1.2 A comprehensive overview of the geographical distribution of the stocks, management units and fishery would be useful. One important aspect of this is to demonstrate that assessing the state of pollock stocks in US waters alone is adequate, the other is whether the US management covers the whole stocks (at least for practical purposes) and the third is whether the instruments for international management are adequate. Apparently, these are minor problems, and if so, it would be good to have it clearly stated.

Assessment Team Response. Clarifications have been made in Clause 1.2 and additional explanatory figures have been provided in the introductory Section 3 of the report.

1.4 Are there indications of fishery in the International zone, despite the moratorium? There was a mention of IUU fishing in 11.3, is this an exceptional event or a common problem?

Assessment Team Response. The Donut Hole convention area is closed to pollock fishing since 1993 and is patrolled by the U.S. and Russian Coast Guard. There is no indication of pollock fishing despite the moratorium. The illegal driftnet fishing activities of the Bangun Perkasa's mentioned in 11.3 appear to be the exception than the rule. According to the US Coast guard reports to the NPFMC available at http://www.alaskafisheries.noaa.gov/npfmc/resources-publications/summary-reports.html there were 27 suspected IUU sightings in 2009 and 17 in 2010.

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

Insert comments here.
No comments.

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

Insert comments here.
In place, but see pts. 5 and 6.

Assessment Team response. None needed.

B	Science and Stock Assessment Activities

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

Insert comments here.

In place, but survey results have year-to-year inconsistencies that carry over to the assessments. The system for collecting fisheries data and samples, including the observer program looks convincing.

Assessment Team response. None needed.

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

Insert comments here.

There are regular stock assessments of very high standard. Nevertheless, there are sometimes quite strong year-to-year inconsistencies in the assessments. It is not quite clear whether the harvest rule and the tier system is sufficient to cope with the problem.

Assessment Team Response. The ability of assessment authors and Plan Teams to recommend departures from the prescriptive ABC rule in cases where annual assessment results are considerably different than those of previous years, and where the strict application of the ABC rule may result in harm to the stock in question due to uncertainties in the assessment results, is an additional conservation benefit to the management regime. In doing so, the Plan Teams must provide scientific justifications for such departures. This was done in both the EBS and GOA assessments in 2010. However, the current approach is *ad hoc* and it may be beneficial to further investigate modifying the decision rules to explicitly allow for such considerations.

C	The Precautionary Approach

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

Insert comments here.

1. The guideline for setting reference points is the MSY. The reference points are not static, rather, the guideline is the current perception of the B_{MSY} and the associated F_{MSY}. This way, the management can adapt to changes in productivity, but these values are also sensitive to assessment errors, in particular in the estimate of the stock-recruitment relationship. If the stock assessment uncertainty is clearly estimated (tier 1) the limit biomass is at B_{MSY}, and if uncertainty is less clear (tier 3) it is set at $B_{40\%}$, which is considered a conservative proxy for B_{MSY}. The final TAC is set below the catch corresponding to the MSY reference points to account for uncertainty both in assessment and implementation, in a stepwise procedure. Apparently there is opportunities for some judgment underway (cfr. Section on ABC Recommendation in the NPFMC Bering Sea and Aleutian Islands SAFE report 2010), which may be useful, but it is a weakness of a plan if this is necessary to end up with a sound advice.

Assessment Team Response. Rather than a weakness, relative judgment opportunities can be seen as an advantage if restrictions are made for conservation reasons. In the 2010 EBS pollock assessment there were a number of concerns that justified precaution in setting the ABC below the maximum permissible. Given these concerns, an added control rule adjustment in harvest rates seems justified to ensure that fishing mortality increases at a more incremental pace. There have been cases in the US where the ABC rule was followed by the letter and this resulted in a situation where the scientific advice was clearly inappropriate. The provisions in the FMPs allow assessment authors and Plan Teams to use scientific reasons for departing from the ABC decision rules, as outlined in clauses 6.1.2 and section 7.2.3, is an advantage for conservation reasons.

2. As far as I can see, the harvest rules that apply have not been formally tested by simulations. Rather, they appear to be designed and turned into legislation according to principles that are generally assumed to be sound, but without further evaluation of their performance. The experience is that the rules have worked well – the major stocks are in a good shape, but unless there are more formal evaluations that have not been brought forward in the present assessment, the justification for the reference points and the robustness of the rule should be made clearer.

Assessment Team Response. The NPFMC commissioned an independent scientific review of their harvest strategy for the BSAI and GOA groundfish fisheries, with particular attention to the role played by the *F40%* reference point, and to determine whether changes should be made to be in accordance with the National Standards of the MSA (Goodman et al. 2002). The panel concluded that the proxy reference points are defensible and that the specific values used are supported by a body of scientific literature as being reasonable proxies for "typical groundfish" species like Alaska pollock (see Clark 1991). They also concluded that the management system contained in the groundfish FMPs is generally consistent with the single-species/target-stock components of the MSA. They also recommended that the robustness of the management system be tested through simulations in an approach commonly referred to as a management strategy evaluation (MSE). The review panel acknowledged that this is a time-consuming and technically difficult undertaking requiring a significant commitment of scientific resources. A similar recommendation was made in the 2009 CIE review of the EBS pollock stock assessment. The analysis has not yet been undertaken.

References.

Clark, W.G. 1991. Groundfish exploitation rates based on life history parameters. Can. J. Fish. Aquat. Sci 48: 734-750.

Goodman, D. et al. 2002. Scientific review of the harvest strategy currently used in the BSAI and GOA groundfish management plans. Prepared for the NPFMC November 21, 2002.

Restrepo, V. (ed.) 1999. Proceedings of the fifth national NMFS Stock Assessment Workshop: Providing scientific advice to implement the precautionary approach under the Magnuson-Stevens Fishery Conservation and Management Act. Noaa Tech. Memo. NMFS-F/SPO-40.

3. The ecosystem in the Bering Sea is not stable, and regime shifts in the environment have been described (PICES Scientific Report No. 28, 2005). There is work reported on how to adapt reference points to regime shifts (e.g. Ianelli et al, ICES Journal of Marine Science, 68: 1297–1304), but it is not clear whether the current management framework is capable of responding to such insight.

NPFMC management of the groundfish stocks in Alaska, as directed by the MSA, has inbuilt mechanisms to deal appropriately and effectively with the dynamic nature of groundfish stocks abundance. Assessment authors and Plan Teams, who are scientific experts on the individual stocks, have the ability to recommend departures from the prescriptive ABC decision rules when ecological/conservation conditions warrant. In doing so, they must provide adequate scientific justification for their recommendations.

7. Management actions and measures for the conservation of stock and the aquatic environment must be based on the Precautionary Approach. Where information is deficient, a suitable method using risk assessment must be adopted to take into account uncertainty.

Insert comments here.

The key remedy to handle assessment uncertainty appears to be the tier system and the distance between TAC and OFL catch, see comments under Clauses 5 and 6. Risk assessment appears through estimates of variance in the assessments. There are examples where last years assessment is outside the confidence range of the present assessment (Fig. 1.36 in the NPFMC Bering Sea and Aleutian Islands SAFE report 2010), and quite severe retrospective inconsistencies appear in the assessment (*idem*, Fig. 1.37)

Assessment Team Response. The same responses as provided in the previous section apply. Clauses 6.1.2 and 7.2.3 explain these points in detail. The retrospective inconsistencies that appear in the assessment have been taken into account by decreasing allowable catch rates from the ABC value as calculated from the harvest control rule. In the EBS assessment retrospective inconsistencies are one clear reason why harvest rate have been proposed way more conservatively than allowed for. In fact EBS pollock in 2011 had a Max ABC of 2,154,000 t but the recommended ABC was of 1,267,000 t.

D	Management Measures

8. Management must adopt and implement effective measures including; harvest control rules and technical measures applicable to sustainable utilization of the fishery, and based upon verifiable evidence and advice from available scientific and objective, traditional sources.

Insert comments here.

1. The Alaskan pollock is described as a complex of several sub-stocks (cfr. 1.2), but is managed as two stocks – the EBS stock and the GOA stock. The EBS stock has separate measures for the Aleutian component. The instruments to ensure that the complex is exploited in a balanced way, i.e. that effort is not unduly concentrated on one component should be clearly documented. There is a separate TAC set for the Aleutian area, but it is not clear how that TAC is derived and it is not taken. There are some regional restrictions, but they seem to be mostly motivated by the (clearly important) concern for other species (Sea lions in particular).

Assessment Team Response. In June 2004, the Council took final action on amendments to the BSAI Groundfish FMP, and regulatory amendments, to make it possible to make future allocations of AI pollock to the Aleut Corporation. These amendments were necessary to implement requirements in the 2004 Consolidated Appropriations Act requiring that future allocations for directed pollock fishing in the AI be made to the Aleut Corporation for the purpose of the economic development of the community of Adak. The Council's action created an AI pollock TAC of 19,000 mt if the ABC were equal to or greater than 19,000 mt, and a TAC less than or equal to the ABC if the ABC were less than 19,000 mt.

The TAC is to provide for an Aleut Corporation directed pollock fishery, and for an incidental catch allowance (ICA) of pollock for other target fisheries that take pollock incidentally in their operations. The fishery was still restricted to areas outside of 20 nmi of Steller Sea lion rookeries and haulouts, limiting fishing to two small areas with commercial concentrations of pollock within easy delivery distance to Adak Island. Bycatch of Pacific Ocean perch (POP) can be very high in both these areas and it appears that pollock and POP share these areas intermittently; depending on time of day, season, and tide. Although there may be other areas further west that may have commercial concentrations of pollock, to date there have been no attempts by the reopened directed fishery to explore these areas.The Aleutian Islands pollock catch in the last 6 years has averaged less than 10% the TAC.

2. The harvest rule leads to an acceptable biological catch (ABC). The TAC is sometimes set well below the ABC. The criteria for setting the final TAC are not clearly stated (see also comments to Clause 6). Apparently, the TAC cannot be set above the ABC, but setting it lower may be an important contribution to the performance of the management vs. the precautionary approach. In simple terms – has the harvest rule worked well because sound exceptions from the rule have been made?

Assessment Team Response. The current system seems to work well, it has been accepted by the Council and the public at large, and the EBS and GOA stocks are not being overfished or are in overfished conditions. The objective is not to get to MSY, but rather to maintain the stock in a condition that could give MSY. Figures tracking management performance are provided in clause 6.1.3.

9. There must be defined management measures, designed to maintain stocks at levels capable of producing maximum sustainable levels.

Insert comments here.

That is the ambition, but see pt. 6 and 8. Even though the MSY is the overall guideline, there is no quantitative evidence presented that the long term yield will be close to the maximum.

Assessment Team Response. The long term yield will be as close as possible to the maximum, but within precautionary levels given due uncertainties, ecosystem and conservation considerations. The harvest control rule is designed to treat MSY as a limit rather than a target and the allowed TAC is usually equal or less than ABC. This system strives to keep stocks at or above MSY levels. When stocks decrease below reference points, catch rates are decreased in an effort to return the stocks to proper levels.

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

Insert comments here. No comments.

E	Implementation, Monitoring and Control

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

Insert comments here.

The framework is extensive and looks convincing.

Assessment Team response. None needed.

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

Insert comments here.

Seems to be in place, but some indications of its efficiency could be valuable.

Assessment Team Response. Presentations of the USCG to the Council regarding fisheries enforcement regulation activities are done quarterly and at the end of the year (these are available at http://www.alaskafisheries.noaa.gov/npfmc/resources-publications/summary-reports.html).

Fishing vessel violations for 2008-2010 were:

2008	2009	2010
2 Prohibited Species Retention. 3 Failure to Retain Bycatch. 1 Quota Overage. 1 VMS Inoperative. 1 Insufficient Observer Coverage. 2 License/License Holder Not On Board. 21 Failure to Maintain Logbooks.	2 Operating Inside No-Transit Zone. 3 Fishing in Closed Areas. 2 VMS Inoperative. 2 Insufficient Observer Coverage. 3 License/License Holder Not On Board. 15 Failure to Maintain Logbooks. 8 Insufficient Boarding Ladder.	11 Logbook. 08 Boarding Ladder. 05 Gear. 13 Catch. 10 Permit. 02 Observer Coverage. 11 Closed Area. 01 VMS.

F	Serious Impacts of the Fishery on the Ecosystem

13. Considerations of fishery interactions and effects on the ecosystem must 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 must be appropriately assessed and effectively addressed.

Insert comments here.

There clearly are measures in place to protect vulnerable species, in particular Sea lions. Likewise, the fact that only pelagic gear is used reduces the risk of destroying habitats for others. There are rules for avoiding discards and extensive observer programs. Apparently, the discards are small in practice. Also, the former roe fishery is not permitted any more.

Assessment Team response. None needed.

9. Non-Conformances and Corrective Actions

Non conformances are categorized as minor, major and critical non conformances. Where the Assessment Team concludes that the available evidence does not meet the 'high' confidence rating for a specific clause of the Conformance Criteria, and on further clarification with fishery management organizations, the outcome remains unchanged; a non conformance may be raised against that particular clause.

Based on the high quality of information and reports available and through the course of consultation and witnessing the various management processes, the assessment team was highly confident of the responsible fisheries management that is demonstrated by the Alaska pollock commercial fishery in accordance with the FAO-Based RFM conformance criteria.

10. Recommendation and Determination

The Assessment Team recommend that the management system of the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

Certification Committee Determination

The appointed members of the Global Trust Certification Committee met on the 6th December 2011. After detailed discussion, the Certification Committee determined that the applicant fishery, the US Alaska pollock commercial fishery, under federal (NMFS/NPFMC) and state (ADFG/BOF) management, fished by the directed fishery with pelagic trawl gear [and other gear types (bottom trawl, jig, longline, pot) that can legally land by-caught pollock] within Alaska's 200 nm EEZ, is certified against the FAO-Based Responsible Fisheries Management Certification Program.

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Appendix 1

Alaska Pollock Assessors

Based on the Technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd. confirmed the Assessment Team members for this fishery as follows.

Earl Krygier

Earl E. Krygier gained a BSc in Science, an MSc from the Department of Fisheries and Wildlife, and completed a Ph.D Doctoral Thesis (on the role of nursery areas for juvenile English sole off Oregon) at the Oregon State University. From 1989 to 2008 he worked for ADFG's Commercial Fisheries Division as Extended Jurisdiction Program Manager with primary responsibility on state policy coordination of state, national and international marine fishery matters (research, conservation and management, and policy development), provided support for ADFG's Commissioner in carrying out his NPFMC's responsibilities and acting as the Commissioner's alternate (1989-1997). Earl represented ADFG at the IPHC for 19 years, and he was state representative at the Donut Hole and the U.S./Russian ICC meetings. He sat as alternate for the Commissioner on the North Pacific Research Board (NPRB); represented ADFG on Alaska's CDQ Allocation Team; advised department staff, the Alaska BoF members, the Alaska Legislature and other state officials on NPFMC activities; and proposed management plans, long-range policies and regulatory implications, or inter-jurisdictional issues arising from Council actions. He coordinated ADFG's staff activities at the NPFMC and recommended policies and strategies to the director, commissioner and other state officials in regards to extended jurisdictional fisheries. Earl coordinated the State's conservation and management policy for halibut at the NPFMC, the PFMC and the IPHC, that resulted in proper halibut bycatch management; stock utilization; equitable Alaska subsistence, sport and commercial harvests; helping ensure that development of CDQs and IFQ was done in accordance with conservation & management objectives, fairly and equitably for user groups. From 2008 to present times he is the Owner/Manager of KEE Biological Consultants and served as the Marine Conservation Alliance Foundation's (MCAF) Cooperative Research Coordinator, implementing MCAF's marine research activities in Alaska in cooperation with state or federal agencies, academia, the seafood industry and other interested parties.

Alan Sinclair

Alan Sinclair recently retired from a fisheries research career with Fisheries and Oceans Canada. His research included stock assessment methods and application with a recent emphasis on management strategy evaluation through feedback loop simulation and the application of the Precautionary Approach in achieving sustainable fisheries. He studied changes in fish population demographic characteristics including growth, juvenile survival, and adult natural mortality and the implications of these changes on productivity and management reference points. He investigated geologic and oceanographic factors influencing the spatial distribution of fish species, and the influence of environmental factors on recruitment. He worked with a number of national and international fisheries organizations including the Pacific Scientific Advice Review Committee (PSARC) chair of Groundfish Subcommittee; Canadian Atlantic Fisheries Advisory Committee (CAFSAC) chaired the Groundfish Subcommittee, the Statistics Sampling and Surveys Subcommittee; NAFO stock assessments and symposia; ICES annual science conferences, symposia and working groups; PICES annual science conference. He participated in fishery stock assessment meetings as reviewer and presenter in PSARC, CAFSAC, NAFO, ICES, and US National Marine Fisheries Service (NMFS) Stock Assessment Review (STAR) Panels. Alan Sinclair is currently a member of the

Committee on the Status of Endangered Wildlife in Canada (COSEWIC) where he is the co-chair of the Marine Fishes Species Specialist Subcommittee.

Stephen Grabacki (Assessor)

Stephen Grabacki, FP-C, holds a Master of Science degree in Fisheries Biology from University of Alaska Fairbanks. He is a Certified Fisheries Professional, in the American Fisheries Society. Steve has 32 years of experience in Alaska's fisheries. He is President of GRAYSTAR Pacific Seafood, Ltd., a consulting company which provides technical services in fisheries biology, fishery management, and seafood quality. As Adjunct Professor at University of Alaska Anchorage, Steve has taught courses in Fisheries Management and Seafood Logistics. He serves on the Board of Directors of the Alaska SeaLife Center, and is a member of the Export Council of Alaska.

Vito Ciccia Romito (Assessor and Information Manager)

Vito holds a BSc in Ecology and an MSc in Tropical Coastal Management (Newcastle University, United Kingdom). His BSc studies focused on bycatch, discards, benthic impact of commercial fishing gear and relative technical solutions, after which he spent a year in Tanzania as a Marine Research officer at Mafia Island Marine Park carrying out biodiversity assessments and monitoring studies of coral reef, mangrove and seagrass ecosystems. Subsequently, for his MSc, he focused on fisheries assessment techniques, ecological dynamics of overexploited tropical marine ecosystems, and evaluation of low trophic aquaculture as a support to artisanal reef fisheries. Since 2010, he has been fully involved through Global Trust with the FAO-based RFM Assessment and Certification program covering the Alaska salmon, halibut, sablefish and pollock fisheries.

Dave Garforth (Lead Assessor)

Dave Garforth, BSC, HDip. (Applied Science), MSC has been involved in fisheries and aquatic resources for over 20 years. Currently, managing Global Trust FAO based Fishery Certification Program, with experience in the application of ISO/IEC Guide 65 based seafood certification systems and a professional background in numerous fishery assessments. Previous professional background includes; Development Officer in the Irish Sea Fisheries Board, supply chain and trade experience at Pan European Fish Auctions, the control and enforcement of fisheries regulations as a UK Fishery Officer. Dave is also a lead, third party IRCA approved auditor.

Appendix 2

Based on the Technical expertise required to carry out the above fishery assessment, Global Trust Certification Ltd. confirmed the External Peer Reviewers members for this fishery as follows.

Herman Savikko

Mr. Savikko worked for the ADFG in fishery management and research positions for 30 years. For the last 9 years of his career, he was the State/Federal Marine Fisheries Coordinator, responsible for coordinating the bio-technical information between the department, the public, the NMFS, the NPFMC and the Alaska BOF. Mr. Savikko was the lead Fishery Biologist on the State's advance team providing the Commissioner of ADFG, a voting NPFMC member, with detailed data on issues and assisted in department policy-making decisions over FMP fisheries. In that role, the team developed policy approaches to improve management and resource sustainability through the implementation of various catch share programs, establishing critical habitat, better data collection and reporting methods, and enhanced enforcement. Scope of projects involving the pollock fisheries off Alaska included the refining of Community Development Quotas Program; resolving issues and actions associated with the listing of Stellar Sea Lions under the federal Endangered Species Act and resulting conflicts with affected commercial fisheries; contribution with the development of the BSAI Chinook Salmon Bycatch EIS, capping the number of Chinook salmon caught incidentally in the Bering Sea/Aleutian Islands pollock fisheries with incentive plan agreements and performance standards; establishment of protected waters under a provision to describe and identify essential fish habitat for FMP fisheries; changes to the fishery observer programs, both in review of electronic and onboard biological staff attributes; establishment of an Arctic Fishery Management Plan addressing apparent climate change trends; and State regulatory procedure for 0-3 mile pollock fisheries, handled through active participation in the Alaska Board of Fisheries process.

Dankert Skagen

Dankert Skagen has recently retired from the Institute of Marine Research (IMR), Bergen, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and recently, on development of harvest control rules and management strategies. He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and been chairman of several of them, including the Study Group of Management Strategies. He was chairman of the Resource Management Committee for 3 years and member of ACFM for 7 years.

Appendix 3

Certification Summary
Alaska Pollock Commercial Fishery Certification

Certification Recommendation

Date: 9th December 2011

A positive Certification determination has been awarded for the *fishery management of the U.S. Alaska pollock commercial fisheries,* against the FAO-based Responsible Fisheries Management (RFM) Conformance Criteria[1] . Certification determination was given by a Global Trust Certification Committee on December 6th 2011, after a nine months independent assessment of the Alaska pollock commercial fishery. The assessment was performed at the request of the Alaska Seafood Marketing Institute (ASMI).

The Certification covers the fishery management of the Alaska pollock (*Theragra chalcogramma*) commercial fishery, employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) 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.

A Global Trust Certification Committee, composed of fishery, certification and accreditation experts, was tasked with a qualitative review of the formal processes, assessment reports and recommendations provided by the fishery Assessment Team and Peer Reviewers appointed to assess this fishery. The Certification Committee unanimously agreed with the Assessment Team's findings that the applicant Alaska pollock commercial fishery is responsibly managed by effective management organizations, using robust fishery management plans and practices based on objective science and information.

The resulting certification communication for the Alaska pollock commercial fishery is: *'Certified Responsible Fisheries Management'*.

This Certification delivers high confidence that reliable management systems are in place to properly assess and respond to any current and evolving issues and allow the fishery to continue on the path of responsible management. These management systems are certified as being in line with those recommended by the FAO Code of Conduct for Responsible Fisheries (1995) and FAO Guidelines for

[1] GTC version 1.2 (Sept 2011), as derived by the United Nations Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries (1995), the FAO Guidelines for the Eco-Labeling of Fish and Fishery Products from Marine Capture Fisheries (2005) as amended/extended in 2009, and the FAO Fisheries Circular No. 917 by John. F. Caddy (1996).

the Eco-Labeling of Fish and Fishery Products from Marine Capture Fisheries (2005) and amended/extended in 2009.

This Certification demonstrates responsible management for the sustainable use of the fisheries and is a realistic and tangible communication for this standard and process. The Global Trust Certification lasts for five years and it involves annual surveillance assessments of the fishery. This Certification means that the Alaska pollock commercial fishery has met the criteria for certification of responsibly managed fisheries at the point in time of the assessment. The reason there are annual surveillance assessments and a full re-assessment every 5 years is to verify fishery management continues to perform responsibly.

The Alaska pollock commercial fishery achieved high conformity against all clauses of the FAO-Based RFM Conformance Criteria. The separate peer review evaluations also supported a positive decision for certification. A vast amount of information has been collated and recorded regarding the applicant fishery, all of which were considered in the assessment. The assessment findings have been documented in a 250 page Full Assessment and Certification Report.

The assessment process has layers of governance and transparency. The assessment was conducted by Global Trust Certification according to the International Standards Organization (ISO) Guide 65:1996 procedures for FAO-based Responsible Fisheries Management Certification. ISO Guide 65 is the international accreditation criteria for bodies offering product and process certification. The ISO Guide 65 assessment, certification and decision process is governed by the accreditation bodies of the International Accreditation Forum (IAF). Global Trust Certification is accredited by the Irish National Accreditation Board (INAB) who is a member of the IAF.

The Full Assessment and Certification Report will be made available for download on request at Global Trust and ASMI's websites before the 31st January 2012:

www.GTCERT.com and http://sustainability.alaskaseafood.org/pollock-certification

Summary of the Process

ASMI, on behalf of Alaska pollock commercial fishery, submitted an application to Global Trust Certification for a formal assessment of the Alaska pollock commercial fishery to the requirements of the FAO-Based Responsible Fisheries Management (RFM) Certification Program. The Application was received in April 2010 (Table 1).

After an initial Validation Assessment (Table 2) was completed by Global Trust in April 2011, an expert Assessment Team was formed to undertake the full assessment. The Assessment Team was composed of independent assessors (Table 3) with expert competency in fishery science, the Alaska pollock fishery, the Alaska management system, the FAO-based RFM Conformance Criteria and the Certification process.

The Assessment Team's report was peer-reviewed by two additional independent experts (Table 4) before being submitted to a formal Global Trust Certification Committee (Table 5) for an independent certification decision.

Key factors and issues evaluated, documented and judged by the Assessment Team included:

A. The Fisheries Management System

The primary layer of governance for the federal Alaska pollock fisheries is dictated by the Magnuson Stevens Act (MSA). The main federal agencies involved in pollock management within Alaska's EEZ (NMFS, NPFMC), and all of their activities and decisions, are subject to the MSA. The MSA sets out ten national standards for fishery conservation and management (16 U.S.C. § 1851), with which all Fishery Management Plan (FMP) must be consistent. The Gulf of Alaska (GOA) Groundfish FMP and the Bering Sea and Aleutian Islands (BSAI) Groundfish FMP govern the management of the federal pollock fisheries. The Council submit their recommendations and plans to the NMFS for review, approval, and implementation. In addition, NMFS Alaska Regional Office conducts biological studies, stock survey and stock assessment reports. The USCG is responsible for enforcing these FMPs at sea, in conjunction with NMFS enforcement ashore. In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF. Biomass is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys in winter. In 1999 the BOF directed the ADFG to establish a PWS pollock trawl fishery management plan to reduce potential impacts on the endangered population of Steller sea lions (SSL) by geographically apportioning the catch. Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. The effort in the patrol and enforcement of state waters regulations is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT).

In 1998, Congress enacted the American Fisheries Act (AFA) to rationalize the BSAI pollock fishery by limiting participation and allocating specific percentages of the Bering Sea directed pollock fishery TAC among the competing sectors of the fishery. After first deducting 10 percent of the TAC for the Community Development Quota (CDQ) Program and an incidental catch allowance, the AFA allocates 50 percent of the remaining TAC to the inshore catcher vessels sector; 40 percent to the catcher processor sector; and 10 percent to the mothership sector. In the GOA, in 1996, a moratorium on entry of new vessels into the groundfish fishery was implemented. In June 1995, the Council adopted a license limitation program (LLP) to supersede the vessel moratorium. As of January 1, 2000 a Federal LLP license is required for vessels participating in directed fishing for LLP groundfish species in the GOA or BSAI, or fishing in any BSAI LLP crab fisheries.

In the U.S. portion of the Bering Sea three stocks of pollock are identified for management purposes and are managed within the framework of the BSAI Groundfish FMP. These are: pollock occurring on the Eastern Bering Sea shelf; the Aleutian Islands Region and the Central Bering Sea Bogoslof Island pollock. Pollock in the Gulf of Alaska, specifically, the spawning aggregations in PWS, the Shelikof Strait and the Shumagin Islands are managed within the framework of the GOA Groundfish FMP. 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. These meetings have resulted in US vessels doing acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea, where a small portion of U.S. pollock moves into. 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. All fishery removals and mortality of the target stock(s) are considered by management. For both the BSAI and the GOA pollock stocks (see EBS and GOA pollock Stock Assessment and Fishery Evaluation (SAFE) reports), the management organizations collect the necessary information on removals and mortality (including natural mortality) of the target stock, as well as data on bycatch and discards. Strictly enforced landing reports, at sea and shore-based fishery enforcement, fishery observers and an extensive mandatory and voluntary logbook program verify and ground-truth total mortality estimates.

The NMFS and the NPFMC participates 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. Each NPFMC fisheries package (amendments and developments) must go through the NEPA process. The NPFMC and BOF meetings provide forums for resolution of potential fisheries conflicts. In addition, stakeholders may review and submit written comments to the NMFS on proposed rules published in the Federal Register. NPFMC's management arrangements and decision making processes for the fishery are organized in a very transparent manner. The Council (and NMFS) as well as the BOF (and ADFG) provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The Council and the BOF actively encourages stakeholder participation, and all Council and BOF deliberations are conducted in open, public sessions. The primary job of the NPFMC and the BOF is allocation of resources to different users. To do so, they use biological and socio-economic information collected and analyzed by the NMFS and the ADFG. The NPFMC, NMFS and ADFG all have staff economists that participate in the economic, social and cultural evaluation and review process of fishery management proposals. On a higher level, the NEPA process has similar requirements - the biological and socio-economic aspects of the fishery must be taken into account before any decision can occur. The coastal zone is monitored as part of the coastal management process using physical, chemical, biological, economic and social parameters. Involvement includes a wide variety of federal and state agencies and programs.

B. Science and Stock Assessment Activities

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. EBS pollock landings have been recorded by a combination of ADFG fish tickets and more recently the electronic eLandings system. Landings are verified by shorebased observers. Estimates of discards are compiled from fishing logbooks and at-sea observer data. The age composition of the catches has been estimated annually from 1979 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions. In the EBS two fishery-independent research surveys have been used to estimate trends in the population abundance, size and age composition. A bottom trawl survey has been conducted in the EBS annually since 1979. This survey gives an estimate of the near-bottom component of the population defined by the fraction of the population within the depth range sampled by the bottom trawl. An acoustic-Trawl (AT) survey has also been conducted to estimate the off-bottom component of the population. The frequency of the survey has increased over the period 1979-2010 from initially every 3 years to annually in recent years.

GOA catch is currently estimated by the NMFS regional office from landings records and observer estimates of discards. Catch estimates include the state managed fishery in PWS. The age composition of the GOA catches has been estimated annually from 1976 to 2009. These estimates are derived from a combination of at-sea sampling by fishery observers and shore sampling by NMFS technical staff. The estimates are stratified by area and season to account for differences in growth and size at age among regions. Three fishery-independent research surveys are conducted to estimate population abundance and age composition. A bottom trawl survey have been conducted by the AFSC every three years (beginning in 1984) to assess the abundance of groundfish in the Gulf of Alaska. Starting in 2001, the survey frequency was increased to every two years. Echo integration trawl (EIT) surveys have been conducted annually since 1981 (except 1982 and 1999) to assess the biomass and age composition of pollock in the Shelikof Strait area. ADFG has conducted bottom trawl surveys of nearshore areas of the Gulf of Alaska since 1987. In addition, estimates of spawning biomass in Shelikof Strait based on egg production methods were available for 1981, 1985-1992. Results from a number of historical trawl surveys conducted during 1961-1982 were also available. The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys in winter. The *Stock Assessment and Fishery Evaluation* (SAFE) report is compiled annually by the BSAI and GOA Groundfish Plan teams, which are appointed by the Council. The sections are authored by AFSC and State of Alaska scientists. The SAFE reports also include a volume assessing the *Economic Status of the Groundfish Fisheries off Alaska* as well as a volume on *Ecosystem Considerations*. 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. Between 2004 and 2007, 87% of the BS pollock directed catch was taken by vessels with observers onboard and the remaining catch was examined by observers on vessels that received unsorted catch. Between 2004 and 2007, 31% of the GOA pollock directed catch was taken by vessels with observers onboard. Unsorted catches from small vessels are then examined when landed at shoreside plants. The NPFMC and NMFS are undertaking a review of the observer program to address a number of operational concerns. Five restructuring options are being considered and each one includes an increase in coverage for vessels < 60 feet in length.

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). The AFSC operates the following laboratories and Divisions. The Auke Bay Laboratories conducts scientific research on fish stocks, fish habitats, and the chemistry of marine environments. The National Marine Mammal Laboratory conducts research on marine mammals, with particular attention to issues related to marine mammals off the coasts of Oregon, Washington and Alaska.

The Fisheries Monitoring and Analysis Division (FMA) monitors groundfish fishing activities in the US EEZ off Alaska and conducts research associated with sampling commercial fishery catches, estimation of catch and bycatch mortality, and analysis of fishery-dependent data. The Resource Assessment and Engineering Division (RACE) conducts fishery surveys to measure the distribution and abundance of approximately 40 commercially important fish and crab stocks. The Resource Ecology and Fisheries Management Division (REFM) collects data to support management of Northeast Pacific and eastern Bering Sea fish and crab resources. Stock assessments are done annually and used to set catch quotas. Division scientists also evaluate how fish stocks and user groups might be affected by fishery management actions.

C. The Precautionary Approach

National Standard 1 of the MSA, passed in 1976, required that conservation and fisheries management measures prevent overfishing while achieving optimal yield for each fishery on a continuing basis. 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 F_{OFL}, 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. The GOA and BSAI management plans have pre-defined harvest control rules that include limit and target reference points and are used to determine annual catch limits to control exploitation within sustainable bounds and to promote optimal utilisation around MSY. The harvest control rules include a variable harvest rate that is reduced if the stock falls below a target level of B_{MSY}, or its proxy of $B_{40\%}$, in order to promote stock rebuilding. The harvest rate is controlled to be below a limit reference point of F_{OFL}. F_{OFL} is maintained at a constant level of F_{MSY}, or its proxy $F_{35\%}$ when the stock size is above the target. It is reduced if the stock size falls below the target, and is set to 0 if stock size falls below a critical level. The critical level may be adjusted upward if other considerations suggest a more conservative approach is warranted. This critical level has never been approached for EBS and GOA pollock over the history of management under the MSA. This single species approach is applied to all groundfish stocks in Alaska.

The advisory process for Alaskan pollock fisheries has measures built in to further enhance conservation. Stocks are assigned to 1 of 6 “tiers” that represent descending levels of knowledge about their ecology and fishing history. Management reference points differ among the tiers and become more conservative when knowledge is lacking. EBS Pollock is a tier 1 stock and therefore the reference points are based on MSY. The advice from the previous assessment is compared to that from the most recent assessment. It was noted that the 2010 estimate of stock size was considerably higher than that made in 2009 because of higher than expected AT survey estimates in 2010 and the appearance of a strong 2008 year-class. The estimated total biomass in 2011 made in the 2009 assessment was 6,223,300 t while it was 9,620,000 t in 2010. There was a corresponding increase in the OFL for 2011 from 1,220,000 t to 2.447,000 t. Nonetheless, the SAFE report authors recommended an alternative F_{ABC} that would result in a more gradual increase in fishing mortality than the prescribed ABC, and based on the recent average fishing mortality. The difference in forecast fishing mortality is $maxF_{ABC}$ = 0.564 and recommended F_{ABC} = 0.332. EBS pollock is well above target reference point, and it is neither overfished nor approaching overfished conditions.

GOA pollock is a tier 3 stock and therefore the reference points are based on spawner per recruit reference points (e.g. $B_{X\%}$ and $F_{X\%}$). The assessment results indicated that the current stock size was in the range between the limit and target level (moderately increasing), and that the fishing mortality used in the catch forecast should be reduced. The estimated 2011 OFL was 118,030 t, the estimated Allowable Biological Catch (ABC), following the prescribed tier 3 rule, was 102,940 t. The SAFE report author recommended a slightly more conservative ABC rule that had a higher target biomass and this resulted in a recommended ABC of 88,620 t. GOA pollock is considered neither overfished nor approaching overfished conditions.

Another limit reference point used in managing groundfish in the BSAI and GOA is the optimum yield (OY). The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within a given range. The range for BSAI is 1.4 to 2.0 million mt; the range for GOA is 116 to 800 thousand mt. In practice, only the upper OY limit in the BSAI has been a factor in altering harvests. In addition, 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. However, this does not change the specification of ABC or OFL. The B20% also applies to the state PWS fishery.

D. Management Measures

The MSA is the managing federal legislation that defines how fisheries off the United States EEZ are to be managed. From this legislation and Council objectives the management system for the NPFMC groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY (including the BSAI's two million metric tons groundfish complex exploitation cap), TAC, ABC, OFL—effort controls (ITQs, licenses, cooperatives), time and/or area closures (also known as habitat protection, marine reserves), by-catch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), monitoring and enforcement (observer program, U.S. Coast Guard), social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL) and to avoid seabirds). The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information. Federal regulations only provide one method of directed fishing for pollock, the pelagic trawl. There are no destructive fishing gear or methods that are allowed under federal regulations off Alaska. For the PWS state fishery, the only allowed gear for direct targeting of pollock is also pelagic trawl. 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 SSL restrictions, respectively, incorporating federal/Council regulations within state waters. For the pollock fishery, the Council has had to balance the needs of the large, offshore catcher processors and catcher boats that deliver to motherships, both of which catch and process at sea, and the shorebased catcher vessels that deliver shoreside.

The Council also established a policy of full utilization such that the pollock harvest is to be used for human consumption to the maximum extent possible. For the BSAI, it also divided the pollock TAC into two seasonal allowances: roe-bearing ("A" season) and non roe-bearing ("B" season). In the GOA the TAC was separated into four equal quarterly allowances. The percentage of the TAC allocated to each allowance is determined annually during the TAC specifications process. The multiple Council analysis were NEPA compliant, meaning that they evaluated the full array of impacts, seeking out affected parties and providing 10's of hours at most Council meetings to take written and oral testimony from individuals and organizations representing the various stakeholders. The fishery dependence of coastal and western Alaska communities was also addressed through the creation of the pollock, sablefish, and halibut CDQ programs for the BSAI in the early to mid-1990s and the expansion of those programs into the multispecies CDQ Program with the addition of all other groundfish species by 1999.

For several years, the Bering Sea pollock industry has been working on developing a Chinook salmon excluder device for trawl gear, which allows salmon to escape from the trawl net underwater, while retaining pollock. The success of such devices relies on the different swimming behaviors of pollock and Chinook salmon. Through experimental fishery permits authorized by the Council and NOAA Fisheries, various iterations have been tested, and their voluntary use by pollock skippers is increasing. Recently, the GOA pollock industry has begun to consider how the Bering Sea Chinook salmon excluder might be adapted for the smaller GOA pollock fleet.

The Restricted Access Management Program (RAM) is responsible for managing Alaska Region permit programs, including those that limit access to the Federally-managed fisheries of the North Pacific. 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), issues state waters permits and vessel licenses to qualified individuals in both limited and unlimited fisheries, and provides due process hearings and appeals as and when needed. The RAM division as well as the CFEC maintain on their websites, all the fishermen records for which fishing permits are issued.

The North Pacific Fishing Vessel Owners association (NPFVO) provides a large and diverse training program that many of the professional pollock crew members must pass. Also, 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. The goal of the Alaska Maritime Training Center is to promote safe marine operations by effectively preparing captains and crew members for employment in the Alaskan maritime industry. The Alaska Maritime Training Center is a United States Coast Guard (USCG) approved training facility located in Seward, Alaska, and offers USCG/STCW-compliant maritime training. The University of Alaska Sea Grant Marine Advisory Program (MAP) also 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.

E. Implementation, Monitoring and Control

The Alaska pollock fishery fleet uses enforcement measures including an observer program, vessel monitoring systems on board vessels and USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations, especially 50CFR679. 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.

In Alaska waters, enforcement policy section 50CFR600.740 states – (a) The MSA provides four basic enforcement remedies for violations, in ascending order of severity, as follows: (1) Issuance of a citation (a type of warning), usually at the scene of the offense (see 15 CFR part 904, subpart E). (2) Assessment by the Administrator of a civil money penalty. (3) For certain violations, judicial forfeiture action against the vessel and its catch. (4) Criminal prosecution of the owner or operator for some offenses. 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. (b) Processing a case under one remedial form usually means that other remedies are inappropriate in that case. However, further investigation or later review may indicate the case to be either more or less serious than initially considered, or may otherwise reveal that the penalty first pursued is inadequate to serve the purposes of the MSA. Under such circumstances, the Agency may pursue other remedies either in lieu of or in addition to the action originally taken. Forfeiture of the illegal catch does not fall within this general rule and is considered in most cases as only the initial step in remedying a violation by removing the ill-gotten gains of the offense. (c) If a fishing vessel for which a permit has been issued under the MSA is used in the commission of an offense prohibited by section 307 of the MSA, NOAA may impose permit sanctions, whether or not civil or criminal action has been undertaken against the vessel or its owner or operator. In some cases, the MSA requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the MSA treats sanctions against the fishing vessel permit to be the carrying out of a purpose separate from that accomplished by civil and criminal penalties against the vessel or its owner or operator.

The "Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions" issued by NOAA Office of the General Counsel – Enforcement and Litigation on March 16, 2011, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The purpose of this Policy is to ensure that: (1) civil administrative penalties and permit sanctions are assessed in accordance with the laws that NOAA enforces in a fair and consistent manner; (2) penalties and permit sanctions are appropriate for the gravity of the violation; (3) penalties and permit sanctions are sufficient to deter both individual violators and the regulated community as a whole from committing violations; (4) economic incentives for noncompliance are eliminated; and (5) compliance is expeditiously achieved and maintained to protect natural resources. Under this Policy, NOAA expects to improve consistency at a national level, provide greater predictability for the regulated community and the public, improve transparency in enforcement, and more effectively protect natural resources. For significant violations, the NOAA attorney may recommend charges under NOAA's civil administrative process (*see* 15 C.F.R. Part 904), through issuance of a Notice of Violation and Assessment of a penalty (NOVA), Notice of Permit Sanction (NOPS), Notice of Intent to Deny Permit (NIDP), or some combination thereof. Alternatively, the NOAA attorney may recommend that there is a violation of a criminal provision that is sufficiently significant to warrant referral to a U.S. Attorney's office for criminal prosecution. The Marine Division of AWT and the State of Alaska Department of Law pursue a very aggressive enforcement policy. They routinely attend the BOF meetings and are integral into the process for regulation formulation and legislation, analogous to the USCG attendance and input in the Council process.

The Central Bering Sea Fisheries Enforcement Act prohibits vessels and nationals of the United States 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 United States and the Russian Federation are parties. Any violation shall be subject to civil penalties and permit sanctions under section 308 of the Magnuson Fishery Conservation and Management Act. The USCG monitors vessels transiting and operating in the Donut Hole, and takes appropriate action as needed. The USCG also enforces other high seas fishing regulation. For example, in October 16th 2011, NMFS Office of Law Enforcement reported U.S. actions against illegal high seas fishing from the Bangun Perkasa, seized by the Coast Guard about a month before for high-seas drift net fishing more than 2,600 miles south west of Kodiak, Alaska.

F. Serious Impacts of the fishery on the Ecosystem

The NPFMC, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors on pollock and associated species and their habitats. Findings and conclusions are published in SAFE document, annual Ecosystem Considerations documents, and other research reports. The SAFE documents for BSAI and GOA pollock summarize ecosystem considerations for the stocks. They include sections for 1) Ecosystem effects on the stock; and 2) Effects of the pollock fishery on the ecosystem. SAFE reports also describe results of first-order trophic interactions for pollock from the ECOPATH model, an ecosystem modeling software package. Since 2003, SAFE documents for BSAI and GOA have also included an annual summary Ecosystem Assessment in the appendix prepared by the Resource Ecology and Ecosystem Management group at the AFSC. The primary intent of the assessment is to summarize historical climate and fishing effects of the shelf and slope regions of the eastern BSAI, and GOA, and to provide an assessment of the possible future effects of climate and fishing on ecosystem structure and function from an ecosystem perspective. It also looks at the effects of environmental change on fish stocks. Since 1999, the section has included information on indicators of ecosystem status and trends, and more ecosystem-based management performance measures. In addition, the Final Programmatic Supplemental Environmental Impact Statement is an extensive review of the Alaska Groundfish Fisheries (PSEIS) (NMFS 2004). It provides information about affects of the fishery on the ecosystem and effects of the ecosystem on the groundfish fishery.

NOAA also supports the Fisheries And The Environment (FATE) program which aim is on the development, evaluation, and distribution of leading ecological and performance indicators. In addition, the North Pacific ecosystem status report is a contribution by the North Pacific Marine Science Organization (PICES) to identify, describe, and integrate observations of change in the North Pacific Ocean that are occurring now, and have occurred during the past several years. Also, for the Bering Sea, a large multiyear ecosystem project is winding towards completion. It consists of two large projects that will be integrated. One funded by the National Science Foundation (NSF's BEST program is the Bering Ecosystem STudy, a multi-year study (2007-2010)). The other funded by NPRB (BSIERP, is the Bering Sea Integrated Ecosystem Research Program (2008-2012)). The overlapping goals of the these projects led to a partnership that brings together some $52 million worth of ecosystem research over six years, including important contributions by NOAA and the US Fish & Wildlife Service. For the Gulf of Alaska Integrated Ecosystem Research Program, more than 40 scientists from 11 institutions are taking part in the $17.6 million Gulf of Alaska 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**.**

The most obvious fishing effects (overharvest, uncontrolled bycatch or ecosystem effects on apex predators such as Steller sea lions) are closely accounted for in the Councils FMP, and the Ecosystem Chapters and the index analysis provide a mean to evaluate ecosystem fishing effects. An index that has been suggested as a measure of overall top-down control of the ecosystem due to fishing is the trophic level of the fishery. The trophic level of the catch and the Fishery in Balance (FIB) indices have been monitored in the BS, AI, and GOA ecosystems to determine if fisheries have been “fishing-down" the food web by removing top-level predators and subsequently targeting lower trophic level prey. The FIB index was developed by Pauly et al. (2000) to ascertain whether trophic level catch trends are a reaction of deliberate choice or of a fishing-down the food web effect. This index declines only when catches do not increase as expected when moving down the food web (i.e., lower trophic levels are more biologically productive), relative to an initial baseline year. As in any single metrics of trophic level or FIB indices, however, this is best available science, yet it may hide details about fishing events that scientists can’t discern. Actual area by area results are: The AI pollock Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the

AI have been stable and close to their long-term means since 1999. The GOA Total catch, the Trophic Level of the Catch, and the FIB (Fisheries in Balance) indices for the GOA have been stable and close to their long-term means since 1999. The BS Trophic Level of the Catch and the FIB (Fisheries in Balance) indices for the EBS have been stable and close to their long-term means since the 1970s.

Current concerns regarding salmon bycatch in pollock fisheries in the BS and GOA have prompted the Council to take fairly immediate action to place new salmon bycatch controls on the pollock fishery. In the Bering Sea, the Council met with industry and Western Alaskan in-river fishermen concerned with the perceived impacts from salmon bycatch in the pollock fisheries. The Council took action in 2009 to recommend a new approach to managing Chinook salmon bycatch in the Bering Sea pollock fishery under Amendment 91. This new approach combines a limit on the amount of Chinook salmon that may be caught incidentally with incentive plan agreements and performance standards to reduce bycatch. This program was implemented by NMFS for the 2011 fishery. Also, work is ongoing to create a viable salmon excluder device for the pollock fishery. In 2011, the Council approved Chinook salmon prohibited species catch (PSC) limits for the GOA pollock fisheries in the central and western regulatory areas.

Since the NMFS informed the Council about the precipitous decline in the Western discreet population of Steller sea lions (SSL) in 1990, the NPFMC has acted in a precautionary manner to place protections around rookeries and haulouts and close areas where fishing may impact SSL prey. To date, nearly $200,000,000 was appropriated and provided in this research effort. No direct links between fishing and decline or delayed recovery of SSL were evident in this research. The MSA also mandated identification, conservation and enhancement of essential fish habitat (EFH) for managed species. The MSA requires cooperation among NOAA Fisheries Service, fishery management councils, fishing participants, federal and state agencies, and others in achieving EFH protection, conservation and enhancement. The Council implemented the EFH amendments into its GOA and BSAI FMPs, and most recently defined EFH for pollock and all managed species in 2010. Effects of fishing on the seafloor near pollock habitat off Alaska have been largely described as less than minimum and less than temporary.

Further Information

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Table 1: Fishery Application Summary

Applicant Contact Information			
Organization/ Company Name:	Alaska Seafood Marketing Institute on behalf of the Alaska pollock commercial fishery	Date:	April 2010
Correspondence Address:	**International Marketing Office and Administration Suite 200**		
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Nominated Deputy:	***As Above***		
Deputy Phone:	As Above	**Deputy E-mail Address:**	**rrice@alaskaseafood.org**

Table 2: Schedule of Key Assessment Activities

Assessment Activities	Date (s)
Application Date	April 2010
Initial Site Visit Consultation Meetings	June –July 2010
Initial Validation Assessment Report	April 2011
Appointment of Full Assessment Team	July 2011
On-site Witnessed Assessment and Consultation Meetings	August 2011
Draft Assessment Report	August - November 2011
External Peer Review	November 2011
Final Assessment Report	December 2011
Certification Review/Decision	6th December 2011

Table 3: Global Trust Assessment Team Members

Team Member	Role	Team Member	Role
Dave Garforth, Global Trust Certification Ltd. Quayside Business Park Dundalk, Co. Louth Ireland	Lead Assessor	**Vito Ciccia Romito,** Global Trust Certification Ltd. Quayside Business Park Dundalk, Co. Louth Ireland	Assessor
Earl Krygier Anchorage, Alaska 99515, USA.	Assessor	**Alan Sinclair** Parksville, British Columbia, Canada.	Assessor
Stephen Grabacki, Anchorage, Alaska 100506, USA	Assessor		

http://sustainability.alaskaseafood.org/pollock-certification

Table 4: Peer Reviewers

Herman Savikko	Dankert Sakgen
Mr. Savikko worked for the ADFG in fishery management and research positions for 30 years. For the last 9 years of his career, he was the State/Federal Marine Fisheries Coordinator, responsible for coordinating the bio-technical information between the department, the public, the NMFS, the NPFMC and the Alaska BOF. Mr. Savikko was the lead Fishery Biologist on the State's advance team providing the Commissioner of ADFG, a voting NPFMC member, with detailed data on issues and assisted in department policy-making decisions over FMP fisheries. In that role, the team developed policy approaches to improve management and resource sustainability through the implementation of various catch share programs, establishing critical habitat, better data collection and reporting methods, and enhanced enforcement. Scope of projects involving the pollock fisheries off Alaska included the refining of Community Development Quotas Program; resolving issues and actions associated with the listing of Stellar Sea Lions under the federal Endangered Species Act and resulting conflicts with affected commercial fisheries; contribution with the development of the BSAI Chinook Salmon Bycatch EIS, capping the number of Chinook salmon caught incidentally in the Bering Sea/Aleutian Islands pollock fisheries with incentive plan agreements and performance standards; establishment of protected waters under a provision to describe and identify essential fish habitat for FMP fisheries; changes to the fishery observer programs; and State regulatory procedure for 0-3 mile pollock fisheries, handled through active participation in the Alaska Board of Fisheries process.	Dankert Skagen has recently retired from the Institute of Marine Research (IMR), Bergen, where he worked for 22 years. His responsibilities included stock assessment, multispecies work, in particular in the North Sea, work connected to the introduction of the precautionary approach in fisheries and recently, on development of harvest control rules and management strategies. He was leader of the IMR research program for population dynamics and multispecies investigations in 1996-97 and for the development of new assessment tools for North-East arctic cod in 1998-99 and the assessment package TASACS in 2007-08. In addition, he has developed several programs for simulating harvest control rules that are commonly used in fisheries management today. Within ICES, he has participated in a wide range of working groups and been chairman of several of them, including the Study Group of Management Strategies. He was chairman of the Resource Management Committee for 3 years and member of ACFM for 7 years.

Table 5: Certification Committee Members

Peter Marshall, Chairperson **Certification and** **Accreditation Expert** CEO, Global Trust Certification Ltd.	**Bill Paterson,** **Legal / Technical /Certification and** **Accreditation Expert** Global Trust Certification Ltd.
Ciaran Kelly **Fishery Management Expert** Marine Institute. Ireland	**Clare Murray** **Fishery Scientist** Global Trust Certification Ltd.
Also in Attendance	
Vito Ciccia Romito: Fishery Scientist Global Trust Certification Ltd. (Fishery Presentation to Certification Committee only)	
Dave Garforth: Fisheries and Certification Expert Global Trust Certification Ltd. (Fishery Presentation to Certification Committee only)	