FAO-BASED RESPONSIBLE FISHERY MANAGEMENT CERTIFICATION SURVEILLANCE REPORT

For The

Alaska Pollock Commercial Fisheries

Facilitated By the

Alaska Seafood Marketing Institute

Assessors: **Vito Ciccia Romito (Lead Assessor)**
Erica Fruh, Assessor
Geraldine Criquet, Assessor
Rick Stanley, Assessor

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Global Trust Certification Ltd.
Head Office, 3rd Floor, Block 3,
Quayside Business Park,
Mill Street, Dundalk, Co. Louth.
T: +353 42 9320912
F: +353 42 9386864
web: www.GTCert.com

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Glossary

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
NPFMC	North Pacific Fishery Management Council
OFL	Overfishing Level
OLE	Office for Law Enforcement
OY	Optimum Yield
PSC	Prohibited Species Catch
RACE	Resource Assessment and Conservation Engineering
REFM	Resource Ecology and Fisheries Management
RFM	Responsible Fisheries Management
SAFE	Stock Assessment and Fishery Evaluation (Report)
SSC	Scientific and Statistical Committee
SSL	Steller Sea Lion
TAC	Total Allowable Catch
USCG	U.S. Coast Guard

I. Summary and Recommendations

The Alaska Seafood Marketing Institute (ASMI), requested an assessment of the Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries according to the FAO Based Responsible Fisheries Management (RFM) Certification Program. The application was made in April 2010. Assessment commenced in April 2010 with assessment validation before proceeding to full assessment and final certification determination in December 2011.

This report is the **2nd Surveillance Report (ref: AK/POL/001.2/2013)** for the Alaska pollock federal and state commercial fisheries following Certification award against the FAO-Based RFM Program, awarded the 6th December 2011. The objective of the Surveillance Report is to monitor for any changes/updates (after 12 months) in the management regime, regulations and their implementation since the previous assessment (in this case, first surveillance audit in 2012) and to determine whether these changes (if any) and current practices, remain consistent with the overall confidence rating scorings of the fishery allocated during initial certification. In addition to this, any areas reported as "items for surveillance" or corrective action plans in the previous assessment are reassessed and a new conclusion on consistency of these items with the Conformance Criteria is given accordingly. No non-conformances were identified since certification was granted.

The certification covers the Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

The surveillance assessment was conducted according to the Global Trust Certification procedures for FAO – Based Responsible Fisheries Management Certification using the FAO – Based RFM Conformance Criteria V1.2 fundamental clauses as the assessment framework.

The assessment was conducted by a team of Global Trust appointed Assessors comprising of one externally contracted fishery expert and Global Trust internal staff. Details of the assessment team are provided in Appendix 1.

The main Key outcomes have been summarized in Section 5 "Assessment Outcome Summary".

II. Assessment Team Details

Vito Ciccia Romito, Lead Assessor
SAI Global/ Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
T: +353 (0)42 9320912
F: +353 (0)42 9386864

Rick Stanley, Assessor
Independent Fishery Scientist,
British Columbia,
Canada.

Dr. Géraldine Criquet, Assessor
SAI Global/ Global Trust Certification Ltd.
Quayside Business Centre,
Dundalk, Co. Louth, Ireland.
T: +353 (0)42 9320912
F: +353 (0)42 9386864

Erica Fruh, Assessor
SAI Global/ Global Trust Certification Ltd.
Newport, OR
T: +1 541-351-5968

1. Introduction

This Surveillance Report documents the 2nd Surveillance Assessment (2013) of the Alaska pollock commercial federal and state fisheries originally certified on December 6th, 2011, and presents the recommendation of the Assessment Team for continued FAO-Based RFM Certification.

Unit of Certification

The Alaska pollock (or walleye pollock), *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management, underwent their 2nd surveillance assessment against the requirements of the FAO-Based RFM Conformance Criteria Version 1.2 Fundamental clauses.

This 2nd Surveillance Report documents the assessment result for the continued certification of commercially exploited Alaska pollock fisheries to the FAO-Based RFM Certification Program. This is a voluntary program that has been supported by ASMI who wishes to provide an independent, third-party certification that can be used to verify that these fisheries are responsibly managed according to the FAO-Based RFM Program.

The assessment was conducted according to the Global Trust procedures for FAO-Based RFM Certification using the fundamental clauses of the FAO-Based RFM Conformance Criteria Version 1.2 (Sept 2011) in accordance with EN45011/ISO/IEC Guide 65 accredited certification procedures. The assessment is based on the fundamental clauses specified in the FAO-Based RFM Conformance Criteria. It is based on six major components of responsible management derived from the FAO Code of Conduct for Responsible Fisheries (1995) and Guidelines for the Eco-labeling of products from marine capture fisheries (2009); including:

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 (+ 1 in case of enhanced fisheries) that guide the FAO-Based RFM Certification Program surveillance assessment.

A summary of the site meetings is presented in Section 5. Assessors included both externally contracted fishery experts and Global Trust internal staff (Appendix 1).

1.1. Recommendation of the Assessment Team

Following this 2nd Surveillance Assessment, in 2013, the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

2. Fishery Applicant Details

Applicant Contact Information			
Organization/ Company Name:	**Alaska Seafood Marketing Institute**	Date:	**April 2010**
Correspondence Address:	**International Marketing Office and Administration Suite 200**		
Street :	**311 N. Franklin Street**		
City :	**Juneau**		
State:	**Alaska AK 99801-1147**		
Country:	***USA***		
Phone:	**(907) 465-5560**	**E-mail Address:**	***info@alaskaseafood.org***
Key Management Contact Information			
Full Name:	*(Last)* **Rice**	*(First)* **Randy**	
Position:	***Seafood Technical Program Director***		
Correspondence Address:	***U.S. Marketing Office*** ***Suite 310***		
Street :	**150 Nickerson Street**		
City :	***Seattle***		
State:	***Washington 98109-1634***		
Country:	***USA***		
Phone:	**(206) 352-8920**	**E-mail Address:**	*marketing@alaskaseafood.org*
Nominated Deputy:	***As Above***		
Deputy Phone:	**As Above**	**Deputy E-mail Address:**	**rrice@alaskaseafood.org**

3. Unit of Certification

Unit of Certification			
U.S. ALASKA POLLOCK COMMERCIAL FISHERIES			
Fish Species (Common & Scientific Name)	***Geographical Location of Fishery***	***Gear Type***	***Principal Management Authority***
Alaska (Walleye) pollock *Gadus chalcogrammus*, (formerly *Theragra chalcogramma)*	*Gulf of Alaska* *and* *Bering Sea & Aleutian Islands*	*Pelagic trawl,* *And* *Other 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)*

4. Surveillance Meetings

Date	**Organization**	**Relevant Meetings attended**
December 9th-12th 2013.	North Pacific Fisheries Management Council, December 2013 Meetings, Anchorage, Alaska.	- Groundfish Specifications (a) Adopt final harvest specifications (2014 fishing season) for GOA groundfish. (b) Adopt final harvest specifications (2014 fishing season) for BSAI groundfish. - Salmon PSC

5. Assessment Outcome Summary

1. *U.S. Alaska pollock commercial fisheries are managed by the North Pacific Fishery Management Council (NPFMC) and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, Alaska pollock fisheries are managed under the NPFMC's Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The state pollock fishery in Prince William Sound is managed using a Guideline Harvest Level (GHL) set as a percentage of the GOA federal ABC. The US Coast Guard, the NMFS Office of Law Enforcement (OLE) and the Alaska Wildlife Troopers and/or deputized ADFG staff, enforce fisheries regulations in federal and state waters respectively.*

2. *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. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. Accordingly, evidence is present to support that federal and state agencies managing Alaska's coastal resources are capable of and do plan and manage coastal developments in a transparent, organized and sustainable way. The NPFMC and the BOF actively encourages stakeholder participation, and their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums and a process leading up to decision making. By doing so they minimize potential conflicts that could arise in the absence of this process.*

3. *The Magnuson Stevens Fishery Conservation and Management Act (MSA) is the primary domestic legislation governing the management of the nation's marine fisheries. Under the MSA, the 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 Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the pollock fisheries in those regions. Both FMPs present long-term management objectives for the Alaska pollock fishery and were updated in June of 2013. In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF using "5 AAC 28.263. Prince William Sound Pollock Pelagic Trawl Management Plan" which sets the regulations for the directed state pollock fishery.*

4. *The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the pollock fishery and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. Records of catch and effort are firstly recorded through the elanding (electronic fish tickets) catch recording system and secondly, collected by vessel captains in voluntary and required logbooks. Fishery*

independent data are collected in regular surveys of both the GOA and BSAI regions and by the observer program present in both regions. A summer acoustic trawl survey is carried out annually, alternating between the GOA and EBS areas. Bottom trawl surveys are carried out yearly in the EBS and biennially in the GOA and AI. Other sources of data (such as vessel-of-opportunity, crab, and international surveys) are also considered during the stock assessment process. The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys (when possible) in winter.

5. *Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the AFSC. Scientists at the AFSC conduct research and stock assessments on pollock in Alaska each year, producing annual Stock Assessment and Fishery Evaluation (SAFE) reports for the federally managed EBS, GOA, Aleutian Islands and Bogoslof pollock stocks. These SAFE reports summarize the best-available science, including the fishery dependent and independent data, document stock status, significant trends or changes in the resource, marine ecosystems, and fishery over time, assess the relative success of existing state and Federal fishery management programs, and produce recommendations for annual quotas and other fishery management measures. The annual stock assessments are peer reviewed by experts and recommendations are made annually to improve the assessments.*

6. *The NPFMC harvest control system is a complex and multi-faceted suite of management measures to address issues related to sustainability, legislative mandates, and quality of information. The tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The EBS pollock stock in Alaska is categorized as tier 1a while the GOA pollock and AI stocks are categorized as tier 3b. For Tier 1 stocks, reliable estimates are available of B and B_{MSY}, and a reliable probability density function is available for F_{MSY}. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Stocks in tiers 1-3 are further categorized (a) (b) or (c) based on the relationship between B and B_{MSY} (or proxy), with (a) indicating a stock where biomass is above B_{MSY} (or proxy), (b) indicating a stock where biomass is below B_{MSY} but above (0.05 x B_{MSY}), and (c) indicating a stock where biomass is below (0.05 x B_{MSY}). The category assigned to a stock determines the method used to calculate ABC and OFL.*

7. *There are three core components to the application of the precautionary approach in Alaskan groundfish fisheries. Firstly, the FMP for each management area sets out an Optimum Yield (OY) for the groundfish complex as a whole, which includes pollock along with the majority of targeted groundfish species. The second component is the tier system, which assigns each groundfish stock to a tier according to the level of scientific understanding, data available and uncertainty associated with the fishery. Each tier has an associated set of management guidelines, particularly in relation to calculating the level of catch permitted. The more data-deficient a stock, the higher the tier's number, and the more conservatively catch limits are set. At present the GOA and AI pollock fisheries are assigned to tier 3 and the EBS pollock*

fishery to tier 1. The third component is the Annual Catch Limit (ACL), Overfishing Limit (OFL), Acceptable Biological catch (ABC) and Total Allowable Catch (TAC) system. ACL is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures. OFL is the limit reference point of annual catch after which overfishing is determined to be occurring. For Alaska groundfish stocks, OFL is equal to the expected catch that would occur at the rate (or proxy thereof) which is estimated to provide the maximum sustainable yield (Fmsy). ABC is a recommended level of annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. TAC is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty (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).

8. *The Magnuson Stevens Act is the federal legislation that defines how fisheries off the United States EEZ are to be managed. From this legislation and NPFMC objectives, the management system for the Alaska groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY, TAC, ABC, OFL, ACL—effort controls (limited access, licenses, cooperatives), time and/or area closures (habitat protected areas, marine reserves), by-catch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), observers, monitoring and enforcement programs, social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL)). The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information.*

9. *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 rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the pollock stocks in Alaska is neither overfished nor approaching an overfished condition. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC≤ABC<OFL.*

10. *Alaska enhances through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishers are maintained along with their qualifications.*

11. *The Alaska pollock fishery fleet uses enforcement measures including vessel monitoring systems (VMS) on board vessels, USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of*

wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). State regulations are enforced by the Alaska Wildlife Troopers (AWT).

12. *The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations:* ***1)*** *Issuance of a citation (a type of warning), usually at the scene of the offense,* ***2)*** *Assessment by the Administrator of a civil money penalty,* ***3)*** *for certain violations, judicial forfeiture action against the vessel and its catch,* ***4)*** *Criminal prosecution of the owner or operator for some offenses. In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The Alaska Wildlife troopers enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation*.

13. *The NPFMC, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors affecting pollock and associated species and their habitats. Findings and conclusions are published in SAFE documents, 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. Ecosystem modelling is used to provide an indication of the role of pollock within the food web, and broader ecosystem variables such as climate are reported upon annually in a region-encompassing ecosystem considerations analysis. Two significant ecosystem concerns in relation to the pollock fishery are its possible indirect effects on Steller sea lions, and the quantity of salmon bycatch. Both of these issues are addressed directly in the SAFE assessments, and management measures by State and Federal management agencies are in place to attempt and minimize their severity. Biomass of other pollock predators appears to be stable or increasing in recent years. Habitat interactions of this fishery are not considered significant.*

6. Conformity Statement

The Assessment Team recommends that continued certification under the FAO Based Responsible Fisheries Management Program is granted to the Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

7. FAO-Based Conformance Criteria Fundamental Clauses for Surveillance Reporting

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

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

U.S. Alaska pollock commercial fisheries are managed by the North Pacific Fishery Management Council (NPFMC) and the NOAA's National Marine Fisheries Service (NMFS) in the federal waters (3-200 nm); and by the Alaska Department for Fish and Game (ADFG) and the Board of Fisheries (BOF) in the state waters (0-3 nm). In federal waters, Alaska pollock fisheries are managed under the NPFMC's Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) Groundfish Fishery Management Plans (FMPs) written and amended subject to the Magnuson Stevens Act (MSA). The state pollock fishery in Prince William Sound is managed using a Guideline Harvest Level (GHL) set as a percentage of the GOA federal ABC. The US Coast Guard, the NMFS Office of Law Enforcement (OLE) and the Alaska Wildlife Troopers and/or deputized ADFG staff, enforce fisheries regulations in federal and state waters respectively.

The Magnuson-Stevens Fishery Conservation and Management Act (or Magnuson-Stevens Act in short, MSA) provides the primary layer of governance for the federal Alaska pollock fisheries. The 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 Plans (FMPs) must be consistent.

The state of Alaska has its governance authority within the State of Alaska's constitution which calls for management in line with Maximum Sustainable Yield (MSY), and State statutes that reflect regulatory guidance and conservation management requirements developed by the Alaska Board of Fisheries (BOF). This constitutes the State's analog to the federal MSA.

The FMPs, more specifically, 1) the GOA Groundfish FMP, and 2) the BSAI Groundfish FMP govern the management of the pollock federal fisheries. Both the GOA and the BSAI FMPs were most recently updates in June of 2013. In federal waters (3-200 nm), the 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 pollock, Pacific cod, flatfish, Atka mackerel, sablefish, and (offshore) rockfish species

harvested mainly by trawlers, hook and line, longliners and pot fishermen. The NPFMC submits 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, the NMFS Alaska Fisheries Science Center conducts biological studies, annual stock surveys and publishes annual stock assessment reports. The NMFS 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 NPFMC. The US Coast Guard (USCG) is responsible for enforcing FMP regulations at sea, in conjunction with NMFS Office of Law Enforcement (OLE) enforcement ashore. Also, the USCG enforces 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 state fishery is managed by ADFG and the AK BOF; "5 AAC 28.263. Prince William Sound Pollock Pelagic Trawl Management Plan" sets the regulation for the directed state pollock fishery. 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 0.75. Biomass is estimated by state conducted bottom trawl surveys in summer and hydroacoustic surveys in winter (though not in all years). The State sets the GHL, which is deducted from the federal Allowable Biological Catch (ABC).
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 had not been assessed by NMFS GOA surveys; though recently NMFS have assisted with the winter acoustic survey. Therefore, ADFG surveys of pollock in PWS are used to set the Guideline Harvest Level, rather than setting the Guideline Harvest Level in PWS as a fraction of the federal Total Allowable Catch for the Gulf of Alaska.

Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. In these areas the State's Emergency Order adopting federal regulations is used to manage openings, closures and catch. 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. Groundfish fisheries that are not actively managed by the State of Alaska open as parallel fisheries utilizing fishing seasons, bycatch limits, area closures, and allowable gear types (sectors) from federal fishery management measures in adjacent waters of the Exclusive Economic Zone (EEZ). 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

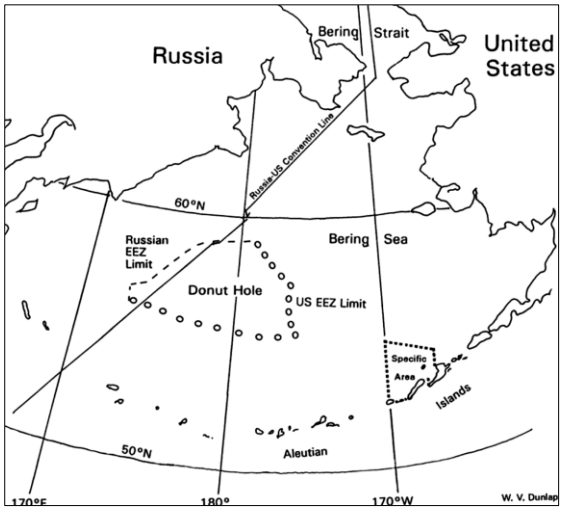
implemented in 2001. The effort in the patrol and enforcement of state waters regulations is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers (AWT).

Intergovernmental Consultative Committee (ICC)

NOAA and the Federal Agency for Fisheries of the Russian Federation signed a Joint Statement on Enhanced Fisheries Cooperation (April 29, 2013). The Joint Statement reaffirms the May 1988 Agreement Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on Mutual Fisheries Relations while also identifying three major areas of future cooperation: 1) combating global Illegal Unreported and Unregulated (IUU) fishing; 2) collaborating on science and management of Arctic Ocean living marine resources ; and 3) advancing conservation efforts in the Ross Sea region of Antarctica. NOAA and the Russian Fisheries Agency have an excellent history of science cooperation. NOAA hopes that the joint statement will further strengthen the foundation of that cooperation. These meetings have also resulted in US vessels conducting acoustical surveys with Russian Federation scientists in the Federation's zone of the Bering Sea (yearly summer surveys).
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/us_russia.html
http://www.nmfs.noaa.gov/ia/slider_stories/2013/04/agreement.pdf
http://www.afsc.noaa.gov/Publications/ProcRpt/PR2013-02.pdf

The Convention on the Conservation and Management of the Pollock Resources in the Central Bering Sea (Also called the "Donut Hole" convention)

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 moratorium is still active. The United States continues to promote and support these international conservation measures (http://www.nmfs.noaa.gov/ia/bilateral/docs/US-Russia_ICC_IA_Book.pdf).

Figure 1. The Donut Hole area in the Bering Sea.

Alaska Pollock across the Russian federation line

In the Gulf of Alaska, pollock are considered as a single stock separate from those in the Bering Sea and Aleutian Islands. They are semi-demersal (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. Pollock enter the fishery around age 3 and live to 15 years or more.
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. 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.

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.

From the most recent published survey report on the 2012 summer acoustic survey (June, 2013), most of the pollock biomass in the U.S. exclusive economic zone (EEZ) was distributed between the Pribilof Islands and Cape Navarin, between roughly the 80 m and 200 m isobaths. Estimated pollock abundance in midwater (between 16 m from the surface and 3 m off bottom) in the U.S. EEZ portion of the Bering Sea shelf was 1.843 million metric tons (t), lower than in 2010 (2.323 million t) but higher than in 2009 or 2008 (0.924 million t, and 0.997 million t, respectively).

Pollock biomass east of 170° W was 0.279 million t, the predominant length mode was 47-48 cm, and most ages ranged between 4 and 7 years. In the U.S. waters west of 170° W, pollock biomass was 1.563 million t (65.4% of total shelf-wide biomass), and dominant modal lengths were 23, 38, and 30 cm, corresponding to pollock aged 2, 4, and 3 years, respectively. In Russia (0.550 million t, 23% of total biomass), modal lengths and ages were similar, though generally smaller and younger than those in the U.S. waters west of 170° W.
http://www.afsc.noaa.gov/Publications/ProcRpt/PR2013-02.pdf

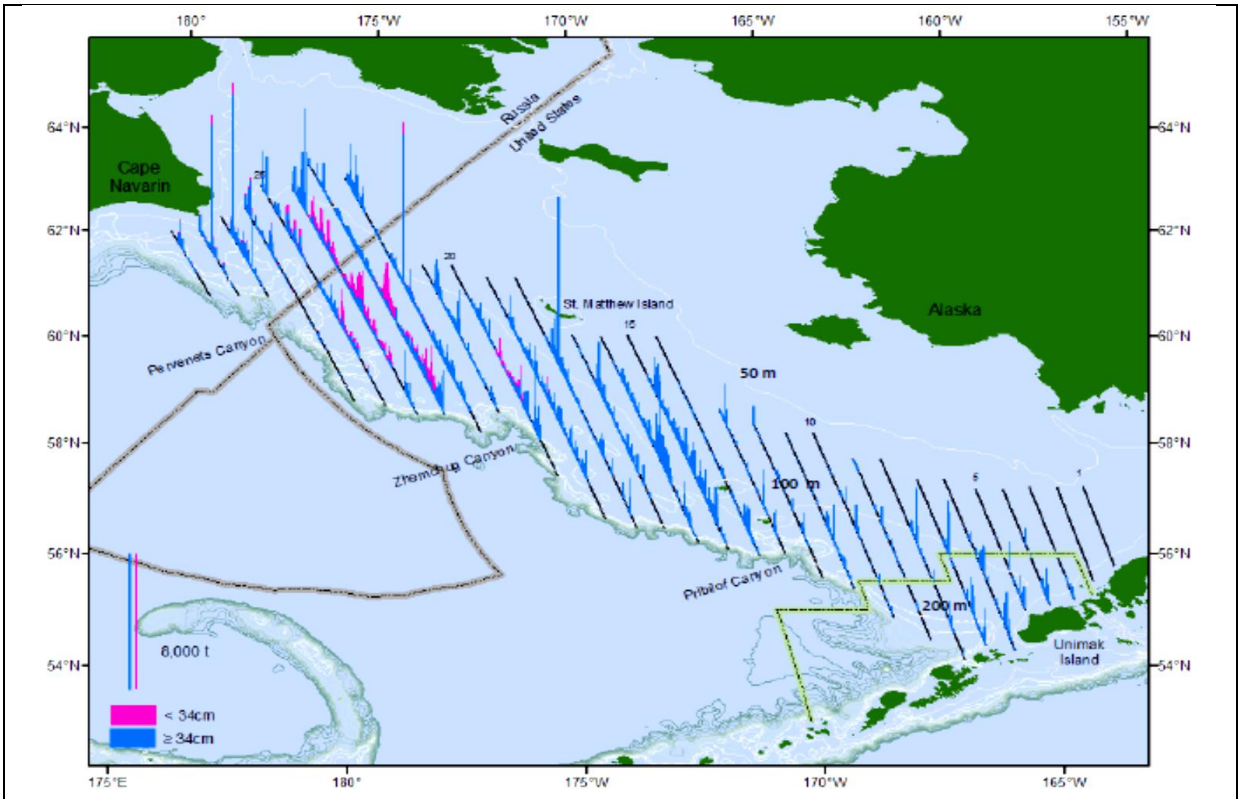


Figure 2. Estimated juvenile (< 34 cm, pink) and adult (≥ 34 cm, blue) walleye pollock biomass by 0.5 nautical mile intervals for the summer 2012 acoustic-trawl survey (16 m from the surface to 3 m off bottom). Transects are marked at their northernmost point and the Steller sea lion Conservation Area (SCA) is outlined (dashed green line).

Table 1. Estimated numbers and biomass of walleye pollock observed between near the surface and 0.5 m off bottom from Bering Sea acoustic-trawl surveys in the US and in the Cape Navarin area of Russia.

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			
2010	US	13.50	2.62	95	US	92,849
	Russia	1.03	0.13	5	US	12,260
	Total	14.53	2.75			
2012	US	7.83	2.38	78	US	96,852
	Russia	2.97	0.66	22	US	15,180
	Total	10.80	3.04			

[1] Note: near bottom estimates (0.5-3 m off bottom) should be interpreted with caution as there is a greater likelihood for species contamination and fewer hauls were made in this zone than in the midwater zone above.

These surveys are largely carried out by the U.S. (apart in 2002 by Russia). Stock assessments used for management of the stock in Alaska (setting the upper limit of the TAC) have considered this migration and possible removals using sensitivity analyses. Results of these sensitivity analysis 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 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.

Evidence

http://www.nmfs.noaa.gov/sfa/magact/mag1.html#s2
http://alaskafisheries.noaa.gov/npfmc/
http://alaskafisheries.noaa.gov/
http://www.uscg.mil/hq/cg5/cg531/LMR.asp
http://www.afsc.noaa.gov/REFM/Docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOApollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/BOGpollock.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf
http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.management
http://www.dps.alaska.gov/awt/Marine.aspx

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

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating Determination

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. The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. Accordingly, evidence is present to support that federal and state agencies managing Alaska's coastal resources are capable of and do plan and manage coastal developments in a transparent, organized and sustainable way. The NPFMC and the BOF actively encourages stakeholder participation, and their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums and a process leading up to decision making. By doing so they minimize potential conflicts that could arise in the absence of this process.

NEPA

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.

The NEPA processes provide public information and opportunity for public involvement that are robust and inclusive at both the state and federal levels. Fisheries are relevant to the NEPA process in two ways. First, each significant NPFMC fisheries package must go through the NEPA review process. Second, any project that could impact fisheries (i.e., oil and gas, mining, coastal construction projects, etc.,) that is either on federal lands, in federal waters, receives federal funds or requires a federal permit, must go through the NEPA process. In this manner, both fisheries and non-fisheries projects that have a potential to impact fisheries have a built in process by which concerns of the NPFMC, NMFS, state agencies, industry, other stakeholders or the public can be taken into account (http://www.epa.gov/oecaerth/basics/nepa.html#process).

DEC, ADFG, DNR and the USFWS

The 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 (http://dec.alaska.gov/).

ADFG, on the other hand, protects estuarine and marine habitats primarily through cooperative efforts involving other state and federal agencies and local governments. ADFG has jurisdiction over the mouths of designated anadromous fish streams and legislatively designated state special areas (critical habitat areas, sanctuaries and refuges). For these state areas, the ADFG Habitat Division

requires a permitting process to assure that proposed impacts are evaluated and controlled. Some marine species also receive special consideration through the state Endangered Species program (http://www.adfg.alaska.gov/index.cfm?adfg=lands.main).

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 U.S. Fish and Wildlife Service (USFWS) is a federal bureau within the Department of the Interior. Its objectives include 1) assisting in the development and application of an environmental stewardship ethic, based on ecological principles, scientific knowledge of fish and wildlife, and a sense of moral responsibility; 2) guide the conservation, development, and management of the US's fresh water fish and some marine and terrestrial wildlife resources, 3) administer a national program to provide the public opportunities to understand, appreciate, and wisely use fish and wildlife resources. The USFWS functions include enforcement of federal wildlife laws, protection of endangered species, management of migratory birds, restoration of nationally significant fisheries, conservation and restoration of wildlife habitat such as wetlands, help of foreign governments with their international conservation efforts, and distribution of hundreds of millions of dollars, through the Wildlife Sport Fish and Restoration program, in excise taxes on fishing and hunting equipment to State fish and wildlife agencies http://www.fws.gov/help/about_us.html).

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 management, 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/).

BOEM

The Bureau of Ocean Energy Management (previously Minerals and Management) is responsible for managing environmentally and economically responsible development and provide safety and

oversight of the offshore oil and gas leases. This process routinely overlaps with evaluation of potential impacts to fisheries and marine ecosystems and therefore with some of the federal agencies reported in the above paragraphs (http://www.nmfs.noaa.gov/pr/permits/eis/arctic.htm http://www.boem.gov/About-BOEM/BOEM-Regions/Alaska-Region/Index.aspx).

Stakeholder engagement

With regards to conflict avoidance and resolution between different fisheries and/or users within fisheries, the NPFMC and the BOF tend to avoid this 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. The NPFMC and BOF hold an annual coordinating meeting where members consider issues and hear testimony from stakeholders concerning joint BOF/NPFMC issues. Both entities provide a great deal of information on their websites, including agenda of meetings, discussion papers, and records of decisions. The NPFMC and the BOF actively encourages stakeholder participation, and their deliberations are conducted in open, public sessions. Effectively, these meetings provide forums for avoidance and resolution of potential fisheries conflicts. Alternatively courts of law provide resolution centers for legal disputes. The Council and the AK BOF as part of their process assesses economic, social and cultural value of the fishery resources in order to assist decision-making, allocation and use.

The assessment team agrees that collectively the NEPA process, the institutional capacity of existing agencies (e.g. ADFG, ADEC, DNR, USFWS, ANILCA , OPMP and BOEM), and the existing intimate and routine cooperation between federal and state agencies managing Alaska's resources is capable of planning and managing coastal developments in a transparent, organized and sustainable way.

Evidence

http://www.fakr.noaa.gov/habitat/default.htm
http://www.adfg.alaska.gov/index.cfm?adfg=habitatregulations.main
http://www.adfg.alaska.gov/index.cfm?adfg=habitatresearch.main
http://dec.alaska.gov/water/MoreAboutWater.htm
http://alaskafisheries.noaa.gov/ram/
http://dnr.alaska.gov/commis/opmp/anilca/
http://dnr.alaska.gov/commis/opmp/

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The Magnuson Stevens Fishery Conservation and Management Act (MSA) is the primary domestic legislation governing the management of the nation's marine fisheries. Under the MSA, the 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 Groundfish FMPs for the Gulf of Alaska and the Bering Sea & Aleutian Islands which incorporate the pollock fisheries in those regions. Both FMPs present long-term management objectives for the Alaska pollock fishery and were updated in June of 2013. In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF using "5 AAC 28.263. Prince William Sound Pollock Pelagic Trawl Management Plan" which sets the regulations for the directed state pollock fishery.

GOA and BSAI FMPs objectives

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:

1) Prevent Overfishing;
2) Promote Sustainable Fisheries and Communities;
3) Preserve Food Webs;
4) Manage Incidental Catch and Reduce Bycatch and Waste;
5) Avoid Impacts to Seabirds and Marine Mammals;
6) Reduce and Avoid Impacts to Habitat;
7) Promote Equitable and Efficient Use of Fishery Resources;
8) Increase Alaska Native Consultation and;
9) 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 these management plans. 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. The BSAI and GOA FMPs define specific management measures to avoid excess fishing capacity and maintain stocks that are economically viable for the fishing communities and industry to harvest and process. Management objectives to promote economic conditions for responsible fisheries, take into account the interests of subsistence, small-scale, and artisanal fisheries, define three management objectives to conserve biodiversity of aquatic habitats and protect endangered species; and describe management measures to assess environmental impacts from human activities.

https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf

The Restructured Observer program.

In 2013 NMFS restructured the North Pacific Groundfish and Halibut Observer Program and the new Program went into effect on January 1, 2013. Program changes restructure the funding and deployment system for observers and they expand observer coverage to vessels less than 60 feet length overall (LOA). To establish the program, NMFS approved amendment 86 to the FMP for Groundfish of the BSAI Management Area and Amendment 76 to the FMP for Groundfish of the GOA in 2012. The program was implemented and became operational in January 2013.

State Management: 5 AAC 28.089 Guiding Principles for groundfish fishery regulations

The BOF will, to the extent practicable, consider the following guiding principles when taking actions associated with the adoption, amendment, or repeal of regulations regarding groundfish fisheries:

(1) conservation of the groundfish resource to ensure sustained yield, which requires that the allowable catch in any fishery be based upon the biological abundance of the stock;
(2) minimization of bycatch of other associated fish and shellfish and prevention of the localized depletion of stocks;
(3) protection of the habitat and other associated fish and shellfish species from non sustainable fishing practices;
(4) maintenance of slower harvest rates by methods and means and time and area restrictions to ensure the adequate reporting and analysis necessary for management of the fishery;
(5) extension of the length of fishing seasons by methods and means and time and area restrictions to provide for the maximum benefit to the state and to regions and local areas of the state;
(6) harvest of the resource in a manner that emphasizes the quality and value of the fishery product;
(7) use of the best available information presented to the board; and
(8) cooperation with the NPFMC and other federal agencies associated with groundfish fisheries management.
http://www.touchngo.com/lglcntr/akstats/aac/title05/chapter028/section089.htm

Prince William Sound FMP

In state waters (0-3 nm), the Prince William Sound (PWS) pollock fishery is managed by ADFG and the BOF; "*5 AAC 28.263. Prince William Sound Pollock Pelagic Trawl Management Plan*" sets the regulation for the directed state pollock fishery. The plan indicates the three fishery subareas in PWS (Bainbridge Section; Knight Island Section; Hinchinbrook Section), the gear allowed (pelagic trawl), the maximum guideline harvest level percentage that can be taken out any of these areas (60%), and the total bycatch weight of all species allowed (5% of total round weight of pollock harvested). To assure the harvest levels and bycatch caps are controlled, the BOF implemented a 300,000 pound trip limit in the PWS pollock fishery (5 AAC 28.070 & 5 AAC 28.073). This assures an orderly fishery

and controls harvest power in a remote trawl fishery.
The directed walleye pollock pelagic trawl fishery in the Prince William Sound (PWS) Management Area Inside District opened January 20 with a fishery guideline harvest level (GHL) of 5.78 million pounds. The Inside District is divided into three sections: Hinchinbrook, Knight Island, and Bainbridge and the total harvest from a section is restricted to 60% of the GHL. The Hinchinbrook Section closed at 4:00 p.m. January 22 based upon the predicted achievement of the maximum 60% section harvest level. Preliminary harvest reports and harvest projections indicated the balance of the GHL would have been taken by 12:00 midnight February 3, 2013. Therefore, the directed walleye pollock pelagic trawl season in the Knight Island and Bainbridge Sections of the PWS Management Area was closed at 12:00 midnight February 3, 2013 for the remainder of the calendar year.
This action effectively closed the PWS directed pollock trawl fishery for 2013.

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/{@1}?firsthit
http://dps.alaska.gov/AWT/mission.aspx
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/245938914.pdf
http://www.alaskaoutdoor.com/akforum/index.php?topic=37.0

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
ECO 29.1-29.3

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

The NMFS and the ADFG collect fishery data and conduct fishery independent surveys to assess the pollock fishery and ecosystems in GOA and BSAI areas. GOA and BSAI SAFE documents provide complete descriptions of data types and years collected. Records of catch and effort are firstly recorded through the elanding (electronic fish tickets) catch recording system and secondly, collected by vessel captains in voluntary and required logbooks. Fishery independent data are collected in regular surveys of both the GOA and BSAI regions and by the observer program present in both regions. A summer acoustic trawl survey is carried out annually, alternating between the GOA and EBS areas. Bottom trawl surveys are carried out yearly in the EBS and biennially in the GOA and AI. Other sources of data (such as vessel-of-opportunity, crab, and international surveys) are also considered during the stock assessment process. The Prince William Sound pollock stock is estimated by ADFG bottom trawl surveys in summer and hydroacoustic surveys (when possible) in winter.

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, EBS, AI and Bogoslof Islands SAFE documents provide complete descriptions of data types and years collected (Table 2 and 3). For the 2012 GOA SAFE all pre-1984 trawl survey data was excluded and the egg production index (1981-1992) was removed from the model.

Table 2. Summary of data sources available for GOA stock assessment.

Source	Data	Years
GOA bottom trawl survey	Biomass estimate, size, age, sex	1984, 1987, 1990, 1993, 1996, 1999, 2001, 2003, 2005, 2007, 2009, 2011
Shelikof straight acoustic survey	Biomass estimate, size, age	Annual since 1981, excluding 1982, 1999 and 2011
Winter acoustic survey	Biomass estimate, size, age	Biennial in even-numbered years, 1983-2012 except years 1999 & 2011 for the winter Acoustic survey
ADFG crab & groundfish trawl survey	Biomass estimate, size, age	Annual since 1987
Fishery observer data	Pollock discard	Annual

	estimates, size and age composition	
Landings data	Total landings, size and age composition	Annual through 2012

Table 3. Summary of data sources available for EBS stock assessment.

Source	Data	Years
Continental shelf bottom trawl survey	Biomass estimate, size, age, stomach contents	Annually since 1971 (consistent gear since 1982)
Summer acoustic survey	Biomass estimate, size, age	1979, 1982, 1985, 1988, 1991, 1994, 1996, 1997, 1999, 2000, 2002, 2004, 2006-10, and 2012
Acoustic-vessels-of-opportunity data	Midwater biomass index, geographical distribution data	First utilized in 2011
Western BS Shelf and Navarin Basin or shelf	Biomass estimate, size composition	1990-2011
BASIS survey	Abundance index, ecosystem data	Annual since 2006
Fishery observer data	Pollock discard estimates, size and age composition	Annual since 1991
Landings data	Total landings, size and age composition	Annual through 2012

Fishery dependent data collection

Since 1988, only U.S. vessels have been operating in the pollock fisheries of Alaska and by 1991, the current NMFS observer program for north Pacific groundfish fisheries was in place. State and federal landings have been recorded by a combination of NMFS at-sea production reports, dealer landing and transfer reports, ADFG fish tickets and more recently the electronic *e*Landings system.

The catches used in the Alaskan pollock stock assessments include totals from the federal BSAI and GOA federal fisheries as well as the state-managed PWS pollock fishery, which are reported on the *e*Landings reporting system. The *e*Landings information feeds directly into the Alaska Regional Office catch reporting system, the source of the catch data used in this assessment. Landings are verified by shore-based observers. Estimates of discards are compiled from fishing logbooks and at-sea observer data. The size and age composition of the catches has been estimated annually since 1979. These estimates are derived from a combination of at-sea and shore-based sampling at processing locations by NMFS certified fishery observers. The estimates are stratified by area and season to account for differences in growth and size at age among regions.

Restructured Observer Program: Annual Deployment Plan for 2013

The first (2013) Annual Deployment Plan (ADP) places all vessels and processors into one of two observer coverage categories: (1) a full coverage category, and (2) a partial coverage category.

Full Coverage Category

The new Observer Program did not affect full observer coverage requirements for vessels > 125 feet or catcher processors and motherships that discard and process fish onboard. Other full coverage vessels include catcher vessels belonging to catch share programs with prohibited species caps, Bering Sea Alaska pollock vessels, and Gulf of Alaska rockfish vessels. They obtain observers using status-quo (pay as you go) methods for all their trips.

Partial Coverage Category

Vessels in the new partial coverage category have experienced substantial changes in how observers are deployed and paid for. The Partial Coverage category includes vessels whose fishing operations are not required by federal regulation to always carry an observer. This category is divided into two sampling strata depending on the method used to deploy observers: trip-selection and vessel-selection.

Trip Selection pool. This category applies to all catcher vessels of any length fishing with trawl gear, and to hook-and-line and pot gear vessels that are greater than or equal to 57.5 feet LOA. Each fall, owners of vessels placed in this pool receive a letter that lists their vessels assigned to this pool and describes how to access and log trips into and Observer Declare and Deploy System (ODDS). NMFS developed ODDS, to facilitate the random assignment of observers to trips. Vessel owners or operators with vessel/s is in the trip selection pool are required to log each fishing trip into ODDS and is immediately informed if the trip has been randomly selected for observer coverage. The observer is provided by a NMFS contractor. Vessel owners or operators in this pool are required to log fishing trips at least 72 hours before anticipated departure.

Vessel Selection pool. This category applies to catcher vessels fishing with hook-and- line and pot gear that are less than 57.5 feet LOA and, for the first year, greater than or equal to 40 feet LOA. Each fall, owners of vessels placed in this pool receive a letter that lists their vessels assigned to this pool. Vessel owners or operators in this pool are not required to log trips into ODDS. However, a subset of vessels, randomly selected by NMFS, is required to take observers for every groundfish or halibut fishing trip that occurs during a specified 2-month period. Owners of selected vessels are contacted by NMFS at least 30 days in advance of the 2-month period.

Zero Coverage pool. In 2013, the first year of the program, this category applies to all vessels less than 40 feet LOA and catcher vessels fishing with jig gear (which includes handline, jig, troll, and dinglebar troll gear). Vessel owners or operators in this pool will not be required to take observers for the first year of the program. Landings from vessels with zero coverage will still be assessed the landing fee.

Improved statistical reliability

These changes are intended to increase the statistical reliability of catch and bycatch data, address cost inequality among fishery participants, and expand observer coverage to previously unobserved

fisheries. The sampling methods in the 2013 Annual Deployment Plan (ADP) achieves representative sampling of fishing events for vessels greater than or equal to 40 feet LOA and not fishing jig gear. As a result, the coverage rate is almost the same across all partially observed fisheries and it enables scientists to establish a baseline of unbiased observer data across all sectors. Moreover, the new Observer Program will provide better spatial and temporal distribution of observer coverage across all fisheries. It is intended to improve confidence in catch and bycatch estimation and the overall quality of data collected in all federal fisheries. These changes are intended to reduce bias in observer data, improve catch estimates, and lay the groundwork for cost-effective improvements to sampling methods implemented in future ADPs.

Program costs and deployment rates

NOAA Fisheries is providing the $4.48 million start-up funding for the first year of this partial coverage category program. The fees collected from industry will fund the program in subsequent years. Total program funds cover both at-sea coverage and at dockside deployment.

NMFS and the Council created the ADP process to provide flexibility in the deployment to meet scientifically based estimation needs. NMFS and the Council recognized that coverage rates for any given year would be dependent on available revenue and anticipated vessel-days at-sea and these annual changes in revenue and costs are inherent in the program. This flexibility allows NMFS to optimize deployment in each year so that statistically robust sampling can be achieved in a cost-effective manner.

The distribution of days fished by location will influence costs in 2013, therefore a simulation of potential fishing activity was used to develop a budget for the deployment of observers into the partial coverage category. An at-sea budget was developed by using 2011 as the base year of effort and simulating the deployment rate that resulted in 88 to 92% of the simulated values being less than or equal to the available funds after subtracting the cost of dockside sampling.

Observer Program Fees

Starting in 2013, processors and registered buyers will be required to pay an ex-vessel value-based fee to NMFS to support the funding and deployment of observers on vessels and in plants in the new partial observer coverage category. The fee is intended to be split evenly between the vessel owner/operator and processor or registered buyer. The observer fee is 1.25% of the ex-vessel value of the groundfish and halibut subject to the fee. Ex-vessel value will be based on standard ex-vessel prices from prior years. The fee liability started to accrue on January 1, 2013. The first fee submission by processors and registered buyers for 2013 landings will be due to NMFS by February 15, 2014. Full payment of the observer fee liability will be required before NMFS will issue a new or renewed Federal Processor Permit (FPP) or Registered Buyer permit.

Electronic monitoring

NMFS is working collaboratively with the Council to develop an Electronic Monitoring (EM) Strategic Plan to integrated video monitoring into the Observer Program. In 2013 pilot project, NMFS issued a contract to construct, deploy, and maintain a video based EM system on volunteering vessels in the vessel-selection pool. At the end of the study, NMFS will evaluate the efficacy of electronic monitoring to collect catch and discard data in the hook-and-line halibut and sablefish fleets on

vessels between 40 ft LOA and 57.5 ft LOA.
http://www.st.nmfs.noaa.gov/observer-home/regions/northpacific/north-pacific-alaska
http://www.afsc.noaa.gov/FMA/default.htm
http://alaskafisheries.noaa.gov/sustainablefisheries/observers/

Dockside Deployments

Dockside observer duties vary between those observers that are deployed to monitor deliveries that occur in full-coverage operations and those that are deployed outside of full coverage operations. Full-coverage dockside operations include only those processors that take deliveries from American Fisheries Act vessels delivering pollock in the Bering Sea and Aleutian Islands. These processors are required by federal regulation to have observers available to sample shoreside deliveries while they are processing (accepting) deliveries of BSAI AFA pollock. In these full-coverage operations, an observer records delivery information, salmon bycatch information (e.g. total number of fish), collects specimens for genetic analysis from salmon, and collects otoliths and lengths from groundfish (to support stock assessments). Observers collect salmon genetic tissues according to the protocols of Pella and Geiger (2009), which requires a systematic sample of every n^{th} salmon to ensure a uniform random sample of the bycatch is obtained.
Observers in plants not receiving AFA pollock deliveries are in the partial coverage category. Small catcher 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 shore-side plants where there is 100% observer coverage.
The 2013 ADP established the collection of tissue samples from Chinook salmon in the Gulf of Alaska pollock fishery as sampling priority for shoreside observers. Observers in this situation are supposed to be notified by industry of a pollock delivery- if this condition is not met the delivery will not be monitored. Once in the plant, the partial-coverage observer records delivery information, salmon bycatch information (e.g. total number of fish) and collect specimens for genetic analysis from salmon according to the protocols of Pella and Geiger (2009). Shoreside counts of salmon are used to estimate salmon bycatch in the Catch Accounting System (CAS) only when the trip is observed whereas genetic samples are collected from both observed and unobserved trips.

Since catch delivered by a tender is sorted at sea and may include the harvests of several vessels, the observer does not sample from or monitor these offloads. They record only the basic information on the tender vessel from information on the landing report: date, gear, area fished, delivered weight and program management code.
In the first sixteen weeks of 2013, a total of 748 deliveries of AFA pollock were made. True to expectations of the 2013 ADP, all of these deliveries were observed dockside and none of the observers were restructured observers (that is, employed by the observer provider company under contract by NMFS to provide coverage for the partial coverage strata). During the same time period, 439 non-AFA pollock deliveries were made and eighty-eight percent of these were observed and sampled for salmon genetics. In 2013, Kodiak was the principal port of deployment for partial coverage dockside observers since this port received the most Gulf of Alaska pollock deliveries and the port is relatively easy to reach. Kodiak had all but one delivery observed.

Table 4. Number of non-AFA pollock deliveries observed and unobserved.

Port	Unobserved	Observed	Total	Percent observed
Akutan	31	6	37	16.2
Inshore Floating- Dutch	2	6	8	75.0
King Cove	9	0	9	0.0
Kodiak	1	368	369	99.7
Seward	6	0	6	0.0
Sand Point	2	8	10	80.0
Total	51	388	439	88.4

PARTIAL COVERAGE FLEET

The Partial Coverage category, which started in January 2013, includes vessels whose fishing operations are not required by federal regulation to always carry an observer. This category is divided into two sampling strata depending on the method used to deploy observers: trip-selection and vessel-selection.

Trip Selection

A total of 1,300 trips were made by 206 vessels ranging from 58 to 176 feet in length in this stratum during the first sixteen weeks of 2013. Observer (NORPAC) data indicates that 17.7% of these trips were observed.

Vessel Selection

A total of 141 vessels ranging from 40 to 57 feet LOA in length made 507 deliveries in this stratum during the first sixteen weeks of 2013. Over both two-month sample periods, 11.8% of trips in this stratum were observed.

In response to performance and issues identified in the restructured observer program, the NPFMC made the following recommendations for the June 2014 review of the observer program:

1. Include information on the volume of catch observed in both vessel and trip selection pools.
2. Include information on achieved coverage rates by gear type (trawl vs fixed gear).
3. Include information on trip length by observed and unobserved vessels in both the trip and vessel selection pools. Within the vessel selection pool, break out the IFQ fleet.
4. A review of the trip selected and vessel selected pools in consideration of whether vessels should have an option to choose either one, or whether the deployment plan should place every vessel in the partial coverage category in the trip selection pool (Dec. 2012 request).
5. An evaluation of the difference between observer coverage in the vessel and trip selection pools (a review of the sampling method) (Dec. 2012 request).
6. An evaluation of ways to insert cost effective measures into the deployment plan (Dec. 2012 request).
7. An evaluation of detailed programmatic costs (Dec. 2012 request).

Table 5. Number of deliveries made in each stratum by observation status, whether a delivery was made to a tender vessel (offload type) and the sampling unit used (Rate Type). *: Observer data confirms that all trips were observed. This number is less than 100% because a field in NORPAC had not yet been updated in observer debriefing at the time of this writing.

Sampling Frame	Observed	Count	Observed	Offload Type	Rate Type
Vessel-Selection	43	440	9.8%	NonTender	Trip
Trip-Selection	220	1196	18.4%	NonTender	Trip
Full-Coverage	2,627	2,635	99.7%*	NonTender	Trip
No-Coverage	0	236	0.0%	NonTender	Trip
Vessel-Selection	17	67	25.4%	Tender	Trip
Trip-Selection	16	134	11.9%	Tender	Trip
Full-Coverage	12	12	100.0%	Tender	Trip
No-Coverage	0	39	0.0%	Tender	Trip
Vessel-Selection	60	507	11.8%	All	Trip
Trip-Selection	236	1330	17.7%	All	Trip
Full-Coverage	2,639	2,647	99.7%*	All	Trip
No-Coverage	0	275	0.0%	All	Trip
Vessel-Selection	15	172	8.7%	All Non Tender	Vessel
Vessel-Selection	5	27	18.5%	At Least One Tender	Vessel
Vessel-Selection	15	149	10.1%	All	Vessel

http://alaskafisheries.noaa.gov/sustainablefisheries/observers/draft2014adp.pdf

Catch data

Table 6. Gulf of Alaska catch report through September 28, 2013 (catch data shown in mt).

Western, Central Pollock

Seasons	Account	Total Catch	Quota	Remaining Quota	% Taken	Last Week Catch
X	Pollock, 610 Shumagin	7,086	28,072	20,986	25%	76
X	Pollock, 620 Chirikof	43,363	51,443	8,080	84%	0
X	Pollock, 630 Kodiak	18,299	27,372	9,073	67%	104

West Yakutat

Seasons	Account	Total Catch	Quota	Remaining Quota	% Taken	Last Week Catch
	Pollock	2,940	3,385	445	87%	0

Southeast

Seasons	Account	Total Catch	Quota	Remaining Quota	% Taken	Last Week Catch
	Pollock	0	10,774	10,774	0%	0

http://alaskafisheries.noaa.gov/2013/car110_goa.pdf

Table 7. BSAI catch report through September 28, 2013 (catch data shown in mt).

Bering Sea

Seasons	Account	Total Catch	Quota	Remaining Quota	% Taken	Last Week Catch
X	Pollock, AFA Inshore	538,667	550,801	12,134	98%	5,080
X	Pollock, AFA Catcher Processor	433,367	440,640	7,273	98%	5,418
X	Pollock, AFA Mothership	110,026	110,160	134	100%	0
X	Pollock CDQ	123,075	126,600	3,525	97%	544
	Pollock, Incidental Catch, non-Bogoslof (includes CDQ)	35,542	33,699	-1,843	105%	1,423
	Pollock, Incidental Catch, Bogoslof (includes CDQ)	57	100	43	57%	0

Aleutian Islands

Seasons	Account	Total Catch	Quota	Remaining Quota	% Taken	Last Week Catch
X	Pollock	0	2,500	2,500	0%	0
X	Pollock CDQ	0	0	0	0%	0
X	Pollock, Incidental Catch (includes CDQ)	2,919	1,600	-1,319	182%	2

http://alaskafisheries.noaa.gov/2013/car110_bsai_with_cdq.pdf

Table 8. Walleye Pollock harvest in millions of pounds from the Central and Western Gulf of Alaska, 1995-2011 (with percentage of catch harvested in state waters).

NMFS Area	Year	Vessels	Landings	Pounds	State Waters Harvest (%)[a]	Discards at Sea
Central GOA	1995	162	934	74.0	12	1.3
	1996	134	1,035	50.4	28	1.6
	1997	190	1782	121.4	31	1.9
	1998	166	1,847	206.8	34	0.4
	1999	164	1,484	148.2	27	0.5
	2000	137	1,328	106.2	4	0.5
	2001	157	1,421	87.0	21	0.3
	2002	135	1,095	71.0	43	0.2
	2003	120	945	71.8	23	0.2
	2004	108	895	86.7	37	0.4
	2005	105	937	102.9	23	0.3
	2006	123	1,388	96.9	29	0.2
	2007	165	1,635	73.0	26	0.3
	2008	175	1,578	71.5	31	1.0
	2009	167	1,351	53.8	35	0.6
	2010	164	1,477	101.6	23	1.0
	2011	189	1,595	122.0	10	1.7
10-Yr. Average		145	1,290	85.1	28	0.6

NMFS Area	Year	Vessels	Landings	Pounds	State Waters Harvest (%)[a]	Discards at Sea
Western GOA	1995	101	361	65.7	34	0.8
	1996	59	322	52.2	60	0.8
	1997	85	334	62.5	32	0.7
	1998	94	381	65.7	58	0.1

	1999	90	454	52.8	53	0.3
	2000	74	474	47.3	79	0.1
	2001	68	582	67.5	74	0.1
	2002	53	334	38.2	49	0.2
	2003	55	280	37.1	54	0.1
	2004	59	415	50.9	61	0.1
	2005	60	584	67.9	49	0.1
	2006	64	664	53.8	62	0.2
	2007	62	633	38.2	53	0.1
	2008	57	491	32.8	34	0.0
	2009	64	416	30.7	68	0.1
	2010	67	642	57.1	58	0.1
	2011	72	721	45.0	53	0.2
10-Yr. Average		61	518	45.1	54	0.1

Note: Harvest reported in (millions) whole fish pounds. Discards at sea are excluded from all but the Discards at Sea column

[a] Percent of total walleye pollock harvested in state waters (0 to 3 nmi).

http://www.adfg.alaska.gov/FedAidPDFs/FMR12-52.pdf

Table 9. Walleye pollock catch (t) in the Gulf of Alaska. The TAC for 2012 is for the area west of 140 ° W lon. (Western, Central and West Yakutat management areas) and includes the guideline harvest level for the state-managed fishery in Prince William Sound (2,770 t).

Year	*Foreign*	*Joint Venture*	*Domestic*	*Total*	*TAC*
1964	1,126			1,126	---
1965	2,749			2,749	---
1966	8,932			8,932	---
1967	6,276			6,276	---
1968	6,164			6,164	---
1969	17,553			17,553	---
1970	9,343			9,343	---
1971	9,458			9,458	---
1972	34,081			34,081	---
1973	36,836			36,836	---
1974	61,880			61,880	---
1975	59,512			59,512	---
1976	86,527			86,527	---
1977	117,834		522	118,356	150,000
1978	96,392	34	509	96,935	168,800
1979	103,187	566	1,995	105,748	168,800
1980	112,997	1,136	489	114,622	168,800
1981	130,324	16,857	563	147,744	168,800
1982	92,612	73,917	2,211	168,740	168,800
1983	81,358	134,131	119	215,608	256,600
1984	99,260	207,104	1,037	307,401	416,600
1985	31,587	237,860	15,379	284,826	305,000
1986	114	62,591	25,103	87,809	116,000
1987		22,823	46,928	69,751	84,000
1988		152	65,587	65,739	93,000

1989	78,392	78,392	72,200
1990	90,744	90,744	73,400
1991	100,488	100,488	103,400
1992	90,857	90,857	87,400
1993	108,908	108,908	114,400
1994	107,335	107,335	109,300
1995	72,618	72,618	65,360
1996	51,263	51,263	54,810
1997	90,130	90,130	79,980
1998	125,098	125,098	124,730
1999	95,590	95,590	94,580
2000	73,080	73,080	94,960
2001	72,076	72,076	90,690
2002	51,937	51,937	53,490
2003	50,666	50,666	49,590
2004	63,934	63,934	65,660
2005	80,846	80,846	86,100
2006	71,976	71,976	81,300
2007	53,062	53,062	63,800
2008	52,500	52,500	53,590
2009	44,003	44,003	43,270
2010	76,860	76,860	77,150
2011	81,307	81,307	88,620
2012			108,440
Average (1977-2011)		101,913	117,775

Sources: 1964-85--Megrey (1988); 1986-90--Pacific Fishery Information Network (PacFIN), Pacific Marine Fisheries Commission. Domestic catches in 1986-90 were adjusted for discard as described in Hollowed et al. (1991). 1991-2011--NMFS Alaska Regional Office.

The catches for 2012 were 101,356 t in the GOA, in line with TAC specifications.
http://alaskafisheries.noaa.gov/2012/car110_goa.pdf

Table 10. Catch from the Eastern Bering Sea by area, the Aleutian Islands, the Donut Hole, and the Bogoslof Island area, 1979-2012 (2012 values preliminary). The southeast area refers to the EBS region east of 170 ° W; the Northwest is west of 170 ° W.

	Eastern Bering Sea			Aleutians	Donut Hole	Bogoslof I.
Year	Southeast	Northwest	Total			
1979	368,848	566,866	935,714	9,446		
1980	437,253	521,027	958,280	58,157		
1981	714,584	258,918	973,502	55,517		
1982	713,912	242,052	955,964	57,753		
1983	687,504	293,946	981,450	59,021		
1984	442,733	649,322	1,092,055	77,595	181,200	
1985	604,465	535,211	1,139,676	58,147	363,400	
1986	594,997	546,996	1,141,993	45,439	1,039,800	
1987	529,461	329,955	859,416	28,471	1,326,300	377,436
1988	931,812	296,909	1,228,721	41,203	1,395,900	87,813
1989	904,201	325,399	1,229,600	10,569	1,447,600	36,073
1990	640,511	814,682	1,455,193	79,025	917,400	151,672
1991	653,569	542,077	1,195,646	98,604	293,400	316,038
1992	830,560	559,771	1,390,331	52,352	10,000	241
1993	1,094,428	232,173	1,326,601	57,132	1,957	886

1994	1,152,573	176,777	1,329,350	58,659	556
1995	1,172,304	91,941	1,264,245	64,925	334
1996	1,086,840	105,938	1,192,778	29,062	499
1997	819,888	304,543	1,124,430	25,940	163
1998	965,767	135,399	1,101,165	23,822	136
1999	783,119	206,697	989,816	1,010	29
2000	839,175	293,532	1,132,707	1,244	29
2001	961,975	425,219	1,387,194	824	258
2002	1,159,730	320,465	1,480,195	1,156	1,042
2003	933,316	557,584	1,490,900	1,653	24
2004	1,089,999	390,544	1,480,543	1,150	0
2005	802,418	680,868	1,483,286	1,621	
2006	826,980	659,455	1,486,435	1,744	
2007	728,094	626,003	1,354,097	2,519	
2008	482,542	508,023	990,566	1,060	9
2009	356,258	451,688	807,947		73
2010	253,935	555,013	808,948		176
2011	445,239	726,483	1,171,722		173
2012	597,064	597,064	1,194,128		79
Average	753,119	427,310	1,180,429		
	64%	36%			

1979-1989 data are from Pacfin.
1990-2011 data are from NMFS Alaska Regional Office, and includes discards.
2012 EBS catch is preliminary

The catches for 2012 were 1,206,425 t in the BSAI, in line with TAC specifications.

Fishery independent data collection

Gulf of Alaska

Gulf of Alaska Bottom Trawl survey

Beginning in 1984, trawl surveys have been conducted every three years by the Alaska Fisheries Science Center (AFSC), with the frequency increased to every two years in 2001. A typical survey conducts 800 tows, with around 70% containing pollock. Mean CPUE from this survey is used to calculate biomass estimates. The 2011 bottom trawl survey conducted 670 tows, of which 492 contained pollock. 27,326 individuals were measured, the majority of which were also sexed. Age estimates from 1,646 individuals from the 2011 survey were included in the 2012 SAFE report. A scaled down GOA survey was conducted in 2013, and data should be available for the 2013 SAFE report.

Shelikof straight acoustic survey

The Shelikof straight acoustic survey has been conducted annually in almost every year since 1981 (excluding 1982, 1999 and 2011). The results of the survey are used to estimate biomass. Lengths and ages (using otoliths) are both sampled, though only age composition estimates are used in the stock assessment process. A new Shelikof Strait acoustic survey was conducted in 2012. The 2012 Shelikof Strait acoustic estimate declined 22% from the 2010 estimate (no survey was conducted in winter of 2011). The 2012 pollock biomass estimates along the GOA shelf break in the vicinity of Chirikof Island was the highest observed since 2008. The egg production index method of biomass estimation was removed from the model illustrated in the 2012 SAFE report.

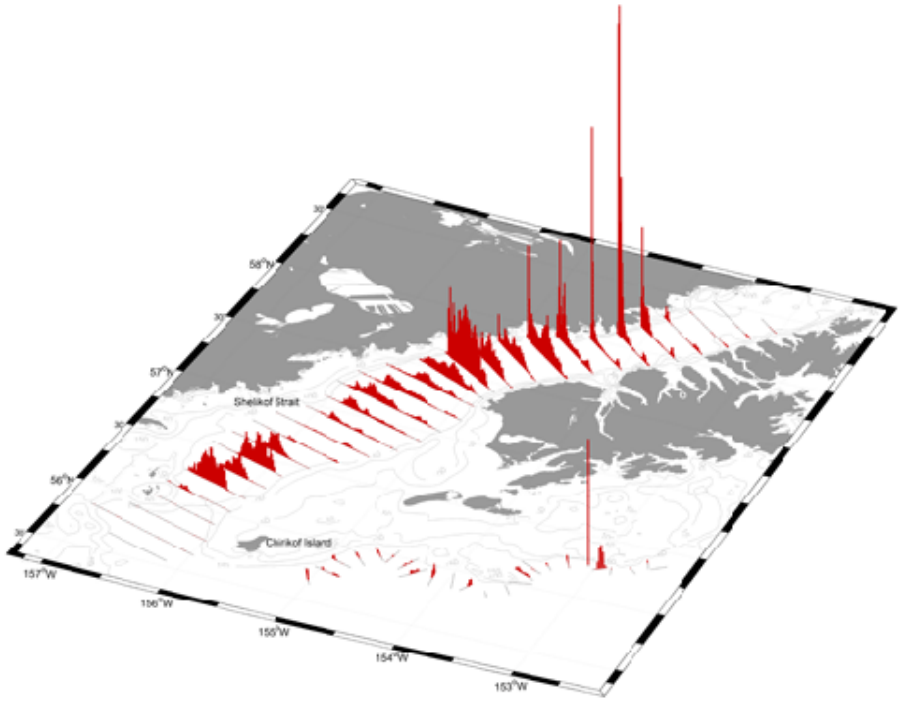


Figure 3. Acoustic backscattering (sA) attributed to walleye pollock (vertical lines) along transects during the March 2012 acoustic-trawl surveys of Shelikof Strait and along the Gulf of Alaska shelf break from Barnabas Trough to Chirikof Island. The largest value shown in this figure represents 51,500 sA.

Winter acoustic pollock survey

The winter acoustic trawl survey is conducted in the GOA biennially, being conducted in alternate years in the EBS region. 2012 was an off year for the GOA winter acoustic survey.

ADFG crab and groundfish trawl survey

Conducted annually since 1987, the ADFG nearshore trawl survey is designed to monitor crab populations but also samples some fish species, including pollock. The survey is designed to cover a fixed number of stations between Kodiak Island and Unimak Pass, and averages around 360 tows. This survey produces biomass estimates, age composition, and size frequency data for pollock that are used in the assessment. The ADFG crab/groundfish survey was conducted in 2012, producing a biomass estimate increased by 71% from the 2011 estimate.

Table 11. Biomass estimates (t) of walleye pollock from NMFS acoustic surveys in Shelikof Strait, NMFS bottom trawl surveys (west of 140 W. long.), egg production surveys in Shelikof Strait, and ADFG crab/groundfish trawl surveys. For models where age-1 fish were not included, the Shelikof Strait acoustic survey estimates in 1995, 2000, 2005 and 2008 reduced by 114,200, 57,300, 18,100 t and 19,090 t respectively. An adjustment of +1.05% was made to the AFSC bottom trawl biomass time series to account for unsurveyed biomass in Prince William Sound. In 2001, when the NMFS bottom trawl survey did not extend east of 147 ° W longitude, an expansion factor of 2.7% derived from previous surveys was used for West Yakutat.

	Shelikof Strait acoustic survey					
	R/V Miller Freeman		R/V Oscar	NMFS bottom trawl west of	Shelikof Strait egg	ADFG crab/groundfish
Year	Biosonics	EK500	Dyson	140° W lon.	production	survey
1981	2,785,755				1,788,908	
1982						
1983	2,278,172					
1984	1,757,168			720,548		
1985	1,175,823				768,419	
1986	585,755				375,907	
1987				732,660	484,455	
1988	301,709				504,418	
1989	290,461				433,894	214,434
1990	374,731			825,609	381,475	114,451
1991	380,331				370,000	
1992	580,000	713,429			616,000	127,359
1993	295,785	435,753		755,786		132,849
1994		492,593				103,420
1995		763,612				
1996		777,172		666,521		122,477
1997		583,017				93,728
1998		504,774				81,215
1999				607,409		53,587
2000		448,638				102,871
2001		432,749		219,072		86,967
2002		256,743				96,237
2003		317,269		398,469		66,989
2004		330,753				99,358
2005		356,117		358,017		79,089
2006		293,609				69,044
2007		180,881		282,356		76,674
2008			208,032			83,476
2009			265,971	669,505		145,438
2010			429,730			124,110
2011				667,131		100,839
2012			335,836			172,007

Eastern Bering Sea

Eastern Bering Sea Continental shelf bottom trawl survey

Conducted annually by the AFSC since 1971, and with consistent gear since 1982, the 2012 shelf trawl survey conducted 385 bottom trawls. For pollock, the survey collected 35,782 length measurements, 1,797 age structures and 712 stomach samples, in addition to CPUE and total biomass estimates.

The 2012 biomass estimate was 3.49 million t, an increase of 11% from the 2011 value (3.11 million t) and 26% below the mean value for this survey (4.73 million t).

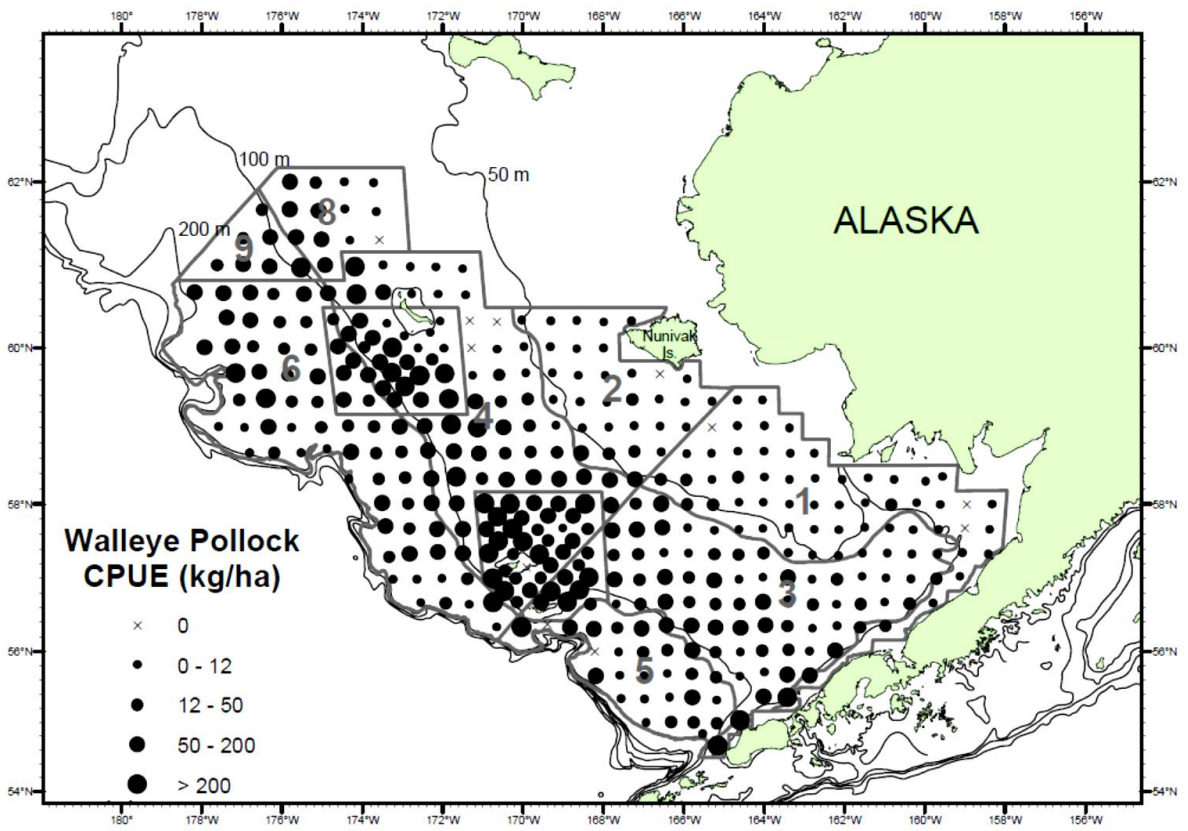


Figure 4. Catch rates (kg/ha) of walleye pollock during the 2012 Eastern Bering Sea Continental Shelf Bottom Trawl Survey of Groundfish and Invertebrate Resources.
http://www.afsc.noaa.gov/RACE/surveys/cruise_archives/cruises2012/results_AlaskaKnight_Aldebaran-2012.pdf

Summer acoustic pollock survey

The summer acoustic trawl survey is normally conducted in the EBS biennially, being conducted in alternate years from the GOA region. From 2006-2010 the survey was conducted annually due to additional funding for BSIERP research. From the 2012 survey the pollock biomass in the U.S. exclusive economic zone (EEZ) was distributed between the Pribilof Islands and Cape Navarin, between roughly the 80 m and 200 m isobaths. Estimated pollock abundance in midwater (between 16 m from the surface and 3 m off bottom) in the U.S. EEZ portion of the Bering Sea shelf was 1.843 million metric tons (t), lower than in 2010 (2.323 million t) but higher than in 2009 or 2008 (0.924 million t, and 0.997 million t, respectively). Pollock biomass east of 170° W was 0.279 million t, the predominant length mode was 47-48 cm, and most ages ranged between 4 and 7 years. In the U.S. waters west of 170° W, pollock biomass was 1.563 million t (65.4% of total shelf-wide biomass), and dominant modal lengths were 23, 38, and 30 cm, corresponding to pollock aged 2, 4, and 3 years, respectively. http://www.afsc.noaa.gov/Publications/ProcRpt/PR2013-02.pdf

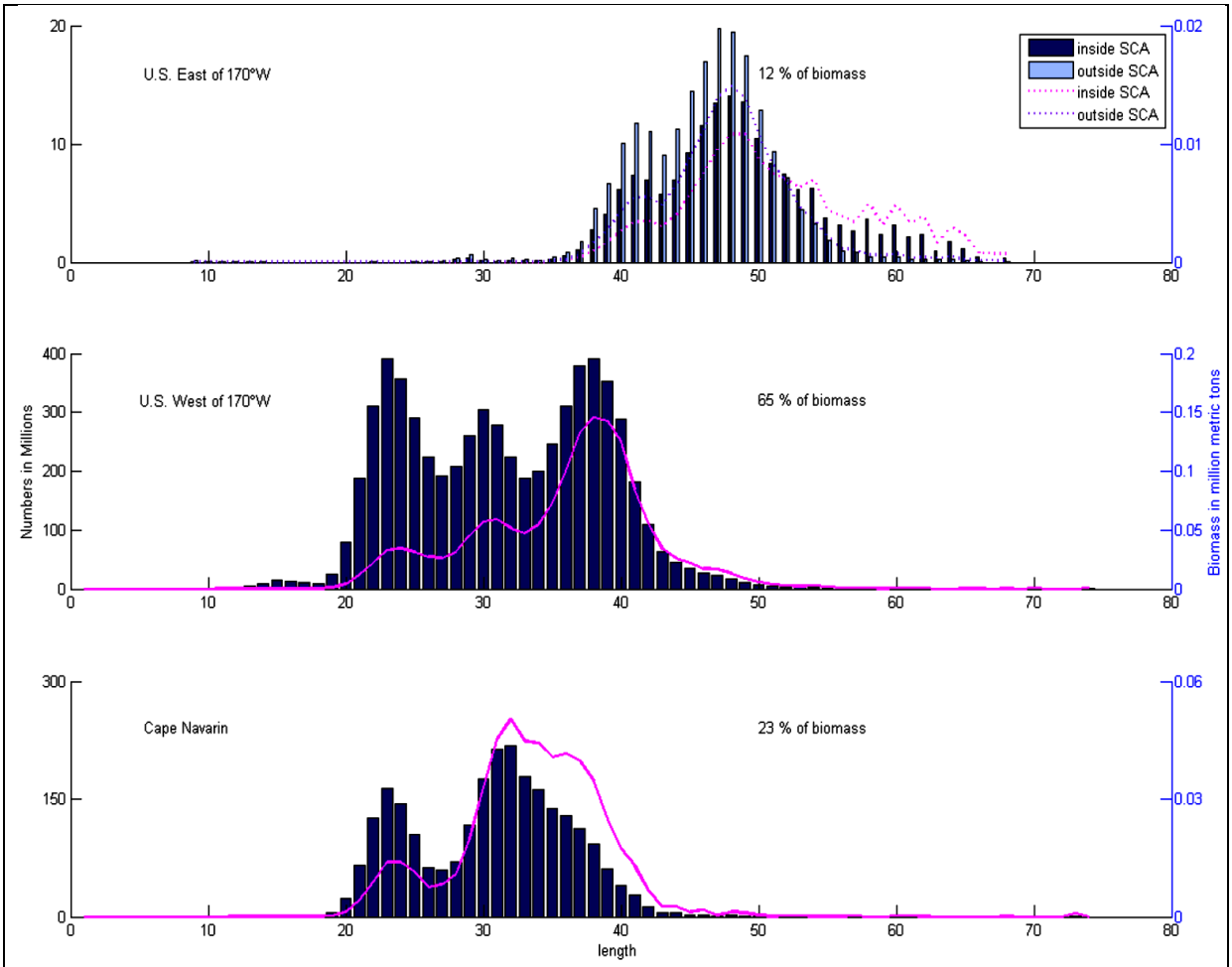


Figure 5. Population numbers (histogram bars) and biomass (lines) at length (cm) estimated for walleye pollock between 16 m from the surface and 3 m off the bottom from the summer 2012 eastern Bering Sea shelf acoustic-trawl survey in three geographic regions.

Vessel-of-opportunity acoustic surveys (AVO)

Acoustic data collected from commercial fishing vessels used for the continental shelf bottom trawl survey were analyzed to determine the feasibility of using the trawl survey acoustic data to provide a new midwater pollock index. Analysis of four years of summer acoustic survey data (1999, 2000, 2002, and 2004) identified a suitable index area to track midwater pollock abundance. Since 2006, commercial fishing vessels chartered for the continental shelf bottom trawl survey have collected 38 kHz backscatter in this area. In 2012, the report analyzing the data for 2010-2011 was published. The AVO index was used in the Bering Sea walleye pollock stock assessment for the first time in 2010 and was fully incorporated in 2011. Comparison of 2010 AVO and AT survey results provided additional confirmation that the AVO index is a good proxy for the abundance and distribution of midwater walleye pollock. http://www.afsc.noaa.gov/Publications/ProcRpt/PR2012-04.pdf

Russian survey data

Survey data from the Russian pollock fishery region was made available, including biomass estimates and size compositions. Although not directly comparable with Alaska surveys, examination of the data revealed consistencies with the patterns of strong years classes identified in US waters. The AFSC summer acoustic pollock survey also covers a portion of the WBS in the Russian EEZ.

Bering-Aleutian Salmon International Survey (BASIS)

Since 2006, BASIS survey scientists from the North Pacific Anadromous Fish Commission have collected acoustic backscatter both in and outside of standard survey areas, and Phase II will continue this research through 2013. Surface and mid-water trawls have been conducted in recent years to provide information on ecosystem wide changes with particular reference to pelagic ecosystems. The research has focused on young-of-year pollock and juvenile salmon in particular.
http://www.npafc.org/new/publications/Documents/PDF%202009/1164(BASIS-II-Plan).pdf

Bogoslof Island

The winter 2012 Bogoslof pollock Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) acoustic-trawl (AT) survey found 67,500 t compared with 110,000 t from the 2009 survey. The Bogoslof fishery primarily targeted winter spawning aggregations but has been closed to pollock fishing since 1992. Pollock bycatch levels have increased in this area since 2008, with 2011 topping 1,185 t.

Table 12. Estimated retained, discarded, and total pollock catch (t) from the Bogoslof region. Source: NMFS Regional office Blend database and catch accounting system.

Year	Discarded	Retained	Total
1991	20,327	295,711	316,038
1992	240	1	241
1993	308	578	886
1994	11	545	556
1995	267	66	334
1996	7	492	499
1997	13	150	163
1998	3	133	136
1999	11	18	29
2000	20	10	29
2001	28	231	258
2002	12	1,031	1,042
2003	19	5	24
2004	0.01		0.01
2005	0.016	0.002	0.02
2006	0.006	0.006	0.01
2007	-	0.03	0.03
2008	0.003	9.29	9.29
2009	6	67	73
2010	53	123	176
2011	23	1,185	1,208
2012	5	74	79

Aleutian Islands

As of October 9, 2012, 0 t had been taken in the directed fishery. In 2010 and 2011, 1,235 and 1,208 t were harvested as bycatch in other fisheries. In 2012, 961 t had been taken as bycatch in other fisheries as of October 9. Since 2005 the TAC has been constrained to 19,000 t or the ABC, whichever is lower, by statute. It should be noted here that the 2012 summer bottom trawl estimate was the lowest on record with only 44,281 t estimated for the area west of 170° w longitude.

PWS surveys

Pollock in Prince William Sound is managed by the ADFG using a Tier 5 stock approach similar to the NPFMC, using biomass estimates derived from occasional surveys, sampling and landings data. The following link (http://www.sf.adfg.state.ak.us/FedAidPDFs/sp08-12.pdf) is a report assessing the stock and the procedure in 2008, the last time a formal document was completed. The report indicates that biomass is estimated by bottom trawl surveys in summer and a winter hydroacoustic survey when such a winter survey is completed. The ADFG PWS Assistant Area Management Biologist, Maria Wessel, has indicated that the 2008 document still reflects the current procedures. She has additionally indicated that NOAA has brought their winter acoustical survey vessel into PWS in 2011 and 2013 to assist ADFG in their survey. The 2012 GHL was set at 6.1 million pounds (2,770 mt) and the 2013 GHL was set at 5.78 million pounds.

Socio-economic data collection

The Economic and Social Sciences Research Program within NMFS's Resource Ecology and Fisheries Management (REFM) Division provides economic and socio-cultural information that assists NMFS in meeting its stewardship programs. The REFM division presents an annual Economic Status Report of the Groundfish fisheries in Alaska http://www.afsc.noaa.gov/REFM/docs/2013/economic.pdf. The figures and tables in the report provide estimates of total groundfish catch, groundfish discards and discard rates, prohibited species catch (PSC) and PSC rates, the ex-vessel value of the groundfish catch, the ex-vessel value of the catch in other Alaska fisheries, the gross product value of the resulting groundfish seafood products, the number and sizes of vessels that participated in the groundfish fisheries off Alaska, vessel activity, and employment on at-sea processors. The report contains analysis and comment of the performance of a range of indices for different sectors of the North Pacific fisheries relate changes in value, price, and quantity, across species, product and gear types, to aggregate changes in the market. 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.

Community Profiles for North Pacific Fisheries – Alaska

In 2005, the AFSC compiled baseline socioeconomic information about 136 Alaska communities most involved in commercial fisheries, in the first edition of *Community Profiles for North Pacific Fisheries – Alaska* (NOAA-TM-AFSC-160). Between 2010 and 2011, AFSC went through the process of updating the profiles (NOAA-TM-AFSC-230). A total of 195 communities have now been profiled. The new profiles add a significant amount of new information to help provide a better understanding of each community's reliance on fishing. The profiles include information collected from communities in the Alaska Community Survey, which was conducted during summer 2011, and the Processor Profiles Survey, which was conducted in fall 2011.

Evidence

http://www.afsc.noaa.gov/REFM/Stocks/assessments.htm
http://www.afsc.noaa.gov/REFM/docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/BOGpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOApollock.pdf
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-238.pdf

http://www.afsc.noaa.gov/Publications/ProcRpt/PR2012-01.pdf
http://asadl.org/jasa/resource/1/jasman/v129/i4/p2695_s1?bypassSSO=1
http://www.afsc.noaa.gov/ABL/MESA/archives/mesa_occ_basis.htm
http://www.sf.adfg.state.ak.us/FedAidPDFs/sp08-12.pdf
http://www.afsc.noaa.gov/REFM/Socioeconomics/Projects/CPU.php
http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-230.pdf

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

Guided by MSA standards, and other legal requirements, the NMFS has a well-established institutional framework for research developed within the AFSC. Scientists at the AFSC conduct research and stock assessments on pollock in Alaska each year, producing annual Stock Assessment and Fishery Evaluation (SAFE) reports for the federally managed EBS, GOA, Aleutian Islands and Bogoslof pollock stocks. These SAFE reports summarize the best-available science, including the fishery dependent and independent data, document stock status, significant trends or changes in the resource, marine ecosystems, and fishery over time, assess the relative success of existing state and Federal fishery management programs, and produce recommendations for annual quotas and other fishery management measures. The annual stock assessments are peer reviewed by experts and recommendations are made annually to improve the assessments.

The *National Standard Guidelines for Fishery Management Plans* published by the NMFS require that a stock assessment and fishery evaluation (SAFE) report be prepared and reviewed annually for each fishery management plan (FMP). To satisfy this requirement, an annual groundfish SAFE is published for both the BSAI and GOA groundfish fisheries. The SAFE reports summarize the best available scientific information concerning the past, present, and possible future condition of the groundfish stocks and their associated ecosystems. The information contained within the SAFE reports forms the basis for Council decisions on annual harvest levels, technical measures and other management actions.

The SAFE 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 reviews by the Center for Independent Experts (CIE). The recommendations from previous meetings are highlighted in the introductions of the assessment SAFE documents and progress on recommended research is noted accordingly. The most recent CIE review for the GOA pollock assessment was in July of 2012, with several of the recommendations incorporated into the 2012 SAFE.
http://www.afsc.noaa.gov/REFM/stocks/plan_team/Response%20to%202012%20CIE%20review%20of%20GOA%20pollock.pdf

The groundfish SAFE reports are divided into sections covering individual stocks. In the case of the GOA, pollock throughout the region is managed and assessed as a single stock (although there is a second, poorly-understood stock in the Southeast, which has no directed pollock fishery, see GOA section below). In the BSAI, the species is managed as three separate stocks: Eastern Bering Sea (EBS), Aleutian Islands (AI) and Bogoslof Island (BI). The input data used to inform the models, and to

test their predictions, are discussed in detail under fundamental clause 4, above.

Gulf of Alaska

An age-structured model covering the period from 1964 to 2012 is used to assess Gulf of Alaska pollock, and includes individuals from age 1 to age 10. Recommendations from the CIE review that were incorporated into the 2012 model include:

1) the model includes ages 1-10 rather than ages 2-10 as in previous assessments;
2) an accumulator age was added to initial age composition and stronger equilibrium assumptions were used to initialize the model;
3) mean unbiased log-normal likelihoods are used for survey biomass indices;
4) the historical trawl data (pre-1984) was removed from the model;
5) the egg production index (1981-1992) was removed from the model;
6) six selectivity blocks were used for fishery selectivity rather than allowing selectivity parameters to vary annually with a random walk;
7) reduced weights (input sample sizes) were used for the fishery age composition data; and finally,
8) the model begins in 1964 rather than 1961.

Population dynamics are modeled using standard formulations for mortality and fishery catch and the model remains similar to the model used for assessments in 1999-2011.

Summary of changes in assessment inputs as reported in the December 2012 GOA pollock SAFE

Fishery: 2011 total catch and catch at age.
NMFS bottom trawl survey: 2011 age composition.
ADFG crab/groundfish trawl survey: 2012 biomass and length composition.
The pre-1984 trawl survey data were removed from the model.
The egg production index (1981-1992) was removed from the model.

Results

The base model projection of spawning biomass in 2013 is 259,843 t, which is 35.1% of unfished spawning biomass (based on average post-1977 recruitment) and below *B40%* (297,000 t), thereby placing Gulf of Alaska pollock in sub-tier "b" of Tier 3. New Shelikof Strait acoustic surveys and ADFG crab/groundfish surveys were conducted in 2012. The 2012 Shelikof Strait acoustic estimate declined 22% from the 2010 estimate (no survey was conducted in winter of 2011). The ADFG crab/groundfish survey biomass estimate increased by 71% from the 2011 estimate. The estimated abundance of mature fish in 2013 is projected to be nearly the same as in 2012, and is projected to gradually decrease over the next five years.

The author's 2013 ABC recommendation for pollock in the Gulf of Alaska west of 140° W lon. (W/C/WYK) is 113,586 t, an increase of 5% from the 2012 ABC. This recommendation is based on a more conservative alternative to the maximum permissible *FABC* introduced in the 2001 SAFE applied to the base model. The OFL in 2013 is 150,817 t. In 2014, the recommended ABC and OFL are 104,157 t and 138,610 t, respectively.

An exempted fishing permit (EFP) has been proposed to evaluate the effect of salmon excluder devices in the pollock fishery. Projected pollock catches under the EFP will be 2,304 t in 2013 and 2,304 t in 2014 (Jeff Hartman, NMFS Alaska Regional Office, pers. comm. Oct. 22, 2012). SAFE authors followed the Gulf of Alaska Plan Team recommendation, and accounted for the EFP catches

in a projection model where the EFP catches were removed from the population at the start of year in 2013 and 2014. This resulted in a 2013 ABC of 113,099 t (487 t difference) and a 2014 ABC of 103,339 (818 t difference).

Table 13. Summary of stock status from the GOA Pollock SAFE 2012.

Quantity/Status	As estimated or specified *last* year for 2012	2013	As estimated or specified *this* year for 2013	2014
M (natural mortality rate)	0.3	0.3	0.3	0.3
Tier	3b	3b	3b	3b
Projected total (age 3+) biomass (t)	863,840	926,890	981,791	885,420
Female spawning biomass (t)				
Projected	227,723	232,632	259,843	247,699
$B_{100\%}$	678,000	678,000	741,000	741,000
$B_{40\%}$	271,000	271,000	297,000	297,000
$B_{35\%}$	237,000	237,000	259,000	259,000
F_{OFL}	0.19	0.19	0.20	0.18
$maxF_{ABC}$	0.17	0.17	0.18	0.16
F_{ABC}	0.14	0.15	0.15	0.14
OFL (t)	143,720	155,400	150,817	138,610
maxABC (t)	125,560	135,790	131,630	115,977
ABC (t)	108,440	117,330	113,586	104,157
Status	As determined *last* year for 2010	2011	As determined *this* year for 2011	2012
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

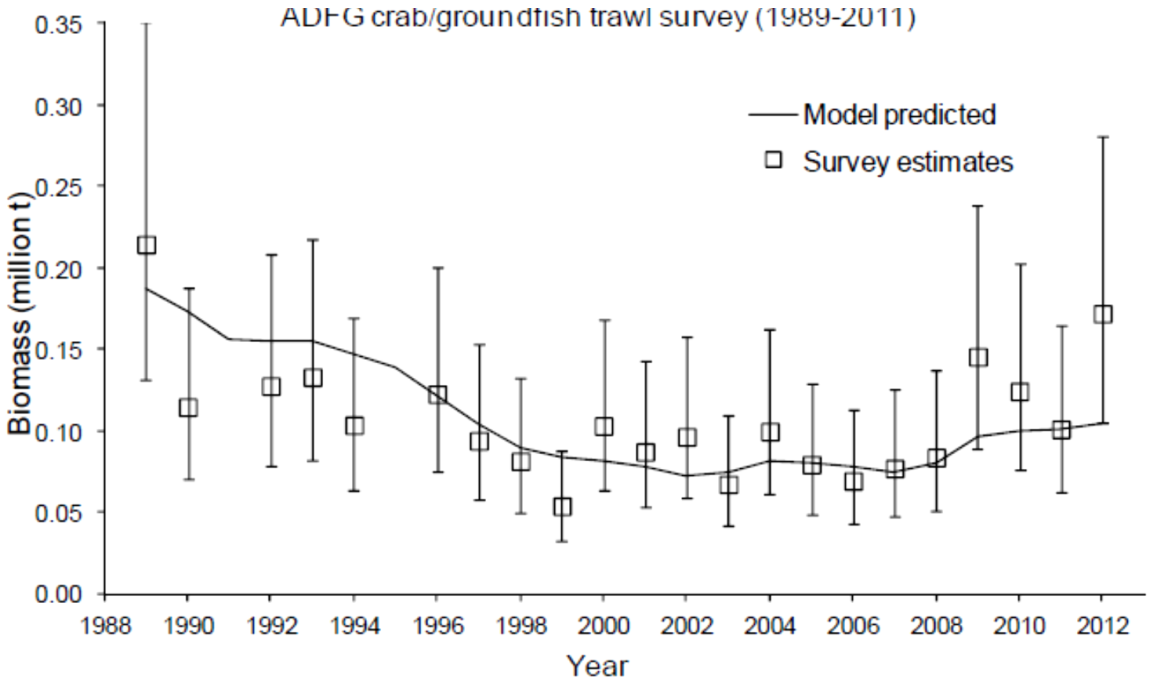


Figure 6. Biomass as predicted by the GOA stock assessment model and observed survey biomass for ADFG crab/groundfish survey (should read 1989-2012). Error bars indicate plus and minus two standard deviations.

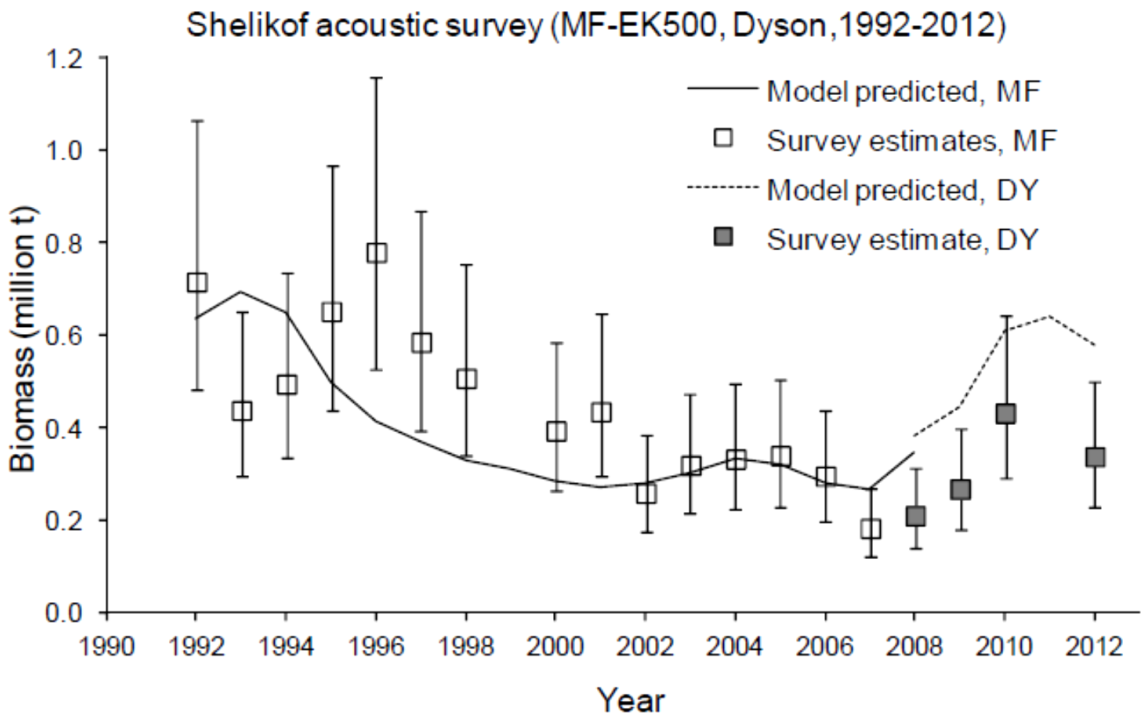


Figure 7. Model predicted and observed survey biomass for the Shelikof Strait acoustic survey. The Shelikof acoustic survey is modeled with two catchability periods corresponding to the most recent acoustic system used on the *R/V Miller Freeman* (MF), with an additional catchability period for the *R/V Oscar Dyson* (DY) in 2008-2012. Error bars indicate plus and minus two standard deviations.

From the 2012 GOA SAFE report: http://www.afsc.noaa.gov/REFM/docs/2012/GOApollock.pdf

Southeast Alaska Pollock

The pollock stock east of 140° W is poorly understood and not subject to a directed fishery; annual landings since 2000 have averaged 1 t, primarily as a result of the trawling ban in the region. The GOA SAFE assessment categorizes the stock as tier 5.

The ABC recommendations for 2013 and 2014 are 10,774 t and the OFL recommendation for 2013 and 2014 is 14,366 t. These recommendations are based on the estimated biomass in the southeast Alaska from the 2011 NMFS bottom trawl survey and are unchanged from last year.

Eastern Bering Sea

The EBS stock is assessed using a statistical age-structured assessment model applied over the period 1964-2012, an approach which has been used since 1996. The 2012 assessment saw no major changes in methodology.

Summary of major changes as reported in the Dec 2012 EBS pollock SAFE

The primary changes include:

• The 2012 NMFS summer bottom-trawl survey (BTS) abundance at age estimates are included.
• The 2012 NMFS summer acoustic-trawl (AT) survey estimated abundance-at-age are included (using age samples primarily from the bottom-trawl survey).

• Observer data for catch-at-age and average weight-at-age from the 2011 fishery was finalized and included.
• Preliminary 2012 fishery catch-at-age data was estimated using BTS survey age-length keys
• Total catch as reported by NMFS Alaska Regional office was updated and included through 2012.

Results

The estimated increase in female spawning stock biomass is moderated somewhat from the 2011 assessment though female spawning biomass is projected to have been above *Bmsy* level in 2012 and is expected to continue increasing. Similar to the 2011 assessment, the maximum permissible Tier 1a ABC remains high since positive signs for incoming year classes continue (albeit moderated somewhat). The available data indicate that the spawning biomass for 2012 is projected to be slightly below the level expected from last year's assessment. In response to Plan Team requests, a wider range of indicators relative to the harvest policy was evaluated. Based on these, and other qualitative uncertainties, an ABC equal to last year's is recommended (1,200,000 t) which is well below the maximum permissible (Tier 1a) value 2.3 million t. The Tier 1a overfishing level (OFL) is estimated to be 2,549,000 t. See the table below for a full summary of the 2012 SAFE assessment conclusions.

Table 14. Summary results for EBS pollock.

	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2012	2013	2013	2014
M (natural mortality rate, ages 3+)	0.3	0.3	0.3	0.3
Tier	1a	1a	1a	1a
Projected total (age 3+) biomass (t)	8,341,000 t	8,690,000 t	8,138,000 t	8,082,000 t
Female spawning biomass (t)				
Projected	2,379,000 t	2,534,000 t	2,580,000 t	2,522,000 t
B_0	5,329,000 t	5,329,000 t	5,377,000 t	5,377,000 t
B_{MSY}	2,034,000 t	2,034,000 t	2,114,000 t	2,114,000 t
F_{OFL}	0.6	0.6	0.543	0.543
$maxF_{ABC}$	0.533	0.533	0.491	0.491
F_{ABC}	0.296	0.296	0.26	0.32
OFL (t)	2,474,000 t	2,842,000 t	2,549,000 t	2,726,000 t
maxABC (t)	2,198,000 t	2,526,000 t	2,306,000 t	2,466,000 t
ABC (t)	1,220,000 t	1,360,000 t	1,200,000 t	1,547,000 t
	As determined *last* year for:		As determined *this* year for:	
Status	2010	2011	2011	2012
Overfishing	No	n/a	No	n/a
Overfished	n/a	No	n/a	No
Approaching overfished	n/a	No	n/a	No

http://www.afsc.noaa.gov/REFM/docs/2012/EBSpollock.pdf

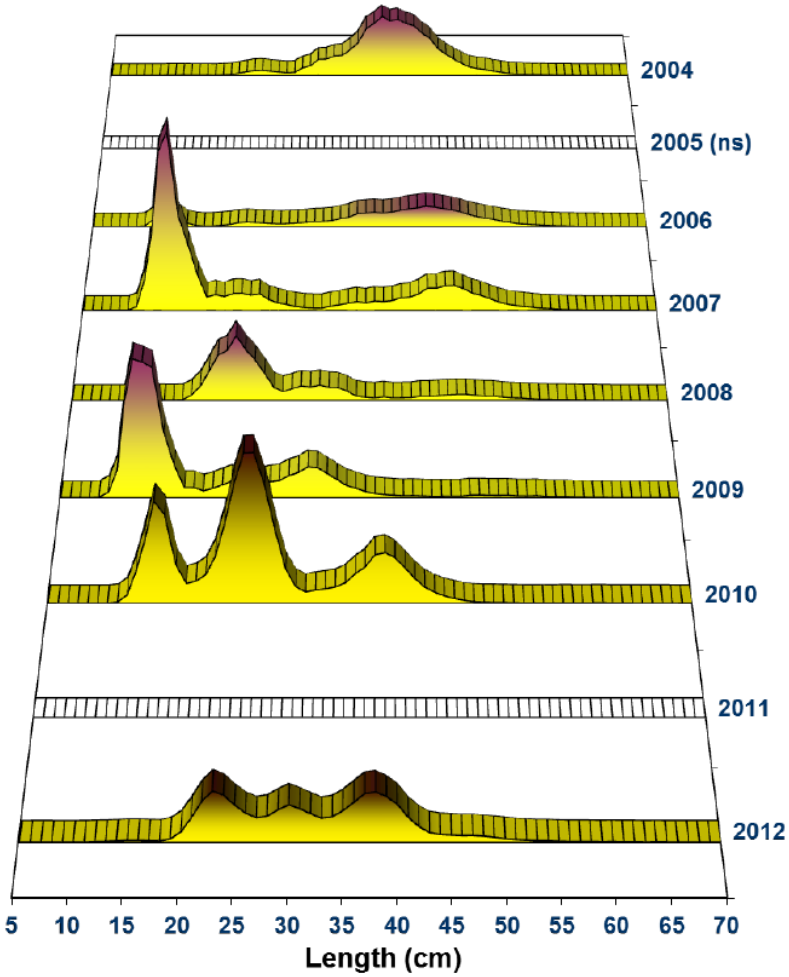


Figure 8. Acoustic-trawl survey relative abundances at length for EBS pollock, 2004-2012. Vertical scale is equal for all years and is relative to numbers of fish.

Aleutian Islands

In recent years the directed AI pollock fishery has only been open since 2005, and annual landings have been around 1,000-2,000 t since that time. The first detailed age-structured stock assessment for the stock was instigated in 2003 and has been further developed since.

Summary of major changes as reported in the Dec 2012 AI pollock SAFE

The primary changes include:

- Inclusion of the 2012 pollock catch estimate
- Inclusion of the 2012 summer bottom trawl survey biomass estimate
- Catches for 1978 to 2012 were updated to latest estimates from the catch accounting system (CAS)
- A generalized additive model was used for estimating year specific weight-at-age data

The 2012 assessment continues with the same assessment model presented last year. The only differences in the model is a change in how the fishery age composition sample sizes were determined and a new set of GAMs for estimating the year specific weight-at-age. In addition authors included the 2012 summer bottom trawl survey estimate and 2012 fishery catch estimate. It should be noted here that the 2012 summer bottom trawl estimate was the lowest on record with only 44,281 t estimated for the area west of 170° w longitude.

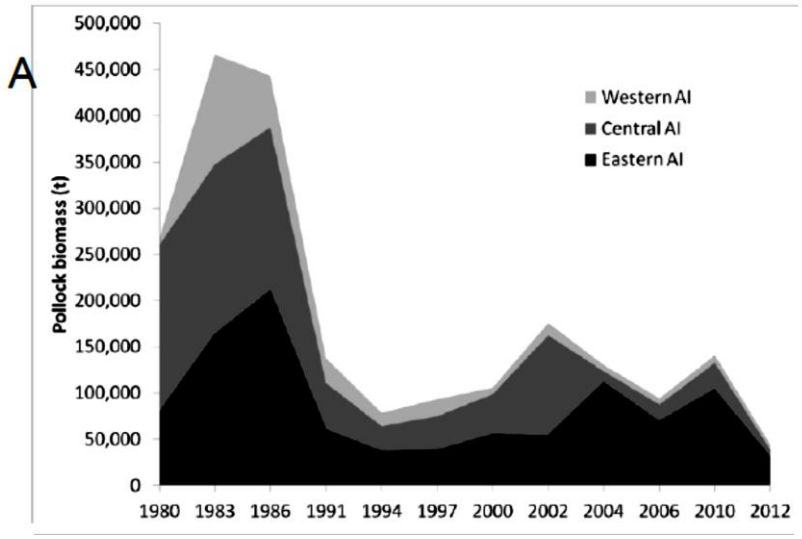
Results

The maximum permissible ABC for 2013 and 2014 (assuming the five year average catch in 2013) under Tier 3b are 37,295 t and 39,818 t, respectively. The OFL for 2013 and 2014 under Tier 3b are 45,588 t and 48,596 t respectively. Due to the historic low survey biomass estimate of 44,281 t the Tier 5 values were much lower this year than last with a Tier 5 ABC for 2013 and 2014 assuming M = 0.2 would be 6,642 t and OFL would be 8,856 t. See the table below for a full summary of the 2012 SAFE assessment conclusions.

Table 15. Summary of results from the 2012 AI pollock SAFE.

Quantity	As estimated or *specified last* year for: 2012	2013	As estimated or *recommended this* year for: 2013	2014*
M (natural mortality rate)	0.19		0.18	
Tier	3b		3b	
Projected total (age 2+) biomass (t)	250,905	285,228	265,591	292,824
Female spawning biomass (t)				
Projected	70,894	73,033	85,240	86,168
$B_{100\%}$	234,074		249,513	
$B_{40\%}$	93,630		99,805	
$B_{35\%}$	81,926		87,330	
F_{OFL}	0.33	0.33	0.34	0.34
$maxF_{ABC}$	0.27	0.27	0.27	0.28
F_{ABC}	0.27	0.27	0.27	0.28
OFL (t)	39,607	39,607	45,588	48,596
maxABC (t)	32,454	32,454	37,295	39,818
ABC (t)	32,454	32,454	37,295	39,818
Status	As determined *last* year for: 2010	2011	As determined *this* year for: 2011	2012
Overfishing	no	n/a	no	n/a
Overfished	n/a	no	n/a	no
Approaching overfished	n/a	no	n/a	no

* After 2013 catch of the five year average catch of 1,614 t. If the 2013 catch is max TAC of 19,000 t the 2014 projected total age 2+ biomass would be 276,980 t, the female spawning biomass would be **78,786** t, the maximum permissible ABC would be 33,827 t and the 2014 OFL would be 41,410 t. In which case the 2014 F_{OFL} would be 0.32 and the max F_{ABC} would be 0.26.



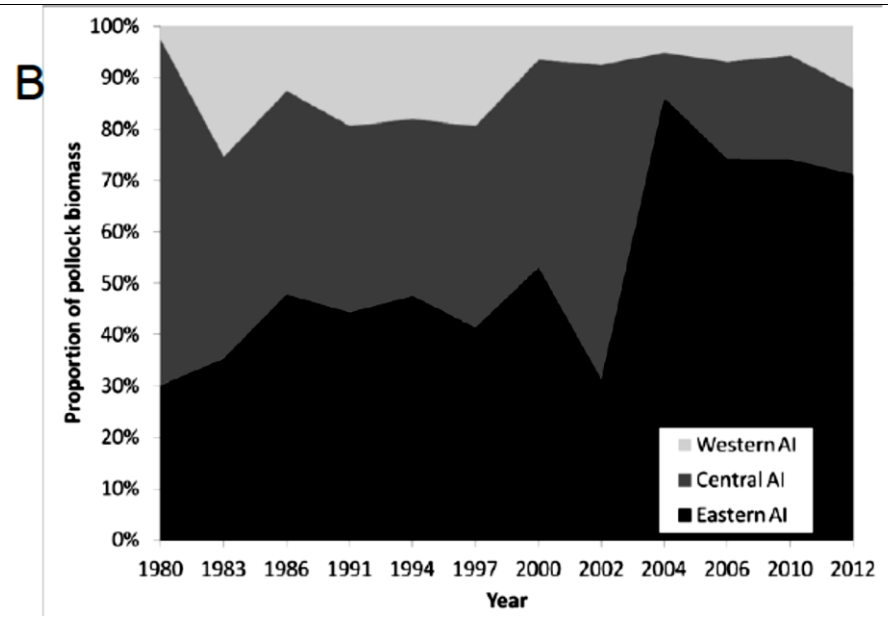


Figure 9. Aleutian Islands bottom trawl survey pollock biomass (A; top) and proportion of biomass (B; bottom) for the three Aleutian Island management regions.
http://www.afsc.noaa.gov/REFM/Docs/2012/AIpollock.pdf

Bogoslof Region

The Bogoslof region stock (also known as the Aleutian Basin stock) has had no directed pollock fishery since 1992, although the species is caught as bycatch in other fisheries in the area. Total bycatch landings are low, with 79 t caught in 2012. As in 2011, the 2012 stock assessment was a strictly survey-based management approach. In lieu of new information becoming available on the exchange of Pollock between the Bogoslof and central BS; the use of a straight-forward Tier 5 calculation, the maximum permissible ABC value would be 10,059 t (assuming M = 0.2 and $FABC$ =0.75M=0.15)): ABC = B_{2012} x M x 0.75 = 67,063 x 0.2 x 0.75 = 10,059 t. The winter 2012 Bogoslof pollock acoustic-trawl (AT) survey found 67,500 t compared with 110,000 t from the 2009 survey. The following summarizes the 2013 ABC and OFL levels by approaches that include the SSC's harvest rule and Tier 5 values using different levels of natural mortality (recommendations in bold; these values would also apply for 2014). The 2012 SAFE report recommendations for the Bogoslof Island pollock fishery are summarized in the table below.

Quantity	As estimated or *specified last* year for: 2012	2013	As estimated or *recommended this* year for: 2013	2014
M (natural mortality rate)	0.2	0.2	0.2	0.2
Tier	5	5	5	5
Biomass (t)	110,000	110,000	67,063	67,063
F_{OFL}	0.200	0.200	0.200	0.200
$maxF_{ABC}$	0.150	0.150	0.150	0.150
F_{ABC}	0.150	0.150	0.150	0.150
OFL (t)	22,000	22,000	13,413	13,413
maxABC (t)	16,500	16,500	10,059	10,059
ABC (t)	16,500	16,500	10,059	10,059
Status	As determined *last* year for: 2010	2011	As determined *this* year for: 2011	2012
Overfishing	No	n/a	No	n/a

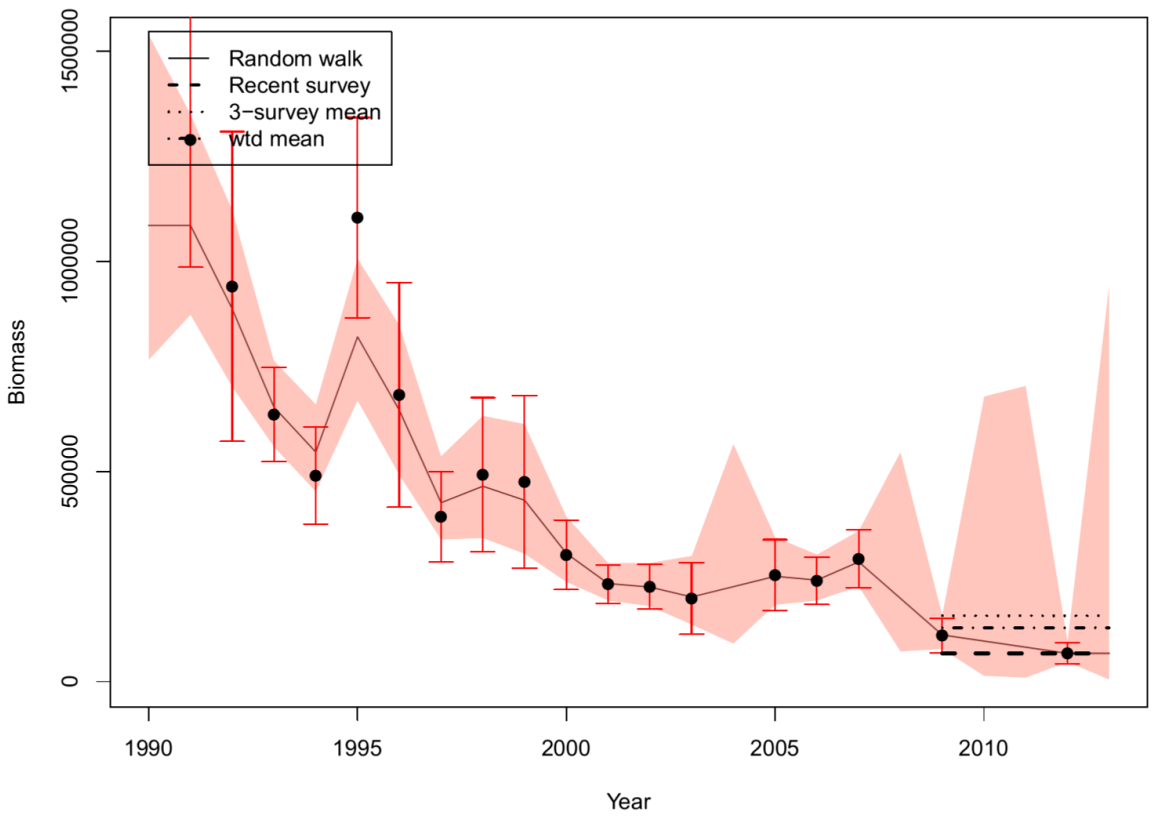


Figure 10. Bogoslof Island pollock survey estimates fitted to a process error model for averaging recruitment. The shade represents the approximate 90% confidence interval from the model.

http://www.afsc.noaa.gov/REFM/docs/2012/BOGpollock.pdf

State-managed fisheries

Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. In parallel fisheries quotas are set as a percentage of the broader regional TAC, and so parallel-fishery-specific stock assessments are not conducted. The state-managed pollock fishery in Prince William Sound is managed using a harvest rate strategy, where the Guideline Harvest Level is the product of the biomass estimate, instantaneous natural mortality rate (0.3) and a precautionary factor of 0.75. Biomass is estimated from the ADFG conducted bottom trawl and hydroacoustic surveys and recently with collaboration of the NMFS vessel. Although the stock is assessed independently, pollock catches in the PWS fishery are included in GOA stock assessment models, and the state-set PWS GHL is subtracted from the ABC of the broader GOA stock.

Evidence

http://www.afsc.noaa.gov/refm/stocks/assessments.htm
http://www.afsc.noaa.gov/REFM/docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/BOGpollock.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/GOApollock.pdf
http://www.adfg.alaska.gov/index.cfm?adfg=walleyepollock.management

C. The Precautionary Approach

6.	**The current state of the stock shall be defined in relation to reference points or relevant proxies or verifiable substitutes allowing for effective management objectives and targets. Remedial actions shall be available and taken where reference point or other suitable proxies are approached or exceeded.** ***FAO CCRF 7.5.2/7.5.3*** ***Eco 29.2/29.2bis/30-30.2***
Evidence adequacy rating:	☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

The NPFMC harvest control system is a complex and multi-faceted suite of management measures to address issues related to sustainability, legislative mandates, and quality of information. The tier system specifies the maximum permissible Allowable Biological Catch (ABC) and of the Overfishing Level (OFL) for each stock in the complex (usually individual species but sometimes species groups). The EBS pollock stock in Alaska is categorized as tier 1a while the GOA pollock and AI stocks are categorized as tier 3b. For Tier 1 stocks, reliable estimates are available of B and B_{MSY}, and a reliable probability density function is available for F_{MSY}. For Tier 3 stocks, the spawner-recruit relationship is uncertain, so that MSY cannot be estimated with confidence. Hence, a surrogate based on $F_{40\%}$ is used, following findings in the scientific literature in the 1990s. For Tier 3 stocks, the MSY proxy level is defined as $B_{35\%}$. Stocks in tiers 1-3 are further categorized (a) (b) or (c) based on the relationship between B and B_{MSY} (or proxy), with (a) indicating a stock where biomass is above B_{MSY} (or proxy), (b) indicating a stock where biomass is below B_{MSY} but above (0.05 x B_{MSY}), and (c) indicating a stock where biomass is below (0.05 x B_{MSY}). The category assigned to a stock determines the method used to calculate ABC and OFL.

The NPFMC inaugurated the Tier system in fisheries management. In this, the harvest control rule depends on the amount of information available and the ratio between total estimated biomass (B) and maximum sustainable yield (B_{MSY}) or, in the case of stocks without a reliable B_{MSY}, a proxy value.

In Tiers 1–3, sufficient information is available to determine a target biomass level, which would be obtained at equilibrium when fishing according to the control rule with recruitment at the average historical level. The control rule is a biomass-based rule, for which fishing mortality is constant when biomass is above the target and declines linearly down to a threshold value when biomass drops below the target.

The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify ACLs with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)).

EBS, AI and Bogoslof Island pollock

The 2013 EBS pollock spawning biomass was projected by the 2012 SAFE to be 2,580,000 t (at the time of spawning, assuming the stock is fished at recommended ABC level). This is above the B_{MSY} value of 2,114,000 t, thus placing the stock into tier 1a. The methodology for calculating F_{OFL} and F_{ABC} for tier 1 stocks is as follows:

Tier 1) Information available: *Reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY}.*

1a) Stock status: $B/B_{MSY} > 1$
$F_{OFL} = \mu_A$, *the arithmetic mean of the pdf*
$F_{ABC} \leq \mu_H$, *the harmonic mean of the pdf*

1b) Stock status: $\alpha < B/B_{MSY} \leq 1$
$F_{OFL} = \mu_A \times (B/B_{MSY} - \alpha)/(1 - \alpha)$
$F_{ABC} \leq \mu_H \times (B/B_{MSY} - \alpha)/(1 - \alpha)$

1c) Stock status: $B/B_{MSY} \leq \alpha$
$F_{OFL} = 0$
$F_{ABC} = 0$

Figure 11. Harvest control rules for Tier 1 stocks, where α = 0.05 by default. From the 2012 BSAI SAFE report introduction.

The 2013 AI pollock spawning biomass was projected by the 2012 SAFE to be 85,240 t, which is below the $B_{40\%}$ (the B_{MSY} proxy in tier 3 stocks) of 99,805 t. This places the stock into tier 3b. The methodology for calculating F_{OFL} and F_{ABC} for tier 3 stocks is as follows:

Tier 3) Information available: *Reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.*

3a) *Stock status:* $B/B_{40\%} > 1$
$F_{OFL} = F_{35\%}$
$F_{ABC} \leq F_{40\%}$

3b) *Stock status:* $\alpha < B/B_{40\%} \leq 1$
$F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$
$F_{ABC} \leq F_{40\%} \times (B/B_{40\%} - \alpha)/(1 - \alpha)$

3c) *Stock status:* $B/B_{40\%} \leq \alpha$
$F_{OFL} = 0$
$F_{ABC} = 0$

Figure 12. Harvest control rules for Tier 3 stocks, where α = 0.05 by default. From the 2012 BSAI SAFE report introduction.

The 2013 Bogoslof Island spawning biomass was projected by the 2012 SAFE to be 67,063 t. The BI stock is categorized as tier 5, in which the methodology for calculating F_{OFL} and F_{ABC} is as follows:

Tier 5) Information available: *Reliable point estimates of B and natural mortality rate M.*
$F_{OFL} = M$
$F_{ABC} \leq 0.75 \times M$

Figure 13. Harvest control rule for Tier 5 stocks. From the 2012 BSAI SAFE report introduction.

GOA pollock stock

The 2013 GOA pollock spawning biomass was projected by the 2012 SAFE to be 259,843 t, which is below the $B_{40\%}$ of 297,000 t. This places the stock into tier 3b – see the AI pollock section above for the tier 3 harvest control rules.

Overfishing and overfished determinations.

None of the EBS, AI, BI or GOA pollock management units are considered overfished or undergoing overfishing. For each stock and stock complex, a determination of status with respect to "overfishing" is made in-season 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, a remedial action will result. This may be an inseason action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to end such overfishing immediately.
- 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. 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 F_{OFL} and F_{MSY} that will rebuild the stock within an appropriate time frame.

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, a remedial action will result. This may be an inseason action, an FMP amendment, a regulatory amendment or a combination of these actions will be implemented to prevent overfishing from occurring.

State waters

Parallel fisheries for pollock take place in state waters around Kodiak Island, in the Chignik Area and along the South Alaska Peninsula. In parallel fisheries quotas are set as a percentage of the broader regional TAC, and so parallel-fishery-specific harvest control rules are not applied. The Prince William Sound state waters stock is managed by ADFG as a tier 5 stock; see the information above in the Bogoslof section for a summary of the calculation used to determine the ABC and OFL for tier 5 stocks.

Evidence

http://icesjms.oxfordjournals.org/content/67/9/1861.full
http://www.afsc.noaa.gov/REFM/Docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOApollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/BOGpollock.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/245938914.pdf
http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/244413419.pdf

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

There are three core components to the application of the precautionary approach in Alaskan groundfish fisheries. Firstly, the FMP for each management area sets out an Optimum Yield (OY) for the groundfish complex as a whole, which includes pollock along with the majority of targeted groundfish species. The second component is the tier system, which assigns each groundfish stock to a tier according to the level of scientific understanding, data available and uncertainty associated with the fishery. Each tier has an associated set of management guidelines, particularly in relation to calculating the level of catch permitted. The more data-deficient a stock, the higher the tier's number, and the more conservatively catch limits are set. At present the GOA and AI pollock fisheries are assigned to tier 3 and the EBS pollock fishery to tier 1. The third component is the Annual Catch Limit (ACL), Overfishing Limit (OFL), Acceptable Biological catch (ABC) and Total Allowable Catch (TAC) system. ACL is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures. OFL is the limit reference point of annual catch after which overfishing is determined to be occurring. For Alaska groundfish stocks, OFL is equal to the expected catch that would occur at the rate (or proxy thereof) which is estimated to provide the maximum sustainable yield (Fmsy). ABC is a recommended level of annual catch that accounts for the scientific uncertainty in the estimate of OFL and any other scientific uncertainty. TAC is the annual catch target for a stock or stock complex, derived from the ABC by considering social and economic factors and management uncertainty (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).

Optimum yield

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 first element of the precautionary approach is the Optimum Yield (OY) for the groundfish complexes in the Bering Sea / Aleutian Islands (BSAI) and the GOA as a range of numbers. The sum of the TACs of all groundfish species (except Pacific halibut) is required to fall within the range. The range for BSAI is 1.4 to 2.0 million mt while 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. That is, that the sum of the TACs exceeded the upper range so harvest was constrained to not exceed the OY cap. The NPFMC originally adopted the 2.0 million mt cap to meet the needs of the ecosystem. Trawl assessment surveys indicated that in many years the sum of the ABCs would have exceeded the OY cap if the NPFMC had not set aside the ABC in excess of the cap for ecosystem consideration. Thus, total groundfish harvest limits the total groundfish harvest that can be taken from the BSAI and GOA marine ecosystems, effectively adopting a conservative ecosystem approach to fisheries.

Tier system

Specification of catch limits begins with the Maximum Fishing Mortality Threshold (MFMT, also known as the OFL control rule). The MFMT is prescribed through a set of six tiers to which each stock can be assigned. Each tier represents a different level of information availability, and has a corresponding harvest control rule. Stocks with limited available information are assigned to a higher and thus subjected to a more conservative OFL calculation. The GOA pollock stock is currently assigned to tier 3b, and the EBS pollock fishery is currently assigned to tier 1a, the BI stock is assigned to tier 5, and the AI stock is assigned to tier 3b.

OFL, ABC, ACL and TAC

The third element of the precautionary approach is the ACL, OFL, ABC and TAC system. Allowable Biological Catch (ABC) is a scientifically acceptable level of harvest based on the biological characteristics of the stock and its current biomass level. Overfishing Level (OFL) is a limiting catch level, corresponding to fishing at MSY level, higher than ABC, which demarcates the boundary beyond which the fishery is no longer viewed as sustainable. In application, the NPFMC sets TAC ≤ ABC < OFL. Since 1981, actual groundfish harvests have averaged approximately 90% of the cumulative TAC and 65% of the cumulative ABC because of the complex array of accountability measures governing these fisheries. See figure below showing the main catch management measures currently in use by federal management in the BSAI.

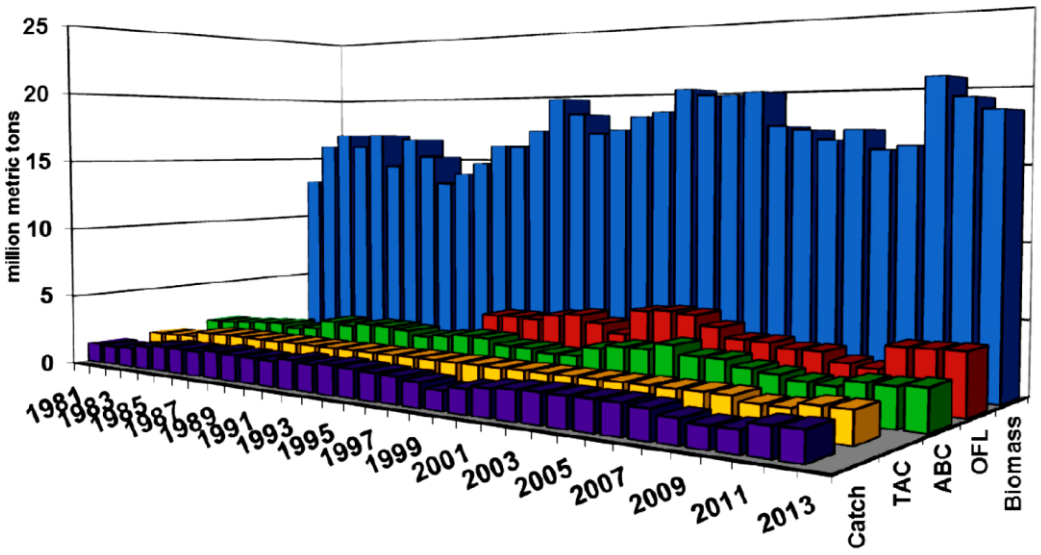


Figure 14. Cumulative estimates of biomass, OFL, ABC, TAC, and annual catch (all in million tons) across all groundfish species in the BSAI, 1981-2013. http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIintro.pdf

The Alaska pollock 2013 total allowable catches have been conservative in all the stock regions (see ABC vs OFL for EBS, AI, BI and GOA Regions under fundamental 6), but especially so in the Eastern Bering Sea Region, which makes up the vast majority (> 90%) of Alaska's landings. In fact the EBS ABC for 2013 has in fact been set at 1,200,000 t, despite a *MaxABC* of over 2.3 million t.

In-season management

NMFS Alaska Region's In-season Management Branch determines the proportion of each TAC anticipated to be caught incidentally in other target fisheries. Bycatch from a given stock is limited by a Maximum Retainable Bycatch amount (MRB), which is determined as a percentage of retained catch (not including arrowtooth flounder). In practice, NMFS attempts to manage a fishery so that total catch (including all discards) is less than, but very close to the TAC. Ideally, the directed fisheries are closed well before TAC is reached, so that when bycatch numbers for that stock in other fisheries are factored in, the annual total catch is less than but close to TAC. When a directed fishery is closed, bycatch of that stock is limited by an MRB amount. If it appears that the TAC may be exceeded due to unanticipated circumstances, and ABC is being approached, NMFS managers will prohibit retention of that species by all fisheries, in order to eliminate any 'top off' activity for bycatch of valuable species. If ABC is exceeded, and OFL is being approached, NMFS can prohibit or close any fisheries that might possibly take that species as bycatch.

The Council determines the TAC based on social and economic considerations. 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 (see figure above). The four main reasons that TAC may be set lower than ABC are: (1) to remain under the 2 million mt OY limit; (2) to increase a rebuilding rate or address other conservation issues; (3) to limit incidental bycatch, for example of halibut; or (4) to account for state water removals. Fisheries are managed in-season to achieve the TACs without exceeding the ABC or OFL.

In-season management is supported by the Alaska Catch Accounting System (CAS), which provides near real-time delivery of accurate observer data, dealer landing reports, and at-sea production reports. Data from industry are reported through the Electronic Reporting System and fed into the NMFS database every hour. Data from observers are sent to the Alaska Fisheries Science Center electronically and are transmitted into the CAS every night. Additionally, VMS provides in-season managers specific effort information in real-time that leads to improved closure precision.

ACLs

The 2006 reauthorization of the MSA included the requirement that the Council's SSC specify ACLs with accompanying accountability measures when setting annual harvest quotas. The guidelines stipulated that ACL may not exceed ABC and that if ACL=ABC=OFL, then the proposal will prevent overfishing with accountability measures. Because Council's groundfish FMPs are multiyear plans, their plans provide that if ACL is exceeded in one year, then accountability measures are triggered for the next year to assure compliance (50 CFR 600.310 (f)(5)).

State waters

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 0.75. Although all pollock in the Gulf of Alaska are considered one stock, pollock in Prince William Sound are not formally assessed by NMFS trawl surveys; though in recent years AFSC has assisted the State of Alaska with the winter acoustical survey. The ADFG surveys of pollock in Prince William Sound are used to set the GHL; which is then

set as a percent of the GOA ABC and is subtracted before TACs are set. Fishing levels in the state-managed parallel fisheries in Kodiak, Chignik and the South Alaska Peninsula are set as a percentage of the federal TACs.

Evidence

http://icesjms.oxfordjournals.org/content/67/9/1861.full
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf

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

Evidence adequacy rating:

☑ High **☐ Medium** **☐ Low**

Rating determination

The Magnuson Stevens Act is the federal legislation that defines how fisheries off the United States EEZ are to be managed. From this legislation and NPFMC objectives, the management system for the Alaska groundfish fisheries has developed into a complex suite of measures comprised of harvest controls—e.g., OY, TAC, ABC, OFL, ACL—effort controls (limited access, licenses, cooperatives), time and/or area closures (habitat protected areas, marine reserves), by-catch controls (PSC limits, Maximum Retainable Allowances (MRA), gear modifications, retention and utilization requirements), observers, monitoring and enforcement programs, social and economic protections, and rules responding to other constraints (e.g., regulations to protect Steller sea lions (SSL)). The NPFMC harvest control system is complex and multi-faceted in order to address issues related to sustainability, legislative mandates, and quality of information.

Derivation and management of catch limits

The methodology used to derive annual quotas for each groundfish stock is considered in detail under clauses 7 and 9. Pollock TAC is apportioned geographically in the GOA, spatially in PWS, and temporally in the EBS and GOA into seasonal allowances (A=roe season and B=non-roe season), and between components of the fleet (i.e. inshore and offshore allocations as incorporated in the AFA allocation). In the GOA pollock fishery, 20% of the TAC is set aside as a reserve, which can be apportioned to any component of the fishery at any time by the regional administrator.

Attainment of the pollock TAC in either region results in the closure of the directed pollock fishery in that region. Pollock may continue to be caught as bycatch in other fisheries as long as such bycatch is not considered to be detrimental to the pollock stock. See clause 7 for more detail.

Steller Sea lions

The management of pollock and some other groundfish stocks in the GOA and BSAI has been significantly influenced by concerns over the possible impact of the fisheries on rebuilding Steller sea lion populations. For the pollock fisheries, comparisons of seasonal fishery catch and pollock biomass distributions (from surveys) by area in the EBS led to the precautionary conclusion that the pollock fishery may have had disproportionately high seasonal harvest rates within Steller sea lion (SSL) critical habitat that could lead to reduced sea lion prey densities. Because SSL are designated as "endangered", the precautionary aspects of ESA require limitations on fisheries to continue.

As a result, 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. At present, 210,350 km^2 (54%) of critical sea lion habitat is closed to the pollock fishery, with further restrictions on the proportion of annual pollock TAC which can be removed from the BSAI Steller sea lion Conservation Area (SCA).

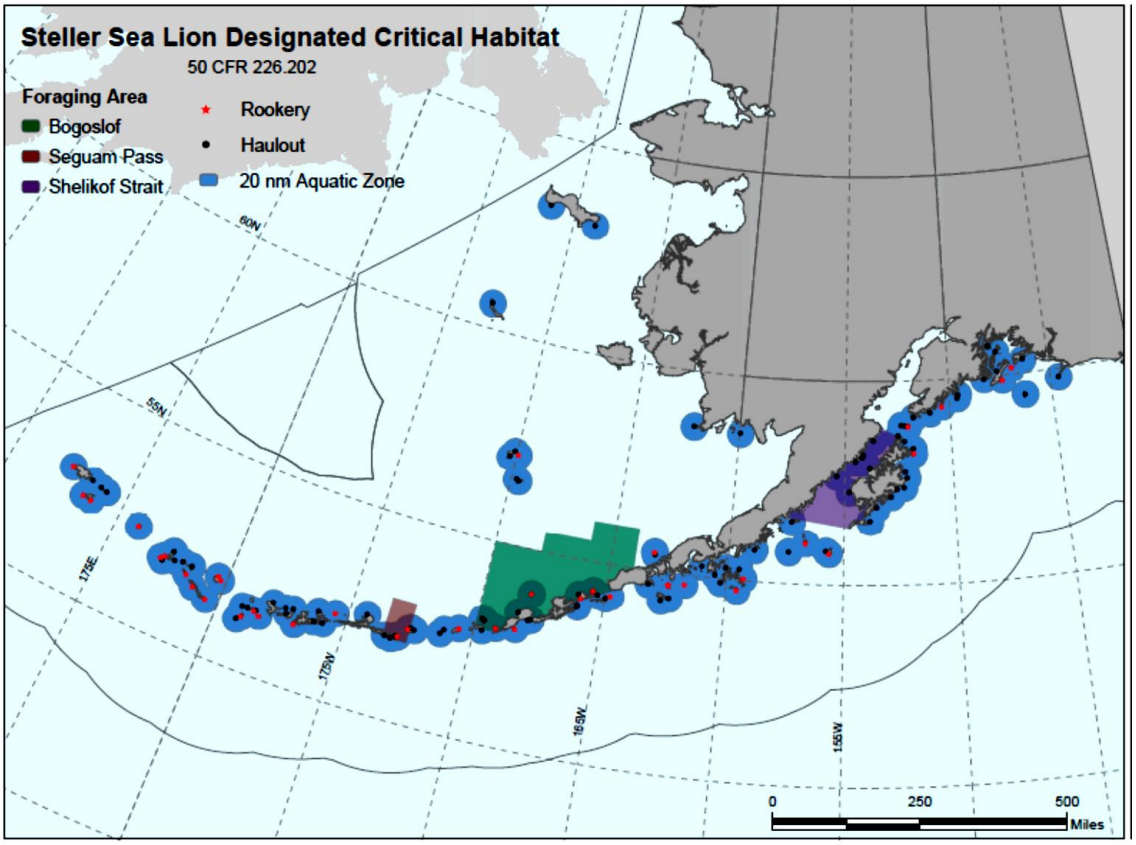


Figure 15. Steller Sea Lion Protection Areas from NOAA Alaska Region.

NMFS, in consultation with the NPFMC prepared a draft Environmental Impact Statement/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EIS/RIR/IRFA) to provide decision makers and the public with an evaluation of the environmental, social and economic effects of alternatives to the Steller sea lion protection measures for the BSAI Management Area groundfish fisheries, in particular the Atka mackerel, Pacific cod and pollock fisheries in the AI.

The western distinct population segment (WDPS) of Steller sea lions is listed as endangered under the Endangered Species Act, and the species population in the Aleutian Islands is declining. Atka mackerel, Pacific cod, and pollock are principal prey species for Steller sea lions in the Aleutian Islands. This proposed action would implement Steller sea lion protection measures for the Aleutian Islands Atka mackerel, Pacific cod, and pollock fisheries to mitigate the potential fishery impacts on the WDPS of Steller sea lions in a manner that minimizes economic impacts to these fisheries. NMFS will consider public comments on the draft EIS/RIR/IRFA from the 60-day review period and will complete the final EIS in early 2014.
http://alaskafisheries.noaa.gov/sustainablefisheries/sslpm/eis/

Salmon Bycatch BSAI

The NPFMC 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 (http://alaskafisheries.noaa.gov/frules/77fr5389.pdf).

Previously Chinook salmon bycatch had been managed in the Bering Sea through triggered time and area closures and most recently by a fleet-managed rolling hot spot (RHS) bycatch avoidance program. The amount of Chinook salmon incidental catch in the Alaska groundfish fisheries in 2012 was below the incidental take statement amounts for both the BSAI and GOA groundfish fisheries.

Table 16 provides updated sector-specific information regarding salmon incidental catch in the BSAI and GOA groundfish fisheries for 2004 through December 31, 2012. Approximately 87% of the incidental catch in the BSAI and GOA occurred in the pollock pelagic trawl fishery. The amount of Chinook salmon incidental catch in the BSAI groundfish fisheries in 2012 of 12,947 fish, is less than the incidental take limit for Chinook salmon in the Bering Sea pollock fishery as managed under Amendment 91 prohibited species catch (PSC) limits and less than the combined incidental take limit of the PSC limit under Amendment 91 and the 8,745 Chinook salmon for the non-pollock fisheries in the BSAI management area. The BSAI fishery incidental take amount statement was revised in accordance with Amendment 91 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI FMP) (NMFS 2009a). As of April, 2013 there is an active motion in the NPFMC requesting an updated report on Chinook salmon bycatch in the BS Pollock fishery including a review of stock status, a report on the genetic stock identification research, data to evaluate the performance of Amendment 91 and a presentation of the incentive mechanisms contained within the IPAs.

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/ChinookBycMotion413.pdf

Table 16. BSAI groundfish fisheries total Chinook salmon catch compared against total groundfish catch: 2004–2012*.

BSAI Chinook Count			2004	2005	2006	2007	2008	2009	2010	2011	2012
Trawl Gear	Pelagic	Pollock Target	48,733	67,362	82,695	121,770	21,481	12,406	9,693	25,499	11,344
	Non-Pelagic	Pacific Cod Target	5,599	3,764	3,620	6,287	2,063	1,054	1,256	446	931
		Flatfish	2,166	2,950	725	1,169	246	166	636	19	175
		Other Targets	404	135	13	279	308	354	883	644	438
Non-Trawl Gear		All Targets	57	56	31	74	10	11	12	62	56
TOTAL			**56,960**	**74,266**	**87,084**	**129,579**	**24,107**	**13,990**	**12,479**	**26,670**	**12,944**

BSAI Groundfish			2004	2005	2006	2007	2008	2009	2010	2011	2012
Trawl Gear	Pelagic	Pollock Target	1,452,486	1,461,803	1,474,864	1,341,395	980,866	810,475	803,513	1,199,034	1,204,378
	Non-Pelagic	Pacific Cod Target	109,816	81,230	85,564	93,077	43,859	38,238	36,938	44,549	53,932
		Flatfish	180,893	192,555	194,683	217,734	293,334	245,561	277,416	310,371	324,734
		Other Targets	75,530	78,422	80,320	85,251	83,688	99,496	100,458	86,259	79,280
Non-Trawl Gear		All Targets	160,425	167,103	146,677	122,831	144,323	143,798	136,863	178,038	196,490
TOTAL			**1,979,151**	**1,981,113**	**1,982,108**	**1,860,289**	**1,546,070**	**1,337,568**	**1,355,187**	**1,818,251**	**1,858,814**

BSAI Chinook Rate			2004	2005	2006	2007	2008	2009	2010	2011	2012
Trawl Gear	Pelagic	Pollock Target	0.034	0.046	0.056	0.091	0.022	0.015	0.012	0.021	0.009
	Non-Pelagic	Pacific Cod Target	0.051	0.046	0.042	0.068	0.047	0.028	0.034	0.010	0.017
		Flatfish	0.012	0.015	0.004	0.005	0.001	0.001	0.002	0.000	0.001
		Other Targets	0.005	0.002	0.000	0.003	0.004	0.004	0.009	0.007	0.006
Non-Trawl Gear		All Targets	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
TOTAL			**0.029**	**0.037**	**0.044**	**0.070**	**0.016**	**0.010**	**0.009**	**0.015**	**0.007**

*2012 data are preliminary
Source: NMFS Alaska Region Catch Accounting System: 3/20/2013

http://alaskafisheries.noaa.gov/sustainablefisheries/bycatch/salmon/chinook/annualrptchinookbycatch0613.pdf

The NPFMC was presented the BS chum salmon PSC Management Measures Initial Review Draft Environmental Assessment and the Bering Sea Non-Chinook Salmon PSC Management Measures INITIAL REVIEW DRAFT Regulatory Impact Review/Initial Regulatory Flexibility Analysis in November, 2012. Currently the fleet is exempt from the chum salmon savings area closure provided it participates in a rolling hot spot (RHS) program which uses real-time data to move the fleet off areas of high bycatch weekly. The alternatives under consideration by the NPFMC include new time and area closures, hard caps and RHS regulations. In March of 2013 a report was provided to the NPFMC on closure zones that were established for the Bering Sea pollock fishery to ensure that fishing vessels would avoid areas with the potential for substantial bycatch of chum salmon (*Oncorhynchus keta*).

Vessel Monitoring System (VMS) units monitored the movement and location of fishing vessels, and fisheries observers and vessel logbooks recorded whether vessels were actively fishing. Sea State, Inc. establishes these closure zones and monitors vessel compliance of these zones using VMS data. Sea State, Inc. also presented a report to the NPFMC in April of 2013 on the results of the BSAI Pollock Intercoop Salmon Avoidance Agreement (ICA). During the course of the B season fishery, the pollock Intercoop closed 32 areas to fishing based on high bycatch rates of chum salmon experienced by vessels working in the area. The report analyzed the estimated number of salmon avoided as demonstrated by the movement of fishing effort away from salmon hot-spots.
There is some discussion (December, 2012) regarding the Council's concern that the current suite of alternatives does not provide a solution to the competing objectives outlined in the problem statement and purpose and need, recognizing the overall objective to minimize salmon bycatch in the Bering Sea pollock fishery to the extent practicable, while providing for the ability to achieve optimum yield in the pollock fishery. It is clear from the analysis thus far that measures considered to reduce bycatch of Alaska origin chum have a high likelihood of undermining the Council's previous actions to protect Chinook salmon.
The Council requests that each sector provide a proposal that would detail how they would incorporate a western Alaska chum salmon avoidance program, with vessel level accountability, within their existing Chinook IPA for Council review. Upon review and public input, the Council would determine whether to further pursue this potential approach to best meet the multiple objectives outlined in the problem statement.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/BSAIchumBycMotion1212.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/ChumPSC_Appendix5-7_1112.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/ChumPSC_EA1112.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/catch_shares/CoopRpts2013/C6d_SeaStateABRauditComplianceMonitor313.pdf

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/catch_shares/CoopRpts2013/C6d_BSpollockSalmonICA313.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/ChumPSC_RIR_1112.pdf

Salmon Bycatch GOA

In 2012, Amendment 93 was implemented in the GOA to limit the amount of Chinook salmon caught in the pollock fishery. Amendment 93 establishes separate prohibited species catch (PSC) limits in the Central and Western GOA for Chinook salmon, which enables NMFS to close the directed pollock fishery in the Central or Western regulatory areas of the GOA, if the applicable limit is reached. This action also requires retention of salmon by all vessels in the Central and Western GOA pollock fisheries until the catch is delivered to a processing facility where an observer is provided the opportunity to count the number of salmon and to collect scientific data or biological samples from the salmon (http://alaskafisheries.noaa.gov/frules/77fr42629.pdf). A study was prompted into new salmon excluders as a way to help pollock vessels remain within the new 25,000-fish, fleet-wide annual harvest limits for Chinook salmon. The new limit for the central and western Gulf of Alaska pollock fisheries has created some concern, as it is shared among the fleet -- so the bycatch of one boat affects everyone. The limit set by the Council is close to the average catch history since 2003, but the more recent years have seen some higher catches (44,061 fish in 2010 for example).
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/GOAchinookBycMotion1212.pdf

Salmon Excluder Device

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 behavior 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 too begun to consider how the Bering Sea Chinook salmon excluder might be adapted for the smaller GOA pollock fleet. An Exempted Fishing Permit was granted by NOAA for testing new salmon excluders and trails began in April, 2013. The design of the salmon excluder was inspired by previous work on salmon bycatch reduction in the Bering Sea pollock fishery. It creates selectivity of the two fish species by exploiting the salmon's superior swimming ability to move up and out of an escape opening, while the slower pollock are retained in the net. This design showed great success in the Bering Sea, where many boats continue to use the excluder. Adaptations of the design for use by the smaller Gulf of Alaska boats include a scaled down net size, altered water flow regime, lower vessel horsepower and tow speeds, and variable fish densities.

Initial sea trials out of Kodiak, Alaska in April 2013, showed salmon escapement rates of over 20% and pollock retention rates as high as 99%, and there is hope for further improvement on these initially promising results. Researchers are continuing to work with captains to test the excluder under conditions truly representative of commercial fishing operations. They are looking for situations with a relatively high number of salmon and enough pollock to fully vet the results. Future sea trials are planned for the fall as well as the spring and fall of 2014. After seeing the success of the Bering Sea excluder, industry members are eager to see the project results. Potential economic

impacts associated with a fishery shutdown would be significant and far reaching. The Alaskan pollock fishery lands almost 3 billion pounds of fish per year -- the largest fishery in the U.S. by weight -- valued at just under $375 million.
http://www.alaskajournal.com/Alaska-Journal-of-Commerce/January-Issue-4-2013/Spring-test-set-for-Gulf-salmon-excluders/
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/EFPsalmon_excluder1112.pdf
http://www.gmri.org/mini/index.asp?ID=58&p=173

Roe-stripping

Historically, the wasteful fishing practice of roe stripping by the offshore fleet produced 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 NPFMC prohibited roe stripping. It further established a NPFMC 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 is separated into four equal quarterly allowances. The percentage of the TAC allocated to each regulatory area is based on survey fish distribution and abundance and set annually during the TAC specifications process.

Regulations at 50 CFR part 679.27 describe the Improved Retention/Improved Utilization (IR/IU) Program for pollock, Pacific cod, and Gulf of Alaska (GOA) shallow water flatfish. Regulations at 50 CFR part 679.5 describe recordkeeping and reporting (R&R) requirements. Any action intended to discard or release an IR/IU species prior to being brought on board the vessel is prohibited. This includes, but is not limited to bleeding codends and shaking or otherwise removing fish from longline gear.

Retention Rates for 2013

Table 17. BSAI and GOA report of Pollock discarded and retained from weekly production and observer reports (includes CDQ). Through September 28, 2013.

	Retained (mt)	Discarded (mt)
GOA	63393	1423
BSAI	1239210	4326

Permits

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 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.

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.

Reporting

Groundfish harvest is documented and submitted via the Interagency Electronic Reporting System, *e*Landings. Upon completion of the off-load, all harvest, purchased, retained or discarded, must be recorded on a fish ticket and submitted within seven days to the nearest ADFG office. Catcher-processors are required to submit daily production reports.

Observers

At the core of the North Pacific monitoring system is a comprehensive, industry-funded, on-board and onshore observer program, coupled with requirements for total weight measurement of most fish harvested. All vessels fishing for groundfish with a federal fishing permit in federal waters or in a State of Alaska parallel fishery, and all vessels fishing halibut and sablefish IFQ in federal or state waters, are included in the observer program and are required to carry one or more observers for at least a portion of their fishing time if selected. Observer requirements are based on vessel length, fishery and vessel type.

Fishery observers perform multiple functions; they collect data on catch and bycatch quantity, composition, and biological characteristics, document fishery interactions with marine mammals and birds, and monitor compliance with federal fisheries regulations.

The new program offers increased observer coverage on all vessels >40’ (vessels <40’ are exempted for the first year) and the introduction of full coverage in fleets previously subject to partial coverage criteria, vessels remaining within the partial coverage grouping will be selected based on a random draw system with a mandatory obligation to carry an observer. The new observer plan began operations in January, 2013, and makes provisions for the use of electronic monitoring technology as an alternative to sea going observers for certain vessel categories.

During the first year of the new Observer Program, carrying an electronic monitoring (EM) system instead of a human observer will not be an option. NMFS is developing EM technologies in conjunction with Saltwater, Inc., to collect catch, discard, and fishing effort data aboard commercial vessels. Operators of vessels in the Vessel Selection pool may volunteer to assist in this study. The number of EM units is limited in the first year; therefore, not all operators who volunteer will be provided EM equipment. Selected vessels will be eligible to carry EM equipment for a set period of time when fishing. http://alaskafisheries.noaa.gov/sustainablefisheries/observers/overview.pdf

http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/Observer/AprilEMOAC2013.pdf

Small catcher 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 shore-side plants where there is 100% observer coverage.

Inseason management

NMFS Alaska Region's Inseason Management Branch determines the amount of an individual TAC necessary as incidental catch in other target fisheries. The target fishery is usually closed before reaching the TAC, allowing for bycatch in other fisheries up to the amount of TAC for a species. A directed fishery closure limits retention of a species to a portion of other species TACs open to directed fishing. That portion is called the maximum retainable amount (MRA). The MRA is expressed as a percentage of an alternate target fishery. If the ABC is taken and the trajectory of catch indicates the OFL may be approached, additional closures are imposed. To prevent overfishing, specific fisheries identified by gear and area that incur the greatest incidental catch are closed. Closures expand to other fisheries if the rate of take is not sufficiently slowed. A fishery may also be closed if a PSC limit is reached. Except for scientific purposes, Chinook salmon bycatch management, or the prohibited species donations program, prohibited species cannot be retained in groundfish fisheries. In the rare occurrence of a TAC being exceeded, the Inseason Management Branch will evaluate the conditions that resulted in the overage and determine appropriate management actions that may be needed to prevent a reoccurrence.

The state of Alaska also manages the PWS state pollock fishery with closures when 60% of the TAC in an area has been reached.

Geographical closures & restrictions

A variety of regional restrictions are in place across the GOA and BSAI groundfish fisheries, either prohibiting fishing entirely or restricting the times and gear types permitted. Areas around Kodiak Island have been established to protect king crab stocks. The Sitka Pinnacles Marine Reserve encompasses an area totaling 2.5 square nautical miles off Cape Edgecumbe, where groundfish vessels are not permitted to fish nor anchor. The Pribilof Islands Habitat Conservation Area is closed to all trawling year-round. The Chum Salmon Savings Area is closed to direct fishing for pollock with trawl gear from August 1 through August 31, unless the vessel directly fishing for pollock is operating under a salmon bycatch reduction inter-cooperative agreement. There are a number of no-trawl areas in both the GOA and BSAI, although many apply only to non-pelagic trawls or bottom-contact trawls. Figure 16 shows the year round closures in Alaskan waters.

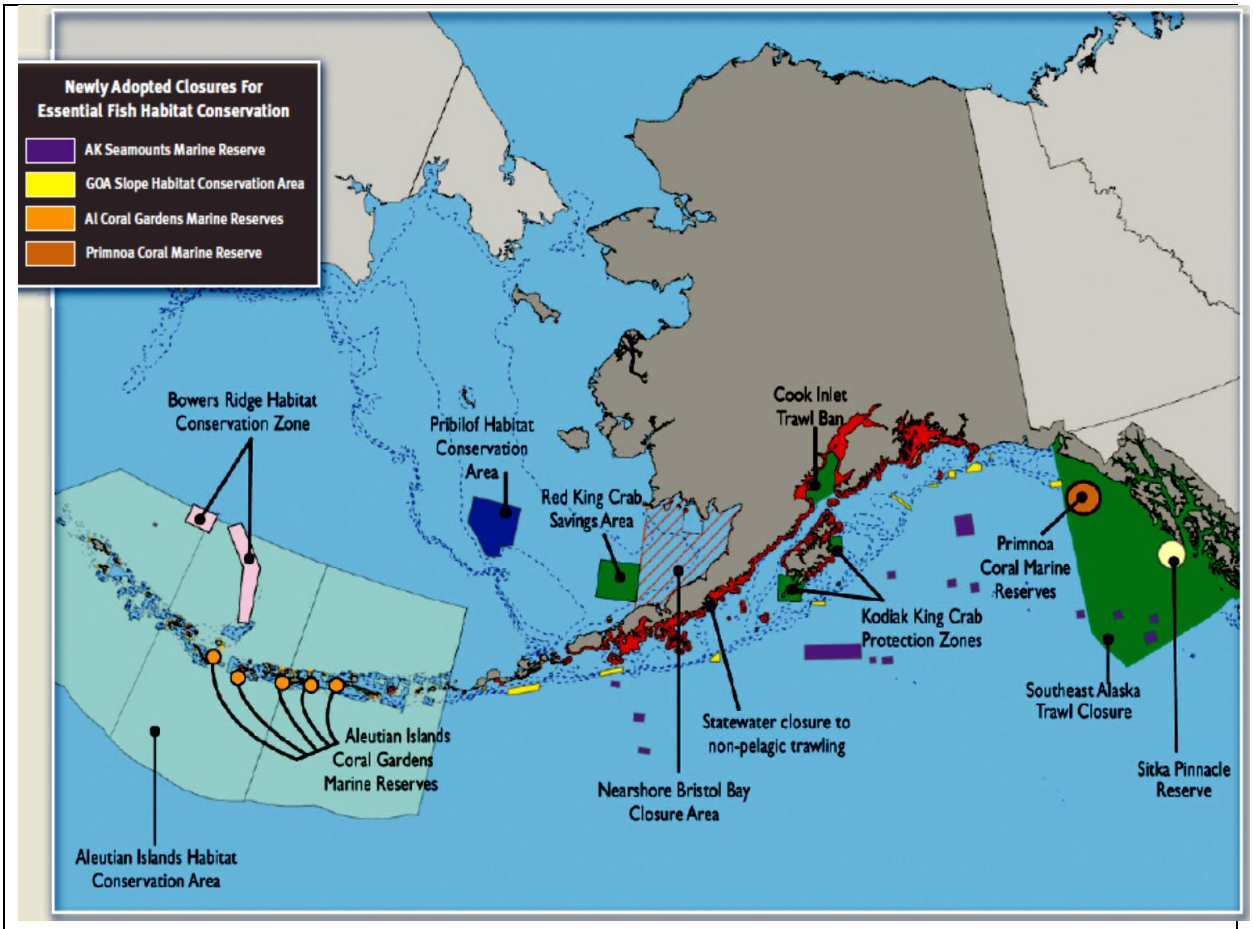


Figure 16. Year round area closures in Alaskan waters.
https://alaskaseafood.org/sustainability/pdf/Marine%20Protected%20Areas%20Brochure.pdf

Gear restrictions

The use of non-pelagic trawl gear in the BSAI and GOA pollock fisheries is prohibited to protect habitat and reduce bycatch of bottom dwelling species.

Evidence

http://www.adfg.alaska.gov/static/license/fishing/pdfs/reporting_requirements.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/BSAIintro.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOAintro.pdf
http://www.afsc.noaa.gov/FMA/default.htm
http://alaskafisheries.noaa.gov/regs/summary.htm#356
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/SalmonBycatch.html
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/BSChinookBycatch.html
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/BSChumBycatch.html
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/EFPsalmon_excluder1112.pdf

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating Determination

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 rigorous process in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. Model projections indicate that the pollock stocks in Alaska is neither overfished nor approaching an overfished condition. The Maximum Sustainable Yield (MSY), defined in the BSAI and GOA groundfish FMPs, is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets. The MSY allows defining the reference points used to manage the groundfish fisheries such that TAC≤ABC<OFL.

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 rigorous process which has been in place for over 30 years ensures that annual quotas are set at conservative, sustainable levels for all managed groundfish stocks. The management system for the NPFMC groundfish fisheries is a complex suite of measures comprised of harvest controls, effort controls (limited access, licenses, cooperatives), time and/or area closures (i.e. gear closures, habitat protection measures, marine reserves), bycatch controls (Maximum Retainable Bycatch (MRB) amounts, PSC limits, 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 and to avoid seabird bycatch).

The Maximum Sustainable Yield (MSY) as defined by the groundfish fishery management plans is "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions, fishery technological characteristics (e.g., gear selectivity), and distribution of catch among fleets." Each groundfish fishery has a defined OY range which is based primarily on historical MSY estimates, and which limits the total annual removals across all stocks. Additionally, an MSY or MSY-proxy is calculated annually for each individual stock within the groundfish complex, depending on the tier (and therefore information available) of the stock.

The EBS pollock stock is categorized as Tier 1a, meaning sufficient information is available to estimate B_{MSY}. The GOA pollock stock is categorized as Tier 3b, meaning that $B_{40\%}$ is used as a proxy for MSY. Each tier defines three harvest control rules, with the status of the stock in relation to the MSY or MSY-proxy determining which is used to generate the recommendations for OFL and ABC.

When the biomass of stocks in tiers 1-3 falls below B_{MSY} or the B_{MSY}-proxy, the harvest control rules result in a proportionally reduced OFL and ABC. If the biomass of a stock falls below 50% of B_{MSY} or the B_{MSY}-proxy, the harvest control rule sets OFL and ABC to 0. The 2012 stock assessments place the 2013 EBS stock biomass above B_{MSY} and the GOA biomass just below the B_{MSY} proxy ($B_{40\%}$). Aleutian Islands and Bogoslof pollock are under tier 3b and 5 respectively. The catches for both stocks have been for several years significantly below OFL, and ABC recommendations (see details provided under Fundamental clause 4, 5 and 6.

The NPFMC has consistently adopted the annual OFL and acceptable biological catch (ABC) recommendations from its scientific and statistical committees (SSC) and set the total allowable catch (TAC) for each of its commercial groundfish stocks at or below the respective ABC. In 1999, the NPFMC prescribed that OFL should never exceed the amount that would be taken if the stock were fished at F_{MSY} (or a proxy for F_{MSY}), 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 can be set lower than catch at F_{MSY} at the discretion of the SSC. OFL can be then virtually defined as an upper limit reference point to constrain harvest rates.

Evidence

http://www.afsc.noaa.gov/REFM/Docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOApollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/BOGpollock.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

Alaska enhances through education and training programs the education and skills of fishers and, where appropriate, their professional qualifications. Records of fishers are maintained along with their qualifications.

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 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 (AYFS). 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.

The 2013 summit was hosted in Anchorage, Alaska, from December 10th to the 12th. The summit provided three days of training in the land-based aspects of running a fishing operation: marketing, business management, the fisheries regulatory process, and the science impacting fisheries management, a visit to the Anchorage office of the Alaska Department of Fish & Game, where participants will talk with fisheries managers and meet researchers using cutting-edge genetic science to better understand Alaska salmon runs and other important stocks.

Finally, the Alaska Marine Safety Education Association (AMSEA) provides courses on small boating safety, drill conductor training, stability and damage control, ergonomics, dredger safety and survival at sea training.

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 and annually renews 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. Additionally, CFEC maintains records for crew members who must certify fishing participation for some of the Council programs.

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.afsc.noaa.gov/REFM/docs/2012/BSAIsablefish.pdf
Alaska Marine Safety Education Association: http://www.amsea.org/

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

The Alaska pollock fishery fleet uses enforcement measures including vessel monitoring systems (VMS) on board vessels, USCG boardings and inspection activities. The U.S. Coast Guard (USCG) and NMFS Office of Law Enforcement (OLE) enforce fisheries laws and regulations. OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). State regulations are enforced by the Alaska Wildlife Troopers (AWT).

Vessel Monitoring Systems (VMS)

VMS in Alaska is a relatively simple system involving a tamperproof VMS unit, set to report a vessel identification and location to the NOAA Fisheries Office of Law Enforcement (OLE) at fixed 30-minute intervals. Although some groundfish-targeting vessels are not, vessels participating in the directed pollock fishery are required to have VMS onboard. In October 2012, the Enforcement Committee noted that having VMS data substantially improves efficiency in both investigating and litigating enforcement violation cases.

In December of 2012 an expanded discussion paper was presented to the Council, and the NPFMC stated that while there is uncertainty regarding whether a major change to (or expansion of) VMS requirements is necessary in the North Pacific, there is interest in reviewing the current state of the North Pacific VMS requirements.
http://www.fakr.noaa.gov/npfmc/PDFdocuments/conservation_issues/VMSdiscusPaper1112.pdf

USCG and OLE

The U.S. Coast Guard (USCG) is the lead federal maritime law enforcement agency for enforcing national and international law on the high-seas, outer continental shelf and inward from the U.S. Exclusive Economic Zone (EEZ) to inland waters. The USCG also patrols US waters to reduce foreign poaching, and inspects fishing vessels for compliance with safety requirements.

Bering Sea/Aleutian Islands Pollock boardings and violations

Pollock in the Bering Sea is targeted solely by trawl gear, and for the most part by pelagic trawl gear. The active size of this fleet is approximately 138 vessels, and the Coast Guard attempts to board approximately 30 vessels each year. The fleet is required to carry VMS and have observer coverage.

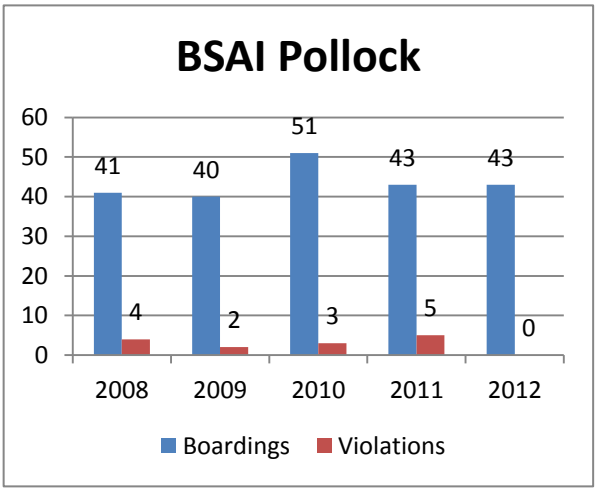
From fiscal year 2008 through the end of fiscal year 2012, the Coast Guard conducted 218 boardings on Bering Sea pollock vessels, noting 13 violations on 14 vessels resulting in a detected violation rate for this fleet of 6.42%. A detail of the boardings and violations detected by fiscal year is provided below. The vast majority of the violations detected were minor in nature.

Annual Averages

- 44 boardings
- 2.8 violations
- 6.42% of vessels had fisheries violations

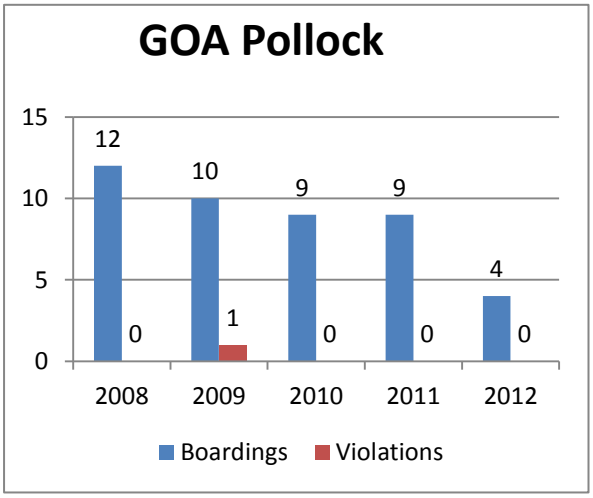
Violations (Over 5 years)

- Logbook errors (11)
- FFP not on board (2)
- Boarding Ladder (1)



Gulf of Alaska Pollock boardings and violations

Pollock in the Gulf of Alaska is targeted solely by trawl gear, although it is a mixture of pelagic and non-pelagic trawl gear. The active size of this fleet is approximately 85 vessels, although the exact number of vessels is hard to pinpoint as the vessels are permitted for and fish in many different fisheries throughout the year. The Coast Guard attempts to board approximately 8 vessels targeting pollock in the Gulf of Alaska each year. The fleet is required to carry VMS and generally has a limited amount of observer coverage. A detail of the boardings and violations detected by fiscal year is provided below. The violation was for failure to facilitate a law enforcement boarding at sea.



Annual Averages

- 9 boarding
- 0.2 violations
- 2.27% of vessels had fisheries violations

Violations (Over 5 years)

- Boarding Ladder (1)

NMFS OLE

NOAA Office of Law Enforcement Special Agents and Enforcement Officers perform a variety of tasks associated with the protection and conservation of Alaska's living marine resources. In order to

enforce these laws, OLE special agents and enforcement officers conduct investigations and use OLE patrol vessels to board vessels fishing at sea, and conduct additional patrols on land, in the air and at sea in conjunction with other local, state and Federal (e.g. USCG) agencies. In any given year, OLE Agents and Officers spend an average 10,000-11,000 hours conducting patrols and investigations, and an additional 10,000-11,000 hours on outreach activities. The OLE maintains 19 patrol boats around the country to conduct a variety of patrols including Protected Resources Enforcement Team (PRET) boardings, protection of National Marine Sanctuaries and various undercover operations.

OLE Special Agents and Enforcement Officers conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, review sales of wildlife products on the internet and conduct patrols on land, in the air and at sea. NOAA Agents and Officers can assess civil penalties directly to the violator in the form of Summary Settlements (SS) or can refer the case to NOAA's Office of General Counsel for Enforcement and Litigation (GCEL). 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.

Alaska Division: NMFS OLE 2013 Enforcement Priorities, Magnuson-Stevens Act

Magnuson-Stevens Act

High Priority
- Observer assault, harassment, or interference violations
- Felony and major civil cases involving significant damage to the resource or the integrity of management schemes
- Commercialization of sport-caught or subsistence halibut
- Maritime Boundary Line incursions by foreign fishing or transport vessels
- Outreach and education

Medium Priority
- Misdemeanor and civil cases involving observer coverage violations
- Closed Area/VMS Violations, ongoing
  - Commercial vessel incursions into closure areas or other Marine Protected Areas
- Recordkeeping and reporting violations that impact data consistency or integrity
- Violations involving lesser damage to the resource or the integrity of management schemes

Low Priority
- Catch reporting and trip limits
  - Noncompliance with trip and cumulative limits and record keeping requirements for landings of federally managed marine species, and specifically catch share programs.
- Gear violations
  - Deployment of unlawful gear utilized in commercial fisheries under NOAA's jurisdiction.
- Lesser permit violations

Endangered Species Act and Marine Mammal Protection Act

High Priority
- Violations wherein responsible subject and species are identifiable
- Lethal takes, Level A harassment with the potential to injure marine mammal stock
  - Species of interest are Cook Inlet beluga, other whale species, northern fur seal, or Steller sea lion
- Any violation involving injury or potential injury to people, such as a vessel-whale collision
- Outreach and Education

Medium Priority
- Non-lethal takes, Level B harassment with the potential to disturb a marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering
- Species is threatened rather than endangered

Low Priority
- Violations wherein responsible subject is not identifiable
- Injured or dead animal cannot be located
- Objective evidence is not obtainable
- Takes of individual marine mammal species that appear consistent with legal harvest by Alaska Natives

International/Lacey Act

High Priority
- Felony and major civil violations (e.g., interstate or foreign trafficking of commercial quantities of illegally harvested fish or marine resources)
- Harvest or transshipment of marine resources by foreign fishing vessels
- Domestic or international violations involving seafood safety; substantive mislabeling of product in domestic or international commerce
- IUU listed vessels

Medium Priority
- Misdemeanor and civil violations (e.g., interstate or foreign trafficking of small quantities of illegally harvested fish or marine resources)
- Mislabeling violations
- IUU identified product

Low Priority
- Minor mislabeling violations
- Violations wherein responsible subject/vessel not identifiable

http://www.nmfs.noaa.gov/ole/docs/2013/ole-division-priorities-2013-final.pdf

Alaska Wildlife Troopers

The Alaska Department of Public Safety, Division of Alaska Wildlife Troopers is responsible for protecting fishery resources within 3 miles of shore, including the PWS state-managed pollock fishery. The patrol and enforcement of these waters is entrusted to the Marine Enforcement Section (MES) of the Alaska Wildlife Troopers, which utilizes 17 vessels that range in size from 25 to 156 feet. Additionally, ADFG staff is deputized as peace officers and have statutory authority (16.05.150) to enforce fishing regulations.

At each of the five annual NPFMC meetings, representatives of the USCG, OLE, NMFS, ADFG and AWT meet in an Enforcement Meeting where enforcement concerns with plan amendments are discussed and materials relating to those concerns are prepared for the Council. During staff reports to the NPFMC the USCG and the OLE present information about vessel boardings and enforcement violations by the fishing industry that occurred since the last NPFMC meeting.

2013 Notable Violations

On May 8, 2013, American Seafoods Company and the owners and operators of the catcher/processors *Ocean Rover* and *Northern Eagle* were charged by NOAA's Office of General Counsel for tampering with the equipment used for weighing Alaska pollock. The respondents in these cases are alleged to have adjusted their flow scales to record lower weights, and then recorded these inaccurate weights in their logbooks in violation of the Magnuson-Stevens Fishery Conservation and Management Act and the American Fisheries Act.

Flow scales are used to ensure accurate catch accounting. Adjusting the equipment to record a lower weight allowed the vessels to go over their quotas. In the *Ocean Rover* case, NOAA's Office of General Counsel issued a NOVA proposing an assessed penalty of $848,000; in the *Northern Eagle*

case, General Counsel issued a NOVA proposing an assessed penalty of $1,337,000.
A NOVA is issued to persons and entities believed to be responsible for an alleged violation, which could include owners and operators of vessels. The respondents have 30 days from the receipt of the NOVA to respond by paying the penalty, seeking to have the assessment modified, or requesting a hearing before an administrative law judge to deny or contest all or any part of the charges and the penalties assessed.
http://www.nmfs.noaa.gov/ole/slider_stories/2013/13_051313americanseafoodsnovas.html
http://www.undercurrentnews.com/2013/06/05/noaa-could-tighten-at-sea-scale-rules-following-american-seafoods-violations/

NOAA issued a briefing to the NPFMC for the June 2013 Council meeting outlining a proposal to revise the regulations concerning the use and approval of scales for weighing catch at-sea.
The use of at-sea scales can provide very precise and potentially accurate estimates of catch. These estimates are especially useful in catch share fisheries where catch accounting methods must be verifiable. At-sea scales have proven to be reliable and are now used to account for the vast majority of catch by catcher-processors fishing off Alaska. However, recent concerns about fraud and tampering with the flow scale call into question the overall accuracy of the approach and indicates that catch estimates based on scale weights could systematically underestimate harvest in those fisheries dependent on scale weights for catch accounting unless these concerns are addressed. Further, since NMFS first implemented weighing requirements for some catcher processors in 1998, the program has grown dramatically; scale technologies have evolved; and NMFS has developed greater expertise with at-sea scales. NOAA affirmed that a suite of modifications to the at-sea scales program would likely reduce the potential for fraud, improve catch accounting accuracy, and bring regulations up to date with recent changes in technology.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/MISC/FlowScale513.pdf

Evidence

NMFS OLE: http://www.nmfs.noaa.gov/ole/index.html
USCG, Alaska region: www.uscg.mil/d17/
http://www.gc.noaa.gov/enforce-office3.html
http://deckboss-thebrig.blogspot.com/search?updated-min=2013-01-01T00:00:00-09:00&updated-max=2014-01-01T00:00:00-09:00&max-results=50
http://dps.alaska.gov/AWT/marine.aspx

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

The Magnuson-Stevens Act (50CFR600.740 Enforcement policy) provides four basic enforcement remedies for violations: ***1)*** *Issuance of a citation (a type of warning), usually at the scene of the offense,* ***2)*** *Assessment by the Administrator of a civil money penalty,* ***3)*** *for certain violations, judicial forfeiture action against the vessel and its catch,* ***4)*** *Criminal prosecution of the owner or operator for some offenses. In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. The 2011 Policy for the Assessment of Civil Administrative Penalties and Permit Sanctions issued by NOAA Office of the General Counsel – Enforcement and Litigation, provides guidance for the assessment of civil administrative penalties and permit sanctions under the statutes and regulations enforced by NOAA. The Alaska Wildlife troopers enforce state water regulations with a number of statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation*.

The Magnuson-Stevens Act provides four basic enforcement remedies for violations (50CFR600.740 Enforcement policy).

(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.

In some cases, the Magnuson-Stevens Act requires permit sanctions following the assessment of a civil penalty or the imposition of a criminal fine. In sum, the Magnuson-Stevens Act 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.

Magnuson Stevens Act Penalty Matrix.

Magnuson-Stevens Penalty Matrix

	Level of Intent			
Harm to the Resource or Regulatory Program, Offense Level	A Unintentional	B Negligent	C Reckless	D Willful
I	Written warning-$1,000	Written warning-$1,500	Written warning-$2,000	Written warning-$2,500
II	Written warning-$2,000	$2,000-$5,000	$5,000-$10,000	$10,000-$15,000

III	$2,000-$5,000	$5,000-$10,000	$10,000-$15,000	$15,000-$25,000
IV	$5,000-$15,000	$15,000-$25,000	$25,000-$50,000 and permit sanction of 10-20 days*	$50,000-$80,000 and permit sanction of 20-60 days*
V	$15,000-$25,000	$25,000-$50,000 and permit sanction of 10-20 days*	$50,000- $80,000 and permit sanction of 20-60 days*	$60,000- $100,000 and permit sanction of 60-180 days*
VI	$25,000-$50,000	$50,000-$80,000 and permit sanction of 20-60 days*	$60,000-$100,000 and permit sanction of 60-180 days*	$100,000-statutory maximum and permit sanction of 1 year-permit revocation*

http://www.nmfs.noaa.gov/sfa/reg_svcs/Councils/ccc_2011/Tab%20L%20-%20Enforcement%20Issues/Enforcement%20Issues.pdf

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, 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

The Alaska Wildlife troopers enforce state water regulations. Here below are presented some of the statutes that enable the government to fine, imprison, and confiscate equipment for violations and restrict an individual's right to fish if convicted of a violation.

AS 16.05.165. Form and issuance of citations
AS 16.05.170 Power to execute warrant
AS 16.05.180 Power to search without warrant
AS 16.05.190 Seizure and disposition of equipment
AS 16.05.195 Forfeiture of equipment
AS 16.05.332 Wildlife Violator Compact
AS.16.05.410 Revocation of license
AS 16.05.710 Suspension of Commercial License and Entry Permit

AS 16.05.722 Strict liability commercial fishing penalties
AS 16.05.723 Misdemeanor commercial fishing penalties
AS 16.05.896 Penalty for causing material damage
AS 16.05.901 Penalty for violations of AS 16.05.871 – AS 16.05.896.
AS 16.05.030 Penalty for violation of 16.10.010-16.10.050
AS 16.10.090 Penalty for violation of AS 16.10.090
AS 16.10.220 Penalty for violation of AS 16.10-200-16.1-.210
AS 16.10.790 Fines
AS 16.40.290 Penalty
AS 16.43.960 Commission revocation or suspension of permits
AS 16.43.970 Penalties

Evidence
Alaska Statutes Title 16 (laws)

Alaska Administrative Code Title 5 (regulations)

Finally, the cooperation of citizens and industry is cultivated through programs such as AWT's Fish & Wildlife Safeguard program, which encourages the reporting of violations, and "leverages" the range of enforcers.

At each of the five annual Council meetings, representatives of the USCG, OLE, NMFS, ADF&G and AWT meet in an Enforcement Meeting where enforcement concerns with plan amendments are discussed and materials relating to those concerns are prepared for the Council. During staff reports to the Council the USCG and the OLE present information about vessel boardings and enforcement violations by the fishing industry that occurred since the last Council meeting.

50CFR600.740 Enforcement policy
http://www.nmfs.noaa.gov/ole/index.html
http://www.noaanews.noaa.gov/stories2011/pdfs/Penalty%20Policy%20--%20FINAL.pdf
http://dps.alaska.gov/awt/

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

Evidence adequacy rating:

☑ **High** ☐ **Medium** ☐ **Low**

Rating determination

The NPFMC, NOAA/NMFS, and other institutions interested in the North Pacific conduct assessments and research on environmental factors affecting pollock and associated species and their habitats. Findings and conclusions are published in SAFE documents, 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. Ecosystem modelling is used to provide an indication of the role of pollock within the food web, and broader ecosystem variables such as climate are reported upon annually in a region-encompassing ecosystem considerations analysis. Two significant ecosystem concerns in relation to the pollock fishery are its possible indirect effects on Steller sea lions, and the quantity of salmon bycatch. Both of these issues are addressed directly in the SAFE assessments, and management measures by State and Federal management agencies are in place to attempt and minimize their severity. Biomass of other pollock predators appears to be stable or increasing in recent years. Habitat interactions of this fishery are not considered significant.*

Ecosystem research

Tens of millions of dollars on research essential to NPFMC management has occurred over the past decade to understand the Bering Sea and Gulf of Alaska ecosystems and how these systems play a dynamic role in pollock stock status. Major research projects like the Bering Sea Integrated Ecosystem Research Program (BSIERP) and the GOA Integrated Ecosystem Research Program (GOAIERP) have provided and are providing, among many others, significant insight into these major North Pacific Integrated Ecosystem Research Plans and research findings that are presented annually at the North Pacific Science Symposium.

GOAIERP

The GOA Integrated Ecosystem Research Program is a $17.6 million Gulf of Alaska ecosystem study that examines the physical and biological mechanisms that determine the survival of juvenile groundfishes in the eastern and western GOA. From 2010 to 2014, oceanographers, fisheries biologists and modelers will look at the gauntlet faced by commercially important groundfishes, specifically walleye pollock, Pacific cod, Pacific ocean perch, sablefish and arrowtooth flounder, during their first year of life as they are transported from offshore areas where they are spawned to

nearshore nursery areas. The study includes two field years (2011 and 2013) followed by one synthesis year (http://gulfofalaska.nprb.org/GOAStudy.html).

BEST - BSIERP

The scientific foundations of the BEST- BSIERP partnership were formed by a blending of two large programs: the "Bering Ecosystem Study" funded by the National Science Foundation; and the "Bering Sea Integrated Ecosystem Research Program", funded by the North Pacific Research Board. The NSF-BEST program focuses on understanding the impacts of changing sea-ice conditions on the chemical, physical, and biological characteristics of the ecosystem and human resource use activities. BSIERP focuses on understanding key processes regulating the production, distribution and abundance of marine organisms in the Bering Sea, especially marine mammals, seabirds, and fish, and how they may respond to natural and human-induced influences, particularly those related to climate change and its economic and sociological impacts (http://bsierp.nprb.org/results/progress.html).

SAFE report, Ecosystem section

NPFMC and NOAA/NMFS conduct assessments and research on environmental factors as affected by the commercial pollock fisheries and associated species and their habitats. Findings and conclusions are published in the Ecosystem section of the SAFE documents, annual Ecosystem Considerations documents, and the various other research reports. The SAFE reports 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. The Resource Ecology and Ecosystem Management (REEM) group at the Alaska Fishery Science Center (AFSC) provides up-to-date ecosystem information and assessments in annual Ecosystem Considerations documents, found under the groundfish stock assessment reports page (http://www.afsc.noaa.gov/REFM/docs/2012/ecosystem.pdf).

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.

http://access.afsc.noaa.gov/reem/ecoweb/

http://fate.nmfs.noaa.gov/

Gulf of Alaska Ecosystem considerations

Prey of pollock

Pollock trophic interactions occur primarily in the pelagic pathway in the food web, which leads from phytoplankton through various categories of zooplankton to planktivorous fish species such as capelin and sandlance, and the primary prey of pollock are euphausiids. Pollock also consume shrimp, which are more associated with the benthic pathway, and make up approximately 18% of age 2+ pollock diet. All ages of GOA pollock are primarily zooplanktivorous during the summer growing season. While there is an ontogenetic shift in diet from copepods to larger zooplankton (primarily euphausiids) and fish, cannibalism is not as prevalent in the Gulf of Alaska as in the Eastern Bering Sea, and fish consumption is low even for large pollock.

In 2012, NPRB funded a project developing a euphausiid biomass time series for the central Gulf of Alaska continental shelf to understand fish-zooplankton interactions and ecosystem conditions. Information about year-to-year changes in the abundance and distribution of euphausiids would be useful for assessments of both commercial fish stocks and ecosystem conditions, but these data are scant. In the eastern Bering Sea, a time series of euphausiid biomass was recently developed using data from acoustic-trawl surveys of walleye pollock that are regularly conducted by NOAA Fisheries, Alaska Fisheries Science Center. These data have allowed new insights into feeding conditions for walleye pollock, into how predation along with climate may influence the abundance of euphausiids, and into variability in the amount of large crustacean zooplankton prey available for the fish, birds, and mammals at higher trophic levels. This project will research and develop this approach using data collected during biennial acoustic-trawl surveys in the central Gulf of Alaska, create a new euphausiid time series for use in stock and ecosystem assessments, and compare the temporal and spatial variability in abundance of zooplanktivorous fishes and euphausiids in two contrasting high-latitude ecosystems, the Gulf of Alaska and the eastern Bering Sea. The project began in January of 2113 and is funded through 2016.
http://project.nprb.org/view.jsp?id=9a0b9aed-bcc9-4d82-88f2-c09da2c74c47

Predators of pollock

Aside from long-recognized decline in Steller sea lion abundance, the major predators of pollock in the Gulf of Alaska are stable to increasing, in some cases notably so since the 1980s (Figure 17). However, top-down control seems to have increased on age 3+ pollock in recent years, perhaps as predators have attempted to maintain constant pollock consumption during a period of declining abundance. It is possible that natural mortality on adult pollock will remain high in the ecosystem in spite of decreasing pollock abundance.

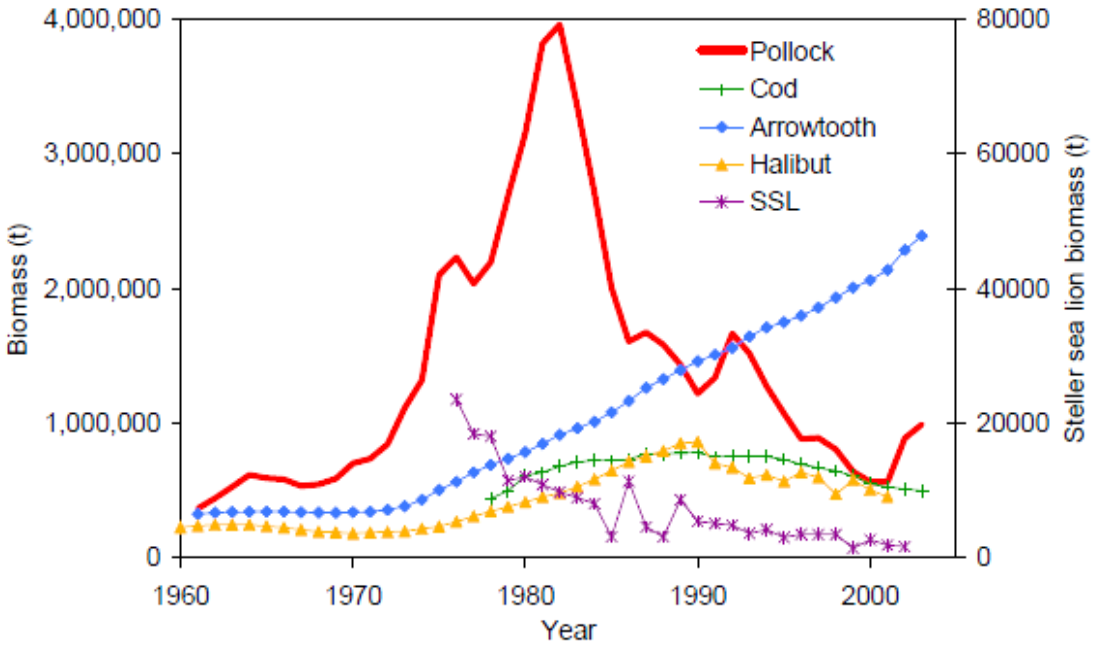


Figure 17. Historical trends in GOA walleye pollock, Pacific cod, Pacific halibut, arrowtooth flounder, and Steller Sea Lions, from stock assessment data. From the 2012 GOA pollock SAFE report.

Ecosystem modelling

ECOSIM and ECOPATH were used to examine the relative role of pollock natural versus fishing mortality within the GOA ecosystem. The model results indicate that the largest effects of declining adult pollock survival would be declines in halibut and Steller sea lion biomass. Declines in juvenile survival would have a range of effects, including halibut and Steller sea lions, but also releasing a range of competitors for zooplankton including rockfish and shrimp. The pollock fishery itself has a lesser effect throughout the ecosystem (fishing mortality is small in proportion to predation mortality for pollock); the strongest modeled effects are not on competitors for prey but on incidentally caught species, with the strongest effects being on sharks. Of the species affecting pollock, arrowtooth flounder (a top down process) has the greatest impact on adult pollock, while bottom up processes (phytoplankton and zooplankton) have the greatest impact on juvenile pollock.

Chinook salmon bycatch

• In 2012, a bycatch cap of 25,000 Chinook salmon was established for the western and central GOA pollock trawl fisheries.
• In 2013, the Council approved a hard cap (7,500 salmon) on Chinook bycatch in all remaining GOA trawl fisheries.
• Full retention of Chinook salmon is also required in all trawl fisheries. Retention of salmon supports research to identify the stock of origin of Chinook salmon bycatch in the GOA.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/Bycatchflyer913.pdf

In 2011, the NPFMC 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 is closed. The maximum Chinook bycatch is 18,316 individuals in the Central area, and 6,684 individuals in the Western area – these limits were first applied in the 2012 fishery. The 2012 GOA pollock fishery caught a total of 18,847 Chinook salmon (http://alaskafisheries.noaa.gov/sustainablefisheries/inseason/goasalmonmort.pdf). The NPFMC approved in December 2012 fishing permits to trial in 2013 and 2014 a Chinook excluder device for the GOA pollock fisheries. Please see **Clause 8** for an update on salmon excluders.

GOA Bycatch data

Incidental catch in the Gulf of Alaska directed pollock fishery is low. For tows classified as pollock targets in the Gulf of Alaska between 2007 and 2011, on average about 94% of the catch by weight of FMP species consisted of pollock. The most common managed species in the incidental catch are arrowtooth flounder, Pacific cod, flathead sole, squid, shallow-water flatfish, and various shark species (e.g., Pacific sleeper sharks, spiny dogfish, salmon shark). The most common non-target species are eulachon and other osmerids, grenadiers, and jellyfish (Table 18).

Table 18. Incidental catch (t) of FMP-managed species in the GOA directed pollock fishery, 2007-2011. Incidental catch includes retained & discarded bycatch estimates (2012 GOA SAFE Report).

Managed species/species group	*2007*	*2008*	*2009*	*2010*	*2011*
Pollock	50646.3	47383.1	39334.5	73033.1	77292.4
Arrowtooth Flounder	1630.1	1569.6	761.0	2071.8	1993.7
Pacific Cod	275.1	579.2	557.0	1497.9	1500.5
Flathead Sole	327.7	423.5	215.7	360.2	217.4
Squid	410.0	91.8	320.9	129.0	208.8
Shallow Water Flatfish	157.0	230.0	17.0	78.5	291.0
Sharks	248.0	113.5	55.9	279.2	27.0
Pacific Ocean Perch	29.8	49.9	36.1	96.6	172.3
Rex Sole	43.0	58.1	35.5	60.7	90.0
Big Skate	38.1	21.7	33.8	47.1	92.6
Atka Mackerel	200.2	0.1	0.0	0.4	0.1
Shortraker Rockfish	55.9	70.3	26.2	9.4	24.4
Rougheye Rockfish	30.2	42.9	12.9	30.5	34.5
Longnose Skate	26.7	23.6	35.1	9.8	35.0
Sculpins	21.8	15.3	5.0	6.1	49.8
Northern Rockfish	12.0	7.9	11.7	2.2	13.7
Sablefish	3.2	1.3	0.1	1.3	31.7
Pelagic Shelf Rockfish	6.4	4.1	1.5	5.8	19.1
Deep Water Flatfish	5.5	5.8	2.4	3.1	14.6
Other Skate	9.1	5.9	2.6	7.0	1.9
Other Rockfish	2.0	4.5	0.2	0.4	6.8
Octopus	1.5	0.0	0.1	0.8	2.3
Thornyhead Rockfish	0.3	0.2	0.1	0.1	1.8
Percent non-pollock	*6.5%*	*6.5%*	*5.1%*	*6.0%*	*5.9%*

Table 19. Incidental catch (t) of non-FMP-managed species in the GOA directed pollock fishery, 2007-2011. Incidental catch includes retained & discarded bycatch estimates. (2012 GOA SAFE Report).

Non target species/species group	*2007*	*2008*	*2009*	*2010*	*2011*
Eulachon	220.98	760.17	217.62	227.44	308.83
Other osmerids	49.42	401.86	149.79	6.78	78.59
Giant Grenadier	4.71	217.09	26.35	1.93	108.30
Jellyfish	24.06	191.51	11.30	121.72	7.72
Miscellaneous fish	24.18	35.36	42.90	42.25	43.54
Grenadier	0.00	26.81	0.00	9.23	7.97
Sea star	4.73	6.58	0.00	4.74	3.65
Capelin	0.00	0.00	0.01	0.00	7.94
Pandalid shrimp	1.89	0.83	0.17	1.12	0.12
Sea anemone unidentified	0.68	0.26	0.00	0.47	0.55
Misc crabs	0.93	0.07	0.00	0.01	0.11
Snails	0.00	0.33	0.01	0.00	0.06
Stichaeidae	0.29	0.00	0.00	0.07	0.00
Bivalves	0.09	0.05	0.00	0.05	0.04
Eelpouts	0.00	0.00	0.13	0.09	0.00
Invertebrate unidentified	0.20	0.00	0.00	0.00	0.00
Surf smelt	0.00	0.16	0.00	0.00	0.00
Hermit crab unidentified	0.00	0.01	0.00	0.09	0.00
Benthic urochordata	0.00	0.00	0.00	0.00	0.09
urchins dollars cucumbers	0.00	0.04	0.00	0.00	0.00
Misc inverts (worms etc)	0.03	0.00	0.00	0.00	0.00

Table 20. Bycatch of prohibited species for trawls in the Gulf of Alaska during 2007-2011 where pollock was the predominant species in the catch. Herring and halibut bycatch is reported in metric tons, while crab and salmon are reported in number of fish. From the 2012 GOA pollock SAFE report.

Species/species group	*2007*	*2008*	*2009*	*2010*	*2011*
Bairdi Tanner Crab (nos.)	19,458	1,740	6,633	108	10,033
Blue King Crab (nos.)	0	0	0	0	0
Chinook Salmon (nos.)	35,170	10,696	3,195	44,779	13,836
Golden (Brown) King Crab (nos.)	0	0	0	0	0
Halibut (t)	135.4	119.0	63.5	49.2	193.1
Herring (t)	19.6	0.9	8.1	0.9	10.7
Non-Chinook Salmon (nos.)	953	847	333	748	1247
Opilio Tanner (Snow) Crab (nos.)	15	0	0	0	0
Red King Crab (nos.)	0	0	0	0	0

Eastern Bering Sea pollock Ecosystem considerations

In general, a number of key issues for ecosystem conservation and management can be highlighted. These include: preventing overfishing; avoiding habitat degradation; minimizing incidental bycatch (via multi-species analyses of technical interactions); controlling the level of discards; and considering multi-species trophic interactions relative to harvest policies. For the case of pollock in the Eastern Bering Sea, the NPFMC and NMFS continue to manage the fishery on the basis of these issues in addition to the single-species harvest approach. The prevention of overfishing is clearly set out as the main guideline for management. Habitat degradation has been minimized in the pollock fishery by converting the industry to pelagic-gear only. Bycatch in the pollock fleet is closely monitored by the NMFS observer program and managed on that basis. Discard rates of many species have been reduced in this fishery and efforts to minimize bycatch continue.

Table 21. Analysis of ecosystem considerations for BSAI pollock and the pollock fishery.

Indicator	Observation	Interpretation	Evaluation
	Ecosystem effects on EBS pollock		
	Prey availability or abundance trends		
Zooplankton	Stomach contents, ichthyoplankton surveys, changes mean wt-at-age	Data improving, indication of recent increases since 2004 (for euphasiids)	Nearly three-fold change in apparent abundance—indicates favorable conditions for recruitment (for prey)
	Predator population trends		
Marine mammals	Fur seals declining, Steller sea lions increasing slightly	Possibly lower mortality on pollock	Probably no concern
Birds	Stable, some increasing some decreasing	Affects young-of-year mortality	Probably no concern
Fish (Pollock, Pacific cod, halibut)	Stable to increasing	Possible increases to pollock mortality	
Changes in habitat quality			
Temperature regime	Cold years pollock distribution towards NW on average	Likely to affect surveyed stock availability	Some concern, the distribution of pollock to different surveys may change systematically
Winter-spring environmental conditions	Affects pre-recruit survival	Probably a number of factors	Causes natural variability
Production	Fairly stable nutrient flow from upwelled BS Basin	Inter-annual variability low	No concern

	Fishery effects on ecosystem		
	Fishery contribution to bycatch		
Prohibited species	Stable, heavily monitored	Likely to be safe	No concern
Forage (including herring, Atka mackerel, cod, and pollock)	Stable, heavily monitored	Likely to be safe	No concern
HAPC biota	Likely minor impact	Likely to be safe	No concern
Marine mammals and birds	Very minor direct-take	Safe	No concern
Sensitive non-target species	Likely minor impact	Data limited, likely to be safe	No concern
Fishery concentration in space and time	Generally more diffuse	Mixed potential impact (fur seals vs Steller sea lions)	Possible concern
Fishery effects on amount of large size target fish	Depends on highly variable year-class strength	Natural fluctuation	Probably no concern
Fishery contribution to discards and offal production	Decreasing	Improving, but data limited	Possible concern
Fishery effects on age-at-maturity and fecundity	Maturity study (gonad collection) underway	NA	Possible concern

Ecosystem effects on the EBS pollock stock

Multi-frequency acoustic classification, backscatter modeling, and net capture were recently used to develop, apply, and validate a method of surveying euphausiid distribution and abundance during regular acoustic-trawl surveys of walleye pollock, an important commercial fish stock. These observations of euphausiids have both ecological and management implications. Summer surveys indicate that pollock predation may control euphausiid abundance: the stocks are inversely correlated in space and time, and estimated predation by pollock is sufficient to influence the euphausiid standing stock. Spring observations show that euphausiids and pollock are spatially segregated by ice cover and water temperature, which might mediate predation by pollock. This information on euphausiid abundance and distribution is being used as an index of prey availability in pollock stock assessment, and as a way of monitoring the status of euphausiids in assessment of the Bering Sea ecosystem. In the 2009 SAFE report, an analysis of MACE AT survey backscatter as an index of euphausiid abundance on the Bering Sea shelf was presented. In 2010 the index was updated and spatial distributions and trends were evaluated using methods described in De Robertis et al., (2010) and Ressler et al. (2012). Euphausiid data continues to be collected during AFSC acoustic surveys. The 2012 preliminary spatial distribution of the euphausiid abundance index is presented in the survey report, but analyses are still in progress.

http://asadl.org/jasa/resource/1/jasman/v129/i4/p2698_s3?bypassSSO=1
http://www.afsc.noaa.gov/Publications/ProcRpt/PR2013-02.pdf

EBS pollock fishery effects on the ecosystem

Since the pollock fishery is primarily pelagic in nature, the bycatch of non-target species is small relative to the magnitude of the fishery. Jellyfish represent the largest component of the bycatch of non-target species. 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.

Table 22. Bycatch estimates (t) of non-target species caught in the BSAI directed pollock fishery, 2003-2012 based on observer data as processed through the catch accounting system (NMFS Regional Office, Juneau, Alaska). Note that in 2011 species groups left blank are because they have moved into "target" FMP categories.

Category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Scypho jellies	5,644	6,590	5,196	2,714	2,376	4,183	8,100	2,659	8,898	3,801
Misc fish	101.3	89.8	157.9	148.5	201.7	120.2	134.9	172.0	326.0	157.0
Eulachon	2.5	19.3	9.2	93.9	101.9	2.4	5.4	0.7	3.3	0.8
Sea star	89.4	7.2	9.5	11.4	5.2	18.8	9.8	13.2	37.3	9.4
Eelpouts	7.0	0.7	1.3	21.1	118.9	8.9	4.4	2.1	1.3	1.2
Giant Grenadier	0.3	4.1	5.0	6.9	16.8	23.8	4.3	4.1	1.7	2.0
Grenadier	20.4	10.1	9.0	8.8	10.9	4.1	0.7	0.6	0.3	0.0
Osmerids	7.5	2.0	3.4	5.6	37.9	2.0	0.1	0.1	0.3	0.1
Sea pens	0.6	1.0	1.7	2.0	4.0	1.1	2.6	3.1	2.9	3.9
Lanternfish	0.3	0.1	0.6	9.6	5.9	1.5	0.4	0.0	0.0	0.1
Snails	1.3	1.0	6.9	0.2	0.5	1.9	1.5	1.4	1.4	1.4
Sponge unid.	0.1	0.0	0.0	0.0	1.4	0.2	0.5	4.9	3.9	1.8
Sea anemone	0.4	0.4	0.3	0.6	0.3	0.9	1.3	2.4	2.0	2.1
Brittle star unidentified	0.3	0.0	0.0	2.7	0.2	3.6	0.1	0.3	0.2	0.1
urochordata	0.0	0.0	0.5	0.0	0.0	0.8	0.7	3.1	0.9	0.1
Unid. Inverts	0.0	0.1	0.1	0.2	0.7	0.3	0.3	1.0	0.7	2.2
Pandalids	0.0	0.0	0.5	0.8	1.1	0.9	0.3	0.5	0.2	0.1
Capelin	0.0	0.3	0.3	2.5	0.9	0.0	0.2	0.0	0.1	0.1
All other	0.9	0.3	0.8	0.3	3.3	1.5	1.1	1.5	1.6	0.6

The catch of other target species in the pollock fishery represent less than 1% of the total pollock catch. The bycatch of pollock in *other* target fisheries is almost double the bycatch of target species in the pollock fishery.

Table 23. Bycatch estimates (t) of other target species caught in the BSAI directed pollock fishery, 1997-2011 based on then NMFS Alaska Regional Office reports from observers (*2011 data are preliminary*). Note that the increase in 2011 is partially due to earlier non-target species being moved into the FMP as "target" species (e.g., skates, squid, octopus etc).

	Pacific Cod	Flathead Sole	Rock Sole	Yellowfin Sole	Arrowtooth Flounder	Pacific Ocean Perch	Atka Mackerel	Sablefish	Greenland Turbot	Alaska Plaice	Alaska skate	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	2,009	2,554	755	557	394	1,053	17	18	8		120	14,100
2005	7,413	2,319	1,125	725	651	653	678	11	31	45		125	13,145
2006	7,291	2,837	1,361	1,304	1,089	737	789	9	65	11		152	14,612
2007	5,630	4,203	510	1,282	2,795	625	315	12	107	3		188	14,494
2008	6,969	4,288	2,125	2,708	1,712	336	20	5	85	49		39	15,205
2009	7,878	4,602	7,602	3,818	2,203	114	25	3	44	176		25	22,861
2010	6,987	4,309	2,330	646	1,502	231	57	2	26	126	1,234	1,579	19,111
2011	9,998	4,846	8,463	1,443	1,599	659	891	1	29	74	881	2,492	29,973
2012	9,998	3,904	6,809	1,468	615	700	263	1	52	125	515	641	25,091
Average	6,615	2,998	2,744	1,244	1,155	485	341	12	64	53	877	527	15,730

Group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Skates	462	841	732	1,308	1,287	2,758	3,856	1,886	2,348	1,985
Squid	952	977	1,150	1,399	1,169	1,452	209	277	178	479
Sharks	191	187	169	512	246	146	100	26	132	55
Sculpins	92	150	131	169	190	283	292	258	315	283
Octopus	9	3	1	2	4	4	5	4	9	3

Table 24. Bycatch estimates (t) of pollock caught in the other non-pollock EBS directed fisheries, 2003-2011 based on then NMFS Alaska Regional Office reports from observers (*2012 data are preliminary*).

Target fishery	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg.
Pacific cod fishery	16,022	18,610	14,105	15,147	20,296	9,516	7,879	6,416	8,966	7,734	12,469
Yellowfin sole fishery	11,570	10,479	10,312	5,967	4,042	9,867	6,998	5,207	8,694	8,690	8,183
Rock sole fishery	4,925	8,964	7,240	7,040	3,220	4,995	6,150	5,913	7,091	6,769	6,231
Flathead sole fishery	2,989	5,112	3,664	2,641	3,448	4,098	3,166	3,072	1,491	886	3,057
Other flatfish	304	605	262	53	320	7	20	6	2	15	159
Other fisheries	653	826	1,353	1,244	880	725	340	407	1,130	903	846
Total from other fisheries	36,462	44,595	36,936	32,091	32,205	29,208	24,553	21,021	27,375	24,997	30,944

The catch of prohibited species was variable but showed noticeable trends. The high catches of "other salmon" (mainly comprising chum salmon) in 2011, were drastically lowered in 2012 due to better management and cleaner fishing by industry. The 2012 totals for most PSC species were lower than 2011, with the exception of Opilio crab and herring.

Table 25. Bycatch estimates of prohibited species caught in the BSAI directed pollock fishery, 1997-2012 based on then AKFIN (NMFS Regional Office) reports from observers. Herring and halibut units are in t, all others represent numbers of individuals caught. Preliminary 2012 data are through October 31st, 2012.

Year	Bairdi Crab	Blue King Crab	Chinook Salmon	Golden King Crab	Halibut catch	Halibut Mort	Herring	Non-Chinook Salmon	Opilio Crab	Other King Crab	Red King Crab
1991	1,398,107		39,054		2,156		3,159	28,709	4,380,023	33,346	17,777
1992	1,500,765		33,672		2,220		647	40,187	4,569,662	20,385	43,874
1993	1,649,103		36,619		1,326		527	241,980	738,259	1,926	58,140
1994	371,214		31,890		963	689	1,627	92,011	811,734	514	42,361
1995	153,993		13,403		492	397	905	17,755	206,651	941	4,644
1996	89,416		55,472		382	321	1,242	77,174	63,398	215	5,934
1997	17,046		44,320		257	200	1,135	65,415	216,152	393	137
1998	57,037		51,244		353	278	801	60,677	123,401	5,093	14,287
1999	2,397		10,381		154	125	800	44,610	15,830	7	91
2000	1,485		4,242		110	91	483	56,867	6,481	121	
2001	5,061		30,937		243	200	225	53,904	5,653	5,139	106
2002	2,113		32,402		199	168	109	77,178	2,698	194	17
2003	733	9	43,021	0	113	96	909	180,782	609		52
2004	1,189	4	51,700	2	109	93	1,104	440,477	743		27
2005	659	0	67,319	1	147	113	610	704,569	2,300		0
2006	1,666	0	82,596	3	156	122	436	309,642	2,947		203
2007	1,519	0	122,262	3	358	290	354	93,167	3,214		8
2008	8,888	8	21,358	33	425	333	128	15,420	9,573		576
2009	6,113	20	12,568	0	598	459	65	46,777	7,425		1,137
2010	13,531	29	9,796	0	355	272	351	13,806	9,439		1,009
2011	10,319	20	25,499	0	509	382	377	193,555	6,332		577
2012	3,650	0	10,157	0	456	369	2,357	21,945	16,508		292

Salmon bycatch

Chinook salmon

In 2011, the Council implemented a new Chinook salmon bycatch avoidance program for the Bering Sea pollock fishery, which includes:

• A hard cap on the number of Chinook salmon that can be taken in the Bering Sea pollock fishery. This maximum limit requires immediate closure to all further pollock fishing for the remaining season.

• Incentive plan agreements to keep bycatch lower than the cap level. These agreements include explicit incentives and penalties for the pollock fleet to avoid Chinook salmon in all conditions.

• An industry program to close areas of the pollock fishing grounds when Chinook salmon bycatch rates are high in those areas.

• Requirements for every pollock vessel to have at least one observer onboard at all times. It requires a full count of all salmon caught, with genetic sampling to determine stock of origin.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/Bycatchflyer913.pdf

There are three tools that the pollock fleets use to limit the amount of Chinook salmon that are bycatch in the directed pollock fishery. These are: **(1)** Hot Spot location which is the current location of high salmon bycatch being experienced by each vessel, this information is transmitted electronically to the fleet; **(2)** fishing within the time periods when Chinook salmon are not present; and **(3)** using Chinook salmon excluder devices in their trawl nets. It is the combination of all three of these approaches that have helped reduce salmon bycatch. When vessels fish during the periods that Chinook salmon are present, the use of Hot Spot location information and the use of excluder devices becomes very important. All of the full time inshore pollock catcher vessels use Hot Spot location information and most have salmon excluders and use them during peak periods of salmon

presence. Small vessels, with small quota will often not fish during the period when Chinook salmon are known to be present.

Chum salmon

Previously bycatch has been managed using time and area closures based upon historical bycatch trends. Currently the fleet is exempt from the chum salmon savings area closure provided it participates in a rolling hot spot (RHS) program which uses real-time data to move the fleet off areas of high bycatch weekly. The alternatives under consideration by the NPFMC include new time and area closures, PSC hard caps and RHS regulations. Information on the development of these alternatives, past amendment analyses and draft analyses for new measures are included at the NPFMC website (http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/BSChumBycatch.html).

At the October, 2013 NPFMC meeting the Council requested a discussion paper that evaluates the regulatory changes needed to incorporate Bering Sea chum salmon bycatch avoidance into the Chinook salmon Incentive Plan Agreements (IPAs). The objectives of this action are to prioritize Chinook salmon bycatch avoidance, while preventing high chum salmon bycatch and focusing on avoidance of Alaska chum salmon stocks, and allowing flexibility to harvest pollock in times and places that best support those goals. The paper should include an evaluation of the necessary changes to the IPA objectives and reporting requirements in regulation, and identify both the effects of such a change and whether there are elements of a rolling hotspot system (RHS) that the Council should consider retaining or adding to the regulations that define IPA requirements (such as, institutionalizing fleet-wide information sharing; requiring an RHS within the IPA; establishing an adjustable floor on the base rate, etc).

The Council requests the discussion paper also evaluate possible measures to refine Chinook salmon bycatch controls in the Bering Sea pollock fisheries. These include:

1) Requiring modification of IPAs to include restrictions or penalties targeted at vessels that consistently have the highest Chinook salmon PSC rates relative to other vessels fishing at the same time.

2) Requiring use of salmon excluder devices at times of year in which Chinook salmon encounter rates are relatively high (regulatory or through IPAs).

3) Requiring a lower base rate beginning September 1 (regulatory or through IPAs).

4) Provisions to shorten the pollock season to end when pollock catch rates significantly decline and Chinook salmon PSC rates increase in October (regulatory or through IPAs).

5) Closing the fishery to a sector (or cooperative) if the sector's (or cooperative's) weekly Chinook salmon PSC rate exceeds a specified rate in September and/or October (regulatory or through IPAs).

6) Changing the accounting of the Chinook salmon PSC limit to begin with:

a. the start of the pollock B season (June 10) and continue through the A season of the subsequent year;

b. October 1 and continue through September 30th of the subsequent year; and

c. September 1 and continue through August 31st of the subsequent year.

This evaluation should also include information on potential revisions to the annual reporting requirements, combined for chum and Chinook salmon measures, based on suggestions in the Council's October staff report, such as, frequency of excluder use, variability in individual vessel

bycatch rates over the season and years, and numbers and rates of bycatch by month.

Steller sea lions

NMFS uses Steller sea lion protection measures (SSLPM) 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 current protection measures were put into effect in January 2011, and in April 2012 NOAA Fisheries requested public input in preparation for an environmental impact statement (EIS) on SSLPM for the Bering Sea and Aleutian Islands management area groundfish fisheries. To inform the Council and the public of the results of scoping and to assist in the development of the range of alternatives and analysis for the EIS, in November 2012, NMFS provided the Council with a scoping report that summarized the issues associated with the proposed action and described alternative protection measures raised in public comments during the scoping process. In December 2012, the Council recommended alternatives for NMFS to consider in the development of the reasonable range of alternatives for analysis in the EIS. In April 2013, the Council and its Scientific and Statistical Committee (SSC) reviewed the preliminary draft EIS and identified a preliminary preferred alternative for the public review of the draft EIS. In May 2013, NMFS issued the Steller Sea Lion Protection Measures for Groundfish Fisheries in the Bering Sea and Aleutian Islands Management Area Draft Environmental Impact Statement/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (DEIS). The 60-day public comment period on the DEIS ended on July 16, 2013. A comment analysis report of the public comments received regarding the EIS statement on SSLPM and the responses provided by the Alaska Regional Office of NOAA was presented at the October, 2013 NPFMC meeting.

For pollock fisheries, current SSLPM take the form of a number of no-trawl areas throughout the Bering Sea, Aleutian Islands and Gulf of Alaska, the EIS offers five alternatives.

Alternative 1: Status quo, 2011 Steller Sea Lion Protection Measures (Interim Final Rule)
Alternative 2: Modified 2011 Steller Sea Lion Protection Measures
Alternative 3: Further Modified 2011 Steller Sea Lion Protection Measures
Alternative 4: Modified 2010 Steller Sea Lion Protection Measures
Alternative 5: Preliminary Preferred Alternative

Bering Sea Canyons Discussion

Some of the largest submarine canyons in the world incise the eastern Bering Sea shelf break, including Bering, Pribilof, Zhemchug, Pervenets and Navarin canyons. In 2012, the NPFMC received testimony from environmental organizations to protect coral, sponge and other benthic habitat of fish and crab species in two of these canyons (Pribilof and Zhemchug). In response to this testimony, the NPFMC requested that the NOAA AFSC analyze the distribution of fishes and benthic invertebrates and the vulnerability of their habitat to fishing activities. AFSC compiled data from the eastern Bering Sea that included trawl survey data on fish and invertebrate distributions and observations of ocean conditions and benthic habitat. These data were analyzed using multivariate techniques to determine if the two canyons are distinguishable from the adjacent continental slope. The potential for fishing effects on coral and sponge was assessed with spatial modeling of historical fishing effort, coral and sponge distributions and an index of their vulnerability to physical damage. Pribilof and Zhemchug canyons do show some distinguishing physical characteristics from the

adjacent slope such as lower oxygen and pH and higher turbidity, but none based on biological characteristics (i.e., fish, coral and sponge distributions). These analyses imply that Pribilof and Zhemchug canyons are not biologically unique. Instead the major variables structuring the communities of fish and invertebrates on the eastern Bering Sea slope appear to be depth and latitude rather than submarine canyons. Corals were predicted to occur predominantly along the eastern Bering Sea slope, whereas sea whips were predicted to occur predominantly along the outer continental shelf. Sponges were mixed, with about two-thirds of their habitat predicted for the outer shelf and the remainder for the slope. One unique feature of the focal canyons is that about one third of the coral habitat predicted for the eastern Bering Sea slope occurs in Pribilof Canyon, an area that comprises only about 10% of the total slope area. Although apparently concentrated there, the average density of coral for Pribilof Canyon (0.28 colonies m^{-2}) is much less than the density for the Aleutian Islands (1.23 colonies m^{-2}). The physical and biological characteristics of Zhemchug and Pribilof canyons are spatially heterogeneous; coral habitat was more common in some sections of Pribilof Canyon. Higher vulnerability indices were found both within and between canyons and were not unique to Pribilof and Zhemchug canyons. Pelagic trawl, longline and pot gear but not bottom trawl gear overlapped some coral and sponge habitats of the slope including canyons. Substantial overlap does not explain whether effects of fishing were light, medium or high, just that effects likely were greater in overlap areas compared to other areas. Further, the effect for the pelagic trawl fishery will depend on how often and where fishing occurs on bottom habitats.
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/conservation_issues/BSHC/BeringSeaCanyons_a_513.pdf

In response to the study, in June 2013, the NPFMC drafted a motion regarding Bering Sea canyon areas to identify and validate where necessary areas of coral concentrations for possible management measures occur, for the conservation and management of deep sea corals in Pribilof and Zhemchug canyons. Specifically they requested:

- The AFSC to expand upon the initial analysis to include an overlay of model results with existing data such as: visual survey data, observer data, longline survey data, multibeam sonar data and to incorporate a biodiversity index and rare species analysis.
- Task staff to initiate a discussion paper that addresses management measures to be considered for conserving areas of coral concentrations and associated fish productivity. Staff should meet with AFSC and stakeholders to discuss possibilities for collaboration in order to survey areas of coral abundance as well as to identify and develop tools for coral impact reduction and to bring a report of that meeting back to the council at the October or December meeting.
- Draft a letter to the Deep Sea Coral Research and Technology Program (DSCRTP) requesting that further research be done to identify and characterize areas of relatively high coral abundance in the in the Bering Sea slope canyon areas and to support the process of improving the AFSC model predictions and vulnerability index using camera drops or similar techniques capable of gathering empirical data. Request that this research be used to inform longer term research priorities including: refining predictions of coral presence, acquiring information on the characteristics of coral in this area such as height and density, the role of these coral as habitat for fish, and documenting presence and degree of fishing gear effects.

AI Pollock Ecosystem considerations
Ecosystem effects on Aleutian Islands Walleye Pollock

Prey availability/abundance trends
Adult walleye pollock in the Aleutian Islands consume a variety of prey, primarily large zooplankton, copepods, and myctophids. No time series of information is available on Aleutian Islands for large zooplankton, copepod, or myctophid abundance.

Predator population trends
The abundance trend of Aleutian Islands Pacific cod is decreasing, and the trend for Aleutian Islands arrowtooth flounder is relatively stable. Northern fur seals and Steller sea lions west of 178°W longitude are showing declines, while Steller sea lions east of 178°W longitude have shown some slight increases. Declining trends in predator abundance could lead to possible decreases in walleye pollock mortality. The population trends of seabirds are mixed, some increasing, some decreasing, and others stable. Seabird population trends could affect young-of-the-year mortality.

Changes in habitat quality
The 2012 Aleutian Islands summer bottom temperatures indicated that water temperatures were cooler than the 2002-2010 surveys (Lowe et. al. 2012). Bottom temperatures could possibly affect fish distribution, but there have been no directed studies, and there is no time series of data which demonstrates the effects on Aleutian Islands walleye pollock.

AI pollock fishery effects on the ecosystem

AI pollock fishery contribution to bycatch. There was no directed pollock fishery in the Aleutians in 2011 or 2012.

Concentration of AI pollock catches in time and space
Since no EFP is proposed for 2013 there is expected to only be a very limited fishery in 2013, if any at all. The only shore-based plant capable of processing the Aleutian Islands' pollock catch in Adak is currently not configured to do so and no pollock processing is expected there in 2013.

AI pollock fishery effects on amount of large size walleye pollock
The AI pollock fishery in the Aleutian Islands was closed between 1999 and 2005. There was only a very limited fishery in 2005 (< 200t), 2006 (932 t), 2007 (1,300 t), 2008 (382 t), 2009 (400 t), 2010 (50 t), 2011 (0 t) and 2012 (0 t). Year to year differences observed in the previous decade cannot be attributed to the fishery and must be attributed to natural fluctuations in recruitment. Fishers have indicated that the larger pollock in the Aleutian Islands will be targeted. But the low level of fishing mortality is not expected to greatly affect the size distribution of pollock in the AI.

AI pollock fishery contribution to discards and offal production
The 2013 Aleutian Islands pollock fishery, if pursued, is expected to be conducted by catcher vessels delivering unsorted catch to the processing plant in Adak, and therefore very little discard or offal production is expected from this fishery. Currently the plant is out of operation and therefore no fishery is expected.

AI Pollock fishery effects on AI pollock age-at-maturity and fecundity
The effects of the fishery on the age-at-maturity and fecundity of AI pollock are unknown. No studies

on AI pollock age-at-maturity or fecundity have been conducted. Studies are needed to determine if there have been changes over time and whether changes could be attributed to the fishery. Little impact is expected if the fishery continues to be conducted in the limited capacity it has been over.

Table 26. Ecosystem effects on AI walleye pollock.

Indicator	Observation	Interpretation	Evaluation
Prey availability or abundance trends			
Zooplankton	Stomach contents, ichthyoplankton surveys	None	Unknown
Predator population trends			
Marine mammals	Fur seals declining, Steller sea lions increasing slightly in central, decreasing in West.	Possibly lower mortality on walleye pollock	No concern
Birds	Stable, some increasing some decreasing	May affect young-of-year mortality	Unknown
Fish (Pacific cod, arrowtooth flounder)	Pacific cod—decreasing, arrowtooth--stable	Possible decreases to walleye pollock mortality	No concern
Changes in habitat quality			
Temperature regime	The 2012 AI summer bottom temperature was colder than average	Cooling could affect apparent distribution.	Unknown
The AI walleye pollock effects on ecosystem			
Indicator	Observation	Interpretation	Evaluation
Fishery contribution to bycatch			
Prohibited species	Expected to be heavily monitored	Likely to be a minor contribution to mortality	No concern
Forage (including herring, Atka mackerel, cod, and pollock)	Expected to be heavily monitored.	Bycatch levels should be low.	Unknown
HAPC biota (seapens/whips, corals, sponges, anemones)	Very low bycatch levels of seapens/whips, sponge and coral catches expected in the pelagic fishery	Bycatch levels and destruction of benthic habitat expected to be minor given the pelagic fishery.	No concern
Marine mammals and birds	Very minor direct-take expected	Likely to be very minor contribution to mortality	No concern
Sensitive non-target species	Expected to be heavily monitored	Unknown given that this fishery was closed between 1999 and 2005. The 2006 AICASS had 3% POP bycatch, the only significant bycatch. The 2005-2009 fishery had high bycatch of POP, but bycatch of other species was very low in fishery prior to 1999.	No concern
Other non-target species	Very little bycatch.	Unknown	No concern
Fishery concentration in space and time	Steller sea lion protection measures may concentrate fishery spatially to very small areas between 20 nm closures	Depending on concentration of pollock outside of critical habitat could possibly have an effect.	Possible concern
Fishery effects on amount of large size target fish	Depends on highly variable year-class strength	Natural fluctuation	Possible Concern
Fishery contribution to discards and offal production	Offal production—unknown. 2013 fishery not expected to be significant.	Unknown	Unknown
Fishery effects on age-at-maturity and fecundity	Unknown	Unknown	Unknown

Bogoslof pollock ecosystem considerations

In general, a number of key issues for ecosystem conservation and management can be highlighted. These include:

- Preventing overfishing;

- Avoiding habitat degradation;
- Minimizing incidental bycatch (via multi-species analyses of technical interactions);
- Controlling the level of discards; and
- Considering multi-species trophic interactions relative to harvest policies.

For the case of pollock, the NPFMC and NMFS continue to manage the fishery on the basis of these issues in addition to the single-species harvest approach. The prevention of overfishing is clearly set out as a main guideline for management. Habitat degradation has been minimized in the pollock fishery by converting the industry to pelagic-gear only. Bycatch in the pollock fleet is closely monitored by the NMFS observer program, and individual species caught incidentally are managed on that basis. Discarding rates have been greatly reduced in this fishery and multi-species interactions is an ongoing research project within NMFS with extensive food-habit studies and simulation analyses to evaluate a number of "what if" scenarios with multi-species interactions.

Research priorities

The 2012 EBS SAFE report identified the following areas of research which would be useful for improving ecosystem-based stock management:

1) age determination protocols as identified by the CIE review
2) spatial distribution of pollock by season including vertical dimension and how this impacts the availability of pollock to survey gear
3) the relationship between climate and recruitment
4) stock structure potential
5) trophic interactions of pollock within the ecosystem

Habitat effects of the fishery

To incorporate the regulatory guidelines for review and revision of essential fish habitat (EFH) FMP components, the NPFMC will conduct a complete review of all the EFH components of each FMP once every 5 years and will amend those EFH components as appropriate to include new information. Additionally, the NPFMC may use the FMP amendment cycle every three years to solicit proposals for habitat areas of particular concern and/or conservation and enhancement measures to minimize the potential adverse effects from fishing. Those proposals that the NPFMC endorses would be implemented through FMP amendments. In 2010, during the last EFH review, the pelagic trawl pollock fishery was determined to not have significant essential fish habitat impacts on spawning and breeding, feeding or growth to maturity of pollock with the negative effects determined to be either minimal or temporary.
http://www.fakr.noaa.gov/habitat/efh/review/appx1.pdf

Work has already begun on the 2015 5-year review with the idea of increasing the accuracy of EFH data and maps (NOAA Alaska Region Habitat Office presentation at the September, 2013 Groundfish Plan Team meeting).

Endangered, Threatened, Protected species

Over the last 12 months, the assessment team has found no significant interactions with endangered species and the pollock fishery, including whales, sea lions or seabirds that evidence is available for.

Broader ecosystem considerations

The AFSC also produces an annual ecosystem considerations report as an appendix to the SAFE reports and covering all Alaskan groundfish fisheries.

The 2012 Ecosystem SAFE summarizes the following information for fishing and fisheries trends.

Alaska wide

- With the Arctic FMP closure included, almost 65% of the U.S. EEZ of Alaska is closed to bottom trawling (p. 195).
- At present, no BSAI or GOA groundfish stock or stock complex is overfished and no BSAI or GOA groundfish stock or stock complex is being subjected to overfishing. The Pribilof Island blue king crab stock is only stock considered overfished. This stock is on a continuing rebuilding plan (year 9 of 10-year plan). The status of the Bering Sea snow crab rebuilding program has changed from rebuilding to rebuilt (p. 198).

Bering Sea

- Discarded tons of groundfish continued a long term decreasing trend in 2011, while the discard rate dropped to 3% (p. 190).
- Non-specified catch comprised the majority of non-target catch during 1997-2011. The catch of non-specified species has decreased overall since the late 1990s. HAPC biota catch has generally decreased since 2004. The catch of forage species increased in 2011, primarily due to capelin and eulachon (p. 190).

Aleutian Islands

- Discard rates have declined over the past eight years. Discards and discard rates are much lower now than they were in 1996 (p. 190).
- Non-specified catch comprised the majority of non-target catch during 1997-2011. The non-specified catch dropped in 2010-2011, primarily due to a reduction in the catch of giant grenadiers. HAPC catch has been variable over time in the AI and is driven primarily by sponges caught in the trawl fisheries for Atka mackerel, rockfish and cod. Forage fish catches in the AI are minimal (p. 190).

Gulf of Alaska

- Discard rates in the Gulf of Alaska have varied over time but were lower than average in 2010 and 2011 (p. 190).
- Non-specified catch comprised the majority of non-target catch during 1997-2011. The catch of non-specified species in the GOA has been generally consistent aside from a peak in 1998 and lows in 2009 and 2010. The catch of forage species increased in 2010-2011, primarily due to eulachon and other osmerids (p. 190).

Evidence

http://www.adfg.alaska.gov/static/home/news/pdfs/newsreleases/cf/241416353.pdf
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/BSChinookBycatch.html
http://alaskafisheries.noaa.gov/npfmc/bycatch-controls/GOA-salmon-bycatch.html
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/GOAChinookBycatchMotion611.pdf
http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/bycatch/GOAchinookbycatch112.pdf
http://alaskafisheries.noaa.gov/sustainablefisheries/sslpm/

http://alaskafisheries.noaa.gov/rr/tables/tabl4.pdf
http://www.alaskadispatch.com/article/steller-sea-lions-judge-keeps-aleutian-fishing-restrictions-place
http://www.afsc.noaa.gov/REFM/Docs/2012/EBSpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/GOApollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/AIpollock.pdf
http://www.afsc.noaa.gov/REFM/Docs/2012/BOGpollock.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/BSAI/BSAIfmp613.pdf
https://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/GOA/GOAfmp613.pdf
http://access.afsc.noaa.gov/reem/ecoweb/eco2012reportcardEBS.pdf
http://access.afsc.noaa.gov/reem/ecoweb/eco2012reportcardAI.pdf
http://www.afsc.noaa.gov/REFM/docs/2012/ecosystem.pdf
http://access.afsc.noaa.gov/reem/ecoweb/index.cfm

14. Where fisheries enhancement is utilized, environmental assessment and monitoring shall consider genetic diversity and ecosystem integrity.

FAO CCRF 9.1.2/9.1.3/9.1.4/9.1.5/9.3.1/9.3.5

Evidence adequacy rating:

☐ **High** ☐ **Medium** ☐ **Low**

Clause 14 is not applicable for this fishery.

8. Performance specific to agreed corrective action plans

Not Applicable. Non non conformances are active for this fishery.

9. Unclosed, new non conformances and new corrective action plans

Not applicable, no new non conformances have been issued.

10. Future Surveillance Actions

The assessment team will review the following during the 2014 surveillance assessment: 1) Review of potential re-instatement of the Alaska Coastal Management Plan and 2) Developments, coverage and data produced by the restructured observer program.

11. Client signed acceptance of the action plan

Not applicable.

12. Recommendation and Determination

Following this Second surveillance assessment, finalized in February 2013, the assessment team recommends that continued Certification under the FAO-Based Responsible Fisheries Management Certification Program is maintained for the management system of the applicant fishery, the Alaska pollock, *Gadus chalcogrammus,* (formerly *Theragra chalcogramma*) commercial fisheries employing pelagic trawl gear within Alaska jurisdiction (200 nautical miles EEZ) and subjected to federal [National Marine Fisheries Service (NMFS)/North Pacific Fishery Management Council (NPFMC)] and state [Alaska Department of Fish and Game (ADFG) & Board of Fisheries (BOF)] management.

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Appendix 1

Assessment Team Details

Rick Stanley (Assessor)

Rick Stanley received a M.Sc. in Zoology from the University of British Columbia in 1977. Following work on overseas fisheries projects in Indonesia (1978) and El Salvador (1979), he worked for the Department of Fisheries and Oceans Canada (DFO) as a research biologist at the Pacific Biological Station in Nanaimo Canada until August 2013. During those years with DFO, he was senior author or co-author of 19 peer-reviewed stock assessments on British Columbia populations of various species of rockfishes (Sebastes spp.). He also served on the working groups and review committees of assessment on many other species of groundfish and invertebrates. In addition to stock assessment activity, he has published primary papers on the general biology of rockfishes including papers on ageing, parasites and reproductive biology, as well acoustic biomass estimation. An additional focus of Mr. Stanley's work at DFO was the development of fishery catch monitoring programs and bottom trawl surveys for groundfish. Following his retirement from DFO in August 2013, Mr. Stanley began work as a self-employed fisheries consultant.

Dr. Geraldine Criquet (Assessor)

Géraldine Criquet holds a PhD in Marine Ecology (École Pratique des Hautes Études, France) which focused on coral reef fisheries management, Marine Protected Areas and fish ecology. She has also been involved during 2 years in stock assessments of pelagic resources in the Biscay Gulf, collaborating with IFREMER. She worked 2 years for the Institut de Recherche pour le Développement (IRD) at Reunion Island for studying fish target species growth and connectivity between fish populations in the Indian Ocean using otolith analysis. She served as Consultant for FAO on a Mediterranean Fisheries Program (COPEMED) and developed and implemented during 2 years a monitoring program of catches and fishing effort in the Marine Natural Reserve of Cerbere---Banyuls (France). Geraldine has joined Global Trust Certification in August 2012 as a Fisheries Assessment Officer and is involved in FAO RFM and MSC fisheries assessments.

Erica Fruh (Assessor)

Erica Fruh has been involved in commercial fisheries management for over 15 years. She earned her BSc in Marine Biology from Auburn University, and her MSc in Marine Resource Management from Oregon State University. Her MSc project focused on bycatch in trawl and longline fisheries. Previous experience includes fishery biologist roles with the Oregon Department of Fish and Wildlife, the Pacific States Marine Fisheries Commission and NOAA Fisheries. She has worked with most fishing gear types used along the U.S. west coast, spending numerous days at sea participating in tagging studies, population monitoring, bycatch monitoring and fishing mortality studies. She worked as a commercial fisheries observer in the U.S. west coast groundfish trawl fishery, the Oregon pink shrimp fishery and the seine sardine fishery. She spent 10 years contributing to the National Marine Fisheries Service U.S. west coast groundfish bottom trawl survey gathering data for stock

assessments, and leading projects on marine debris, seabird sightings and age structure collection. She serves on the Board of Directors for the Newport Fishermen's Wives organization to promote safety at sea.

Vito Ciccia Romito (Lead Assessor)

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 commercial salmon, halibut, sablefish, pollock, BSAI King and snow crab Pacific cod and flatfish fisheries, as well as the Icelandic cod, saithe, haddock and redfish fisheries. Vito is also a lead, third party IRCA approved auditor.